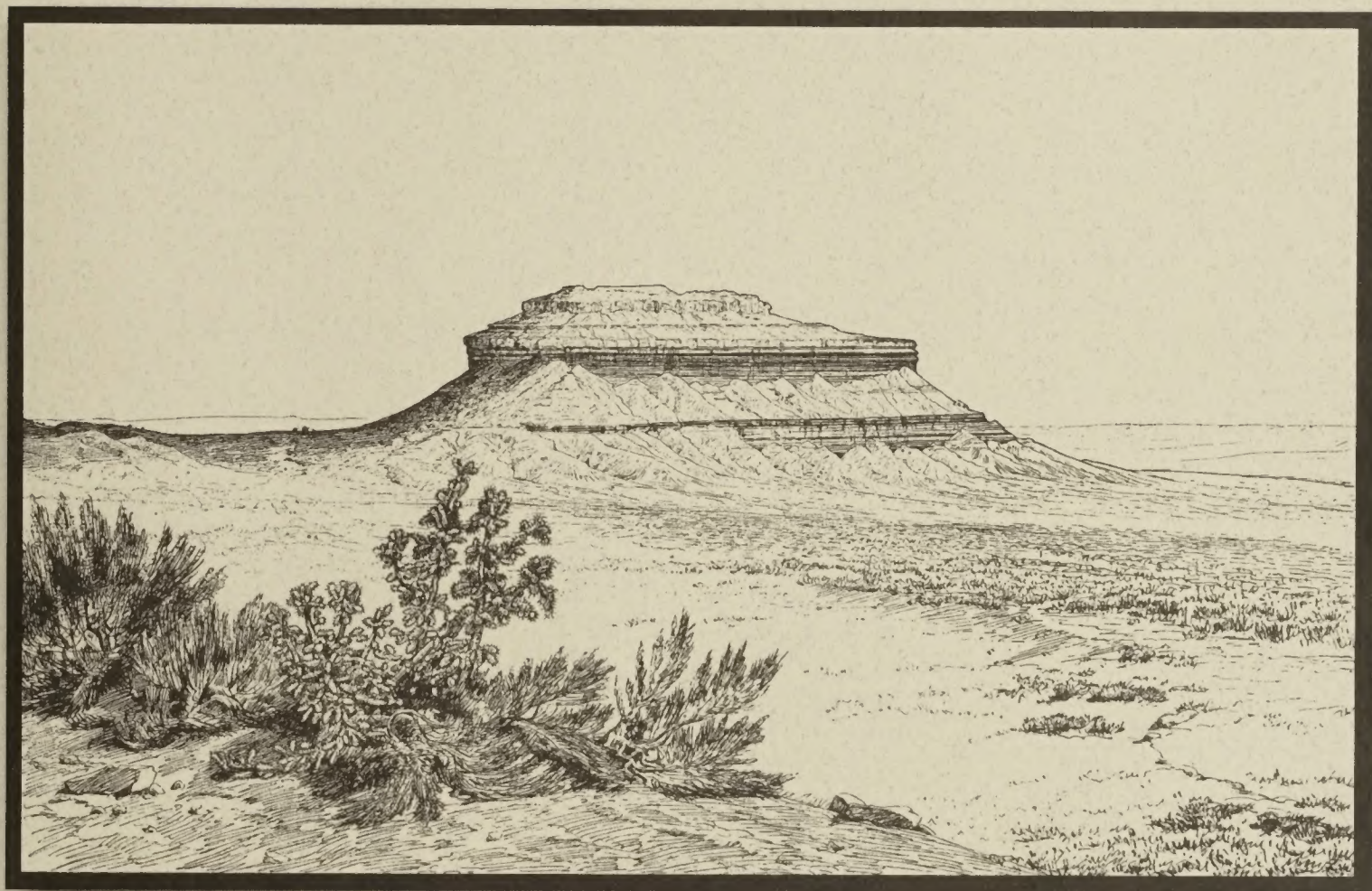




Draft Resource Management Plan/Draft EIS
for the Arizona Strip Field Office,
the Vermilion Cliffs National Monument,
and the BLM Portion of Grand Canyon-Parashant National Monument,
and a Draft General Management Plan/Draft EIS for the
NPS Portion of the Grand Canyon-Parashant National Monument

Volume 2



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Arizona Strip District, Bureau of Land Management
Lake Mead National Recreation Area, National Park Service



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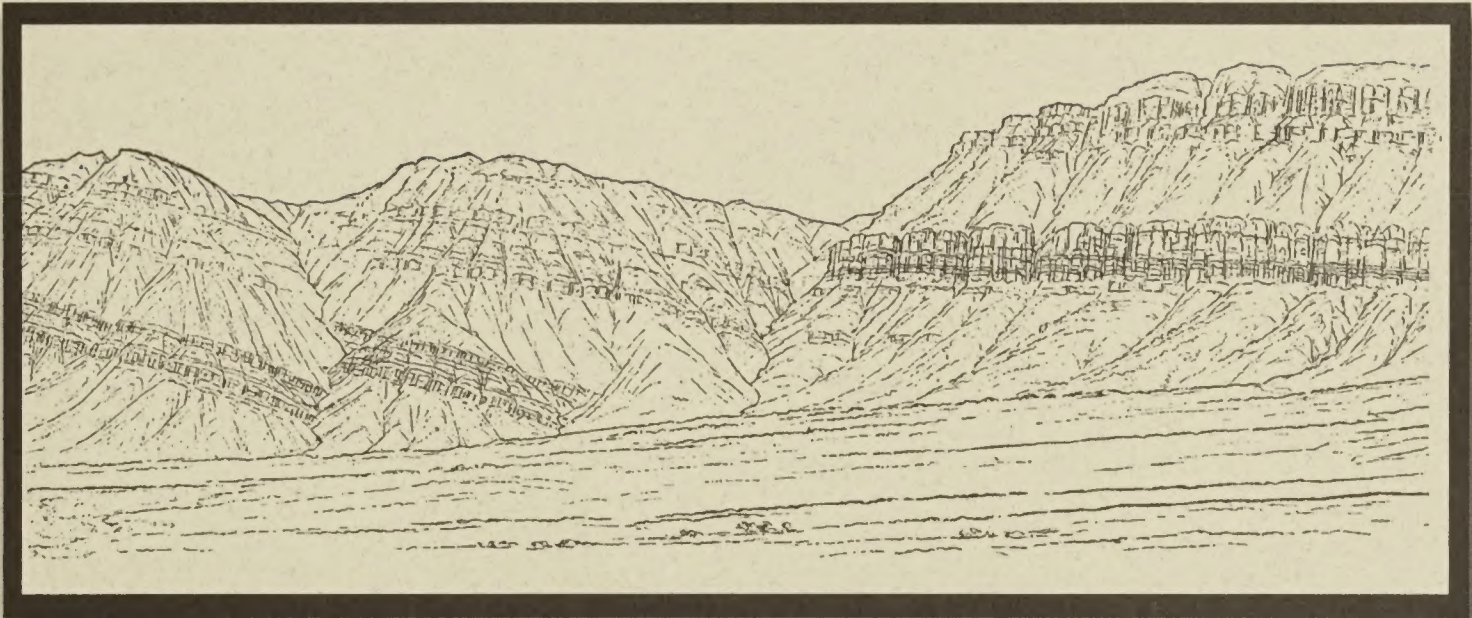
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Chapter 4

Environmental Impacts



“Something’s gotta happen to keep it the same.”

Kelly Heaton, 2002

CHAPTER 4. ENVIRONMENTAL IMPACTS

INTRODUCTION

This chapter describes the environmental consequences of implementing any of the five planning alternatives described in Chapter 2, including the No Action and Preferred Alternatives. It examines the potential impacts of the decisions that would be made under each resource program on each of the impact topics (i.e., resources, resource uses, special management areas, and social and economic conditions) described in Chapter 3. Impacts were analyzed with the mitigation measures outlined in Chapter 2 (within the alternative decision tables) in place. Any additional mitigation measures that could reduce or prevent major adverse impacts identified during the impact analysis are also identified in this chapter and in the appendices. A tabular summary of impacts can be found at the end of Chapter 2 (Table 2.19).

ANALYTICAL ASSUMPTIONS AND GUIDELINES

This document assesses the management actions proposed for implementing the proclamations for Parashant and Vermilion and legislation creating Lake Mead National Recreation Area (NRA). The analysis is bounded by decisions identified in the proclamations or in legislation and does not include alternatives to these decisions. These decisions are as follows;

- Certain uses would be restricted or limited by the proclamations, legislation, federal regulations, or agency policy.
- Ongoing reasonable access to state and private land or interests would be provided.
- Grazing, where currently permitted, would be continued.
- Hunting and fishing would be regulated by the State of Arizona, with the exception that the Secretary of the Interior, in consultation with the state, may take certain steps to regulate hunting in the Planning Area for reasons such as public safety and protection of resources.
- Decisions relating to land areas included in eight congressionally designated wilderness areas on Bureau of Land Management-administered public lands (BLM lands) and recommended areas for proposed wilderness on National Park Service-administered lands (NPS) would be upheld.
- Decisions relating to the proposed wild and scenic river designations for the Paria and Virgin rivers (BLM LEIS 1994) would be upheld.
- Old Spanish National Historic Trail (NHT) Congressional Designation (2002) would be recognized and decisions relating to the designation upheld.

The following general assumptions and guidelines were used to guide and direct the analysis of environmental impacts. Other assumptions specific to a particular impact topic are presented under that topic:

- The BLM and NPS would have sufficient funding and personnel to implement any of the alternatives as described in Chapter 2.
- Research would continue to be funded, dependent upon sufficient funding.
- Management of the Arizona Strip District including the Monuments would be consistent with existing laws, regulations, policies, and guidelines.
- The planning period for the analysis is the next 15 to 20 years.
- Recreation use in the Planning Area would continue to increase.
- Livestock grazing would continue to be governed by applicable laws and regulations.
- Specific actions to protect human life would be taken regardless of the management criteria in the plan alternatives.
- The discussion of impacts is based on the best available data. Knowledge of the Planning Area and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used to infer environmental impacts where data is limited.

INCOMPLETE OR UNAVAILABLE INFORMATION

As mandated by 43 Code of Federal Regulations (CFR) 1502.22, agencies evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS must identify incomplete or unavailable information, if that information is essential to a reasoned choice among alternatives. This Draft Plan/DEIS is based on the best available data for each impact topic. However, there are few detailed resource surveys and inventories for the Planning Area, limiting the amount of available data necessary for impact analysis. For example, most of the Planning Area has not been surveyed for cultural or paleontological resources, while water quality and visitor use information is very limited. In absence of such data, best professional judgment of BLM and NPS resource specialists at the Arizona Strip FO and in the Monuments and the NPS staff at Lake Mead NRA was used in the impact analysis.

TYPES OF IMPACTS

This chapter describes the direct, indirect, and cumulative impact of implementing the No Action Alternative and each of the four action alternatives. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by the action and occur later or farther away but are still reasonably foreseeable. Cumulative impacts are the effects on the environment that result from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. Cumulative impacts are briefly described at the end of the analysis for most impact topics, while a more detailed discussion is provided at the end of this chapter.

Impacts are also described as to their context, intensity, and duration. Context generally refers to the geographic extent of impact (localized or widespread). Impact intensity is the magnitude or degree to which a resource would be beneficially or adversely affected. The criteria that were

used to rate the intensity of the impact for each impact topic is presented later in this section under each impact topic heading. Impact duration refers to how long an impact would last. For the purposes of this Draft Plan/DEIS, the planning team considered impacts as either short term or long term to describe the duration of the impacts. Unless otherwise stated for any particular impact topic, short-term impacts would occur with five years of implementing the Plan, often during construction and recovery, while long-term impacts would occur beyond five years, often from operations.

NPS Impairment of Resources

In addition to determining the environmental consequences of the alternatives, NPS policy (NPS 2001: Management Policies, Section 1.4) requires that potential effects be analyzed to determine if a proposed action would impair the resources or values of the NPS unit, “including the opportunities that otherwise would be present for the enjoyment of those resources or values.”

Impairment analysis is required only for the NPS portion of Parashant. While the BLM is mandated by proclamation to protect the Monument objects, and thus avoid any adverse impacts that would otherwise “impair” such objects, the agency is not required to conduct impairment analysis. Consequently, a determination about impairment is made for the NPS portion of Parashant only. This impairment determination can be found in the conclusion of this chapter. A description of the impairment analysis legal framework and linkage to the National Environmental Policy Act (NEPA) is outlined in Appendix 4.C.

The fundamental purpose of the NPS, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve resources and values. NPS managers always must seek ways to avoid or minimize adverse impacts on the resources and values to the greatest degree practicable. However, the laws do give the NPS the management discretion to allow impacts on the resources and values when necessary and appropriate to fulfill the purposes of a unit (in this case, a national monument), as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS this management discretion, that discretion is limited by the statutory requirement that the NPS must leave the resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The impairment prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impacts; the direct and indirect effects of the impacts; and the cumulative effects of the impact in question and other impacts.

An impact on any resource or value may constitute an impairment. An impact would be most likely to constitute an impairment if it affects a resource or value whose conservation:

- a) is necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the Monument,
- b) is the key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or
- c) is identified as a goal in the Monument’s general management plan or other relevant NPS planning documents. An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot be reasonably further mitigated, or an action necessary to preserve or restore the integrity of Monument’s resources or values.

Impairment may occur from visitor activities, NPS activities in the course of managing a park, or activities undertaken by permittees, contractors or others operating in the park as well as from external actions. Impairment can occur from inaction as well as action. For example, failure to prevent the spread of seriously disruptive invasive species may impair park resources.

BLM AND NPS MANDATORY TOPICS

The BLM’s NEPA Handbook (H-1790-1) and NPS Director’s Order #2 (Park Planning) require that all EISs address certain topics, which the BLM refers to as Critical Elements of the Human Environment. The list of elements contained in the BLM handbook has been expanded by BLM Instruction Memoranda and Executive Orders. Further clarification of the required topics that need to be addressed is provided in the BLM Land Use Planning Handbook (BLM 2005). These impact topics are presented in Table 4.1 in the order they appear in Chapters 2, 3, and 4, followed by corresponding Critical Elements of the Human Environment and NPS mandatory topics.

Table 4.1: Mandatory EIS Topics		
Topics Addressed in this Draft Plan/DEIS (BLM Land Use Plan Handbook)	Critical Elements of the Human Environment (BLM NEPA Handbook)	NPS Mandatory Topic (Park Planning)
Resources		
Air	Air Quality	--
Water (includes water rights, surface water, ground water)	Water Quality, Drinking or Ground	--
Soils	--	--
Geology and Paleontology (including cave and karst resources)	--	--
Vegetation	Invasive, Nonnative Species; Wetlands/Riparian Zones	Wetlands and floodplains
Fire and Fuels Management	--	
Fish and Wildlife	--	
Special Status Species (includes both animals and plants)	Threatened or Endangered Species	Endangered or threatened plants and animals and their habitats (including

		those proposed for listing on other state lists)
Wild Burros	--	--
Cultural Resources (includes archaeological and historical and resources of traditional importance to American Indians)	American Indian Religious Concerns; Cultural Resources	Urban quality, historic and cultural resources, and design of the built environment; Important scientific, archeological, and other cultural resources including historic properties listed or eligible for the National Register of Historic Places (NRHP); American Indian sacred sites
Visual Resources (including night sky)	--	--
Soundscapes	--	--
Wilderness Characteristics	--	Ecologically critical areas, wild and scenic rivers or other unique natural resources
Resource Uses		
Vegetation Products		
Lands and Realty	Energy, including renewable	Energy Requirements and conservation potential
Livestock Grazing	--	--
Minerals	--	--
Recreation and Visitor Services/Interpretation and Environmental Education	--	--
Trails and Travel Management	--	--
Special Area Designations		
Congressional Designations (includes designated and NPS-proposed wilderness and wild and scenic rivers)	Wilderness; Wild and Scenic Rivers	Ecologically critical areas, wild and scenic rivers or other unique natural resources
Administrative Designations (includes Areas of Critical Environmental Concern (ACECs))	ACECs	Ecologically critical areas, wild and scenic rivers or other unique natural resources
Social and Economic Conditions		
Socioeconomics		
Environmental Justice	Environmental Justice	Socially or economically disadvantaged populations
Health and Safety (includes abandoned mines and hazardous materials)	Wastes, Hazardous or Solid	Public health and safety

Table 4.2 lists mandatory BLM and NPS that are not discussed further in this Draft Plan/DEIS because they do not occur within the Planning Area or, if they occur, would not be affected by the management direction being analyzed (see 40 CFR 1500.4).

Table 4.2: Topics Not Discussed in this Draft Plan/DEIS

BLM Mandatory Topics	NPS Mandatory Topics	Reason for Omission
Farm Lands, Prime or Unique	Prime and unique agricultural lands	No prime or unique farm or agricultural lands occur in the Planning Area
Floodplains	Floodplains	No projects or activities are proposed that would result in diversions in or placement of permanent facilities on active floodplains of major rivers. No 100 or 500-year floodplains of major rivers occur in the NPS portion of the Planning Area
Indian Trust Resources	Indian Trust Resources	No Indian trust resources would be impacted.

IMPACTS TO RESOURCES

AIR

Impacts to air quality come primarily from sources outside the Planning Area, such as regional haze, and are thus outside the scope of this Draft Plan/DEIS. However, short-term air quality effects could arise as a result of fugitive dust, and smoke that both directly and indirectly relate to proposed management actions. Main sources of fugitive dust include vehicle and equipment use on unpaved roads, road construction and maintenance activities, and mineral operations. Main sources of smoke arise from wildland and prescribed fires.

Methods and Assumptions

The analysis of potential impacts to air quality is based on the expertise of BLM resource specialists at the Arizona Strip FO and the NPS staff at Lake Mead NRA. Combined, these staff possess an extensive knowledge of air quality within the Planning Area. The impact analysis is also based on review of existing literature and information provided by non-planning team experts in the BLM, NPS, and other agencies.

Quantifying air quality effects is difficult due to the lack of air quality monitoring data for the Planning Area. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

Negligible: No changes to air quality would occur, or changes in air quality would be below or at the level of detection. If detected, the effects would be considered slight.

Minor: Changes to air quality would be measurable, although the changes would be small, short-term (less than seven consecutive days), and local. Mitigation measures would not be necessary.

Moderate: Changes in air quality would be measurable and would have appreciable consequences, although the effect would be relatively local. Air quality mitigating measures would be necessary, and they probably would be successful.

Major: Changes in air quality would be measurable, have substantial consequences, and be noticed regionally. Air quality mitigating measures would be necessary, and their success would be uncertain.

Impacts to Air

Impacts to air quality in Parashant would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Vegetation and Fire and Fuels Management
- Soil, Air, and Water
- Special Status Species (Parashant and Arizona Strip FO)
- Minerals (Arizona Strip FO only)
- Recreation
- Livestock Grazing

Alternative A: No Action

Impacts from Trails and Travel Management

Since off-road vehicle use contributes considerably to air impairments from fugitive dust, not authorizing any areas of the Monuments for cross-country, off-road vehicle use, except for authorized administrative and emergency purposes, and limiting travel on designated roads and trails would limit impacts to air quality. Fugitive dust would be minimal or nonexistent on 283,263 acres in Parashant, 89,829 acres in Vermilion, and 92,648 acres in the Arizona Strip FO closed to motorized and mechanized vehicle use, although some dust could blow in from adjacent roads along the boundaries of such areas.

The public would have access to 1,700 miles of unpaved roads in Parashant and 444 miles in Vermilion. Use of these roads would continue to create localized air pollution in the form of light fugitive dust, especially in the lowest and driest part of Parashant, such as Pakoon Basin. However, sandy soils in most of Vermilion have a low potential for producing fugitive dust and also keep vehicle speeds down, which would keep the amount of dust at low levels. Additional miles of roads in Parashant and in Vermilion would be open to administrative use only, which would contribute minimally to air quality impacts due to their expected relatively light use. Road maintenance activities, although minimal and designed solely to correct those conditions that are unsafe or hazardous, would also result in fugitive dust. Watering and the use of

chemical dust suppressants would greatly reduce the amount of dust emissions from airstrips and problem roads. Closing and rehabilitating 60 miles of roads in Parashant and 105 miles in Vermilion, as well as some additional roads where no public or administrative need exists, would result in reduced amount of fugitive dust within the immediate vicinity of the closed roads. The construction of no new motorized routes and would help maintain the current low level of impact from travel on roads into the future. Overall impacts to air quality from travel on unpaved roads and road maintenance/ improvement activities would be localized and short-term, and could be rated from negligible to minor.

In the Arizona Strip FO under Alternative A, motor vehicles would be limited to designated roads and trails on 282,019 acres of BLM lands and limited to existing routes on 1,575,140 acres of BLM lands. Since the vast majority of roads and trails in the Arizona Strip FO are not paved, use of these roads would result in fugitive dust. In addition, 803 acres of public lands would be open to motorized and mechanized vehicle use and an OHV event area would be designated under Alternative A. Vehicle use, specifically OHV use, in open areas and OHV “play” areas compared to designated and existing roads has the potential to cause the greatest amount of direct impacts to air quality in terms of fugitive dust. Closing and rehabilitating 20 miles in the Littlefield sub-region and 108 miles in the St George Basin sub-region would reduce the level of fugitive dust near the closed roads. When combined, these impacts would be negligible to minor, depending upon the level of use, speed of vehicle, and climatic conditions (e.g., amount of wind, humidity, and soil moisture). Road maintenance activities, which would be limited to existing route types, maintenance levels, and frequencies, would also result in fugitive dust. Watering and the use of chemical dust suppressants would greatly reduce the amount of dust emissions from maintenance and on haul roads from gravel pits, mines, and oil drilling sites.

Impacts from Vegetation and Fire and Fuels Management

The treatment efforts aimed at reducing fuel loads under Alternative A in Parashant and the Arizona Strip FO would decrease the chance of catastrophic fire. No maximum acreage limits would be set. Some of the treatments methods proposed (e.g., mechanical and chemical) would result in localized and short-term impacts to air quality, including fugitive dust, emission/exhaust from equipment, and chemical fumes. The use of naturally ignited wildland fire and prescribed fire would result in smoke emissions in the immediate area. In general, these impacts would be minor, although moderate intensity impacts could be experienced in the immediate vicinity of the treatment areas. The effects on air quality from wildland use fires would potentially be of longer duration than planned ignitions, depending on the vegetation types involved. Catastrophic fires, however, would result in greater, direct impacts resulting from smoke and fire abatement efforts. Indirect impacts from catastrophic fires could stem from reduced or eliminated vegetation cover, exposing the underlying soil to wind and water erosion, which would in turn increase levels of fugitive dust during wind events. Thus, while treatment efforts to reduce fuel loads would result in some direct but minor impacts to air quality, decreasing the potential of hazardous effects of unplanned wildfire would result in positive, indirect impacts to air quality that would be more widespread and longer term.

Because of the sparse vegetation and low productivity potential in Vermilion, no or minimal vegetation management is proposed under the alternatives. In addition, wildfires tend to be confined to single-tree events in Vermilion. As a result, there would be no or negligible impacts to air quality from Vegetation and Fire and Fuels Management in Vermilion.

Impacts from Soil, Air, and Water

Application of specific mitigation measures identified in activity level planning and NEPA level review would prevent or reduce impacts to air quality. In Parashant, mitigation during surface disturbing projects would reduce or eliminate the potential for fugitive dust.

Impacts from Special Status Species

The Pakoon Basin in Parashant is one of the lowest and driest parts of the Monument and thus more susceptible to fugitive dust. The ban on competitive speed events and restriction of non-speed events to designated roads within the Pakoon Desert Wildlife Management Area (DWMA) would prevent large amounts of fugitive dust in this area. Limits on driving speed, construction, maintenance, and use of roads within the Pakoon DWMA would also result in reduced fugitive dust in the Pakoon Basin. These impacts would be minor.

The proposed restrictions on road use, construction, and maintenance activities, fire and fuels treatments, and non-speed competitive events, and the ban on competitive speed events within the desert tortoise ACECs in the Arizona Strip FO would reduce the amount of fugitive dust within the vicinity of the ACECs. This impact would be minor.

Impacts from Minerals (Arizona Strip FO only)

Minerals exploration, development, construction, and operations could increase heavy and light vehicle traffic on paved and unpaved roads in the Arizona Strip FO, which would contribute to fugitive dust. Surface disturbing activities such as excavation, digging, and grading would increase the amount of fugitive dust. Adherence to best management practices outlined in mining laws, plans of operation, pertinent restrictions, standard terms and conditions, etc., would help minimize such impacts. Closing 80,710 acres of the Arizona Strip FO to fluids mineral leasing, withdrawing 100,896 acres to mining location, and closing 210,748 acres to mineral material disposal would virtually eliminate fugitive dust from mineral management within those areas. Overall impacts to air quality would be minor.

Impacts from Recreation

The greatest impacts from recreation would occur during competitive events, especially motorized events such as off-highway vehicle (OHV) races and rallies. Since no such events would be authorized in the Monuments, and non-motorized competitive events would not be

allowed in ACECs, wilderness areas, or NPS proposed wilderness, impacts to air quality in these areas would be negligible. In the Arizona Strip FO, the annual Rhino Rally motorcycle race would be allowed to continue, but restricted primarily to roads and washes and limited to 300 entrants. The race would create elevated levels of fugitive dust and tailpipe emissions within the vicinity of the race. While overall impacts would be short term and minor, the intensity of impacts in the immediate vicinity of the race could be short term and moderate.

Impacts from Livestock Grazing

Where grazing and associated soil disturbances near stock waters and corrals have powdered the soil surface, fugitive dust would continue to be evident, especially during wind events. Permittee travel on unpaved roads for activities relating to grazing operations would also contribute to fugitive dust. Overall impacts to air quality from grazing would be localized and short-term, and could be rated from negligible to minor.

Alternative B

Impacts from Trails and Travel Management

Impacts to air quality would be similar to what is described under Alternative A in the Monuments due to no areas open to off-road travel, travel limited on designated roads and trails, acres closed to motorized and mechanized vehicle use, and no new permanent motorized route construction. Overall impacts, however, would be reduced in the Monuments as the public would have access to less than half of the amount proposed under Alternative A. In addition, roughly twice as many miles of roads would be closed and rehabilitated, which would decrease the potential for fugitive dust throughout the Monument. While considerably more miles of roads would be open to administrative use only compared to Alternative A, use of these roads would be relatively light with fewer impacts to air quality than compared to public-use roads.

In the Arizona Strip FO, while motorized and mechanized vehicle use would be limited to designated and existing roads and trails on the same number of acres as Alternative A, no public lands would be open to motorized and mechanized vehicle use under Alternative B, which would eliminate impacts from vehicle use in open areas. In addition, no motorized speed event areas would be designated as no such events would be authorized, which would eliminate impacts to air quality from such events. More miles of roads would be closed and rehabilitated throughout the Arizona Strip FO, further reducing the level of fugitive dust near the closed roads. Additional route maintenance activities including road upgrades (e.g., widening, passing lanes, realignments, and travel surface upgrades) could occur under Alternative B compared to Alternative A. These activities would increase the potential for fugitive dust within the vicinity of the road improvement/construction activities, although mitigating measures would reduce such impacts. Additional impacts could occur due to possible increased traffic levels and/or speed limits on improved routes. Impacts would be localized, negligible to minor, and short term.

For the entire Planning Area, installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern could help maintain the current very good air quality within the Planning Area. Only maintaining routes within their existing disturbed surface area would also limit impacts to air quality both from maintenance activities and travel on such routes. The impacts would be localized and range from negligible to minor.

Impacts from Vegetation and Fire and Fuels Management

The types of impacts experienced as a result of fire and fuels management would be similar to those described under Alternative A, although maximum acreage limits would be set for various ecological zones. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative B would result in more or less acreage being treated than under Alternative A. However, fewer treatment methods would be authorized under Alternative B, which could limit direct impacts.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative A.

Impacts from Special Status Species

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

Under Alternative B in the Arizona Strip FO, the same or nearly the same amounts of BLM lands proposed closed and withdrawn would occur compared to Alternative A, thus resulting in similar impacts. However, nearly twice as many acres would be designated closed to mineral material disposal compared to Alternative A, reducing the total area where impacts to air quality would occur. Impacts would be localized and minor.

Impacts from Recreation

Impacts would be the same as described under Alternative A, with the following exception that applies to the Arizona Strip FO only: Impacts resulting from competitive events would be greatly reduced when compared to Alternative A, as no motorized speed events would be authorized. This would prevent the annual Rhino Rally from continuing in the Arizona Strip FO and thus eliminate the impacts to air quality from that and similar events.

Impacts from Livestock Grazing

The impacts would be the same as described under Alternative A.

Alternative C

Impacts from Trails and Travel Management

Impacts to air quality would be similar to that described under Alternative A due to no areas open to off-road travel, travel limited on designated roads and trails, and acres closed to motorized and mechanized vehicle use. Overall impacts, however, would be reduced as the public would have access to fewer miles of unpaved roads and more miles of roads would be closed and rehabilitated, which would decrease the potential for fugitive dust throughout the Monument compared to Alternative A, but not as much when compared to Alternative B. Differing from both Alternative B and A, new motorized routes could be constructed and additional route maintenance activities including road upgrades (e.g., widening, passing lanes, realignments, and travel surface upgrades) could occur. These activities could increase impacts to air quality within the vicinity of the road improvement/construction activities. Additional impacts could occur due to additional traffic on new routes and possible increased traffic and/or speed limits on improved routes. Impacts would be negligible area-wide, but could be minor to moderate along specific routes.

In the Arizona Strip FO, while motorized and mechanized vehicle use would be limited to designated and existing roads and trails on the same number of acres as Alternative A, more acres of BLM lands would be open to motorized and mechanized vehicle use under Alternative C, increasing the potential for impacts from vehicle use in open areas. However, more miles of roads would be closed and rehabilitated throughout the Arizona Strip FO compared to Alternative A, which would reduce fugitive dust stemming near the closed roads, but not as much as under Alternative B. Impacts from route maintenance/ improvement activities would be the same as described under Alternative B. When combined, impacts to air quality would be negligible to minor, depending upon the level of use, speed of vehicle, and climatic conditions (e.g., amount of wind, humidity, and soil moisture).

For the entire Planning Area, installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would have the same impacts as described under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

The types of impacts experienced as a result of fire and fuels management would be similar to those described under Alternative A, with maximum acreage limits being set for various

ecological zones. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative C would result in more or less acreage being treated than under Alternative A. More acres and treatment methods would be authorized than under Alternative B, potentially resulting in more, short-term direct impacts as a result of treatment efforts (e.g., fugitive dust from equipment use and smoke from prescribed fires). Less chance for indirect impacts would occur than under Alternative B, however, if less treatment efforts would result in greater risk of catastrophic fire.

Impacts from Special Status Species

Impacts would be the same as described under Alternative A.

Impacts from Protection of Resources: Soil, Air, and Water

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

Under Alternative C, similar amounts of BLM lands would be closed to fluid mineral leasing, withdrawn from mineral location, and closed to mineral material disposal as proposed under Alternative A, thus resulting in similar impacts. Compared to Alternative B, only a little more than half of that lands closed to mineral material disposal would occur, resulting in the potential for more impacts to air quality under Alternative C. Impacts would be localized and minor.

Impacts from Recreation

Impacts would be similar to that described under Alternative A, with the exception that, in the Arizona Strip FO, motorized speed events would only be authorized in the motorized speed event area in the St. George Basin. This would allow continuation of the annual Rhino Rally as it typically occurs in that area, and would concentrate all impacts from such events in the St. George Basin. While this would potentially increase short-term impacts to air quality within that area, it would reduce such impacts in other portions of the planning area.

Impacts from Livestock Grazing

The impacts would be the same as described under Alternative A.

Alternative D

Impacts from Trails and Travel Management

Impacts to air quality would be similar to that described under Alternative A due to no areas open to off-road travel, travel limited on designated roads and trails, and acres closed to

motorized and mechanized vehicle use. Overall impacts, however, would be reduced as the public would have access to fewer miles of unpaved roads and a number of roads would be closed and rehabilitated, decreasing the potential for fugitive dust throughout the Monument. However, Alternative D would result in more impacts to air quality from fugitive dust compared to Alternative B and C due to proposing more mileage of designated, unpaved roads and less mileage of closed roads. Impacts from the potential for new route construction and upgrades would be similar to that described under Alternative C.

While motorized and mechanized vehicle use in the Arizona Strip FO would be limited to designated and existing roads and trails on the same number of acres as Alternative A, nearly nine times the acres would be open to motorized and mechanical vehicle use when compared to Alternative A and nearly five times that compared to Alternative C. The relatively large size of open areas would considerably increase the potential for air quality impacts (e.g., fugitive dust and emissions) from vehicle use in and near such areas. While more miles of roads would be closed and rehabilitated throughout the Arizona Strip FO compared to Alternative A, reducing the level of fugitive dust near the closed roads, the amount of closed roads would be less than under Alternatives B and C. Impacts from route maintenance/improvement activities would be the same as described under Alternative B. When combined, impacts to air quality would be negligible to minor, depending upon the level of use, speed of vehicle, and climatic conditions (e.g., amount of wind, humidity, and soil moisture).

For the entire Planning Area, installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would have the same impacts as described under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

The types of impacts experienced as a result of fire and fuels management would be similar to those described under Alternative A, with maximum acreage limits being set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative D would result in more or less acreage being treated than under Alternative A. More acres and treatment methods would be authorized compared to Alternatives B and C, which would result in more, short-term direct impacts as a result of treatment efforts (e.g., fugitive dust from equipment use and smoke from prescribed fires), but less chance for indirect impacts if more treatment efforts would result in reduced risk of catastrophic fire. Impacts would range from minor to moderate.

Impacts from Special Status Species

Impacts would be the same as described under Alternative A.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

Under Alternative D, similar amounts of BLM lands would be closed to fluid mineral leasing, withdrawn from mineral location, and closed to mineral material disposal as proposed under Alternative A and C, thus resulting in similar impacts.

Compared to Alternative B, less than half of lands closed to mineral material disposal would occur, resulting in the potential for more impacts to air quality. Impacts would be localized and minor.

Impacts from Recreation

Impacts would be similar to that described under Alternative A with the exception that, in the Arizona Strip FO, air quality could slightly impacted in ACECs as competitive events could occur in ACECs. Impacts from motorized speed events would be similar to Alternative A, although permitting actual events, such as the Rhino Rally, would be determined on a case-by-case basis.

Impacts from Livestock Grazing

The impacts would be the same as described under Alternative A.

Alternative E: Preferred

Impacts from Trails and Travel Management

Impacts to air quality in the Monuments would be similar to that described under Alternative A due to no areas open to off-road travel, travel limited on designated roads and trails, and acres closed to motorized and mechanized vehicle use. Overall impacts, however, would be reduced as the public would have access to fewer miles of unpaved roads and a number of roads would be closed and rehabilitated, decreasing the potential for fugitive dust throughout the Monuments. However, Alternative E would result in more impacts to air quality from fugitive dust compared to Alternative B and C, but less compared to Alternative D due to the mileage of designated, unpaved roads and closed roads. Impacts from the potential for new route construction and maintenance/upgrades would be similar to that described under Alternative C.

In the Arizona Strip FO, while motorized and mechanized vehicle use would be limited to designated and existing roads and trails on the same number of acres as Alternative A, the

number of acres open to motorized and mechanical vehicle would be similar to Alternative D, resulting in similar impacts. However, more acres would be closed to motorized and mechanized vehicle use under Alternative E, reducing impacts to air quality in comparison to Alternative D. Impacts from route maintenance/improvement activities would be the same as described under Alternative B. When combined, impacts to air quality would be negligible to minor, depending upon the level of use, speed of vehicle, and climatic conditions (e.g., amount of wind, humidity, and soil moisture).

Installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would have the same impacts as described under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

The types of impacts experienced as a result of fire and fuels management would be similar to those described under Alternative A, with maximum acreage limits being set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative E would result in more or less acreage being treated than under Alternative A. Maximum acres and treatment methods would be more than under Alternative B but similar compared to Alternatives C and D, depending upon the ecological zone. This would result in more short-term direct impacts as a result of treatment efforts (e.g., fugitive dust from equipment use and smoke from prescribed fires) than under Alternative B, and more, less, or similar impacts compared to Alternative C and D. Less chance for indirect impacts would occur than under Alternative B if more treatment efforts would result in less risk of catastrophic fire, and similar chances for such impacts would occur when compared to Alternative C and D. The impacts would range from minor to moderate.

Impacts from Special Status Species

Impacts would be the same as described under Alternative A.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

Under Alternative E, similar amounts of BLM lands would be closed to fluid mineral leasing, withdrawn from mineral location, and closed to mineral material disposal as proposed under Alternative A, C, and D, thus resulting in similar impacts.

Compared to Alternative B, less than half of lands closed to mineral material disposal would occur, resulting in the potential for more impacts to air quality under Alternative E. Impacts would be localized and minor.

Impacts from Recreation

Impacts would be the same as described under Alternative A for the Monuments, but same as Alternative C for the Arizona Strip FO.

Impacts from Livestock Grazing

The impacts would be the same as described under Alternative A.

Cumulative Impacts

The geographic area of analysis for cumulative impacts to air quality is the Arizona Strip, including both Monuments, as well as southern sections of California, Nevada, and Utah. This region impacts the Planning Area's air quality in the form of regional haze from smog and dust. Considered having one of highest rates of population growth in the nation, continued population growth in the region would increase the amount of regional haze affecting the Planning Area. Construction of the Southern Corridor as well as increased use of Interstate 15 and other regional roads and highways would increase vehicle emissions and add to the regional haze that is blown into the Planning Area.

Increased population in the region would also result in increased levels of visitors to the Planning Area who travel on the mostly dirt and gravel roads. Such increased use would result in elevated levels of fugitive dust, as well as vehicle emissions in concentrated-use areas. Continuing or increasing gypsum and uranium mining in the region would also result in elevated levels of fugitive dust in the area from on-site activities and haul road use. Future droughts would also have long-term effects on air quality; as more vegetation cover would disappear, more acres of soils would become susceptible to wind events that would produce elevated levels of dust. Continued grazing during a drought would decrease vegetative cover and powder surface soils. Future creation of a Mohave County/Mesquite Habitat Conservation Plan and/or designation of critical habitats for future listings of up to 10 additional threatened or endangered species would reduce road use in more areas that would otherwise produce fugitive dust.

WATER

Impacts to water resources within the Planning Area are caused by cross-country vehicle travel, the use of vehicles on poorly constructed routes, mineral operations, livestock grazing, visitor use, and natural erosion. The effects of cross-country travel and livestock grazing include removal of surface cover (i.e., soil holding vegetation and rocks), displaced soil particles, increased soil compaction, creation of new flow paths and channels, and increased runoff. All of these combine to increase soil erosion and cause sedimentation of water resources. The effects of travel on poorly constructed routes are similar to the cross-country effects. Thus, the greater the number of poorly-constructed routes left open, the greater the impacts to surface water quality. The effects of livestock grazing and visitor use also include contamination of water sources from waste products.

Surface disturbing activities associated with minerals exploration, development, construction, and operations such as excavation, digging, and grading could increase runoff during storm events and contribute to water quality impairments downstream from the disturbed site.

Methods and Assumptions

The analysis of potential impacts to water resources is based on the expertise of BLM resource specialists at the Arizona Strip FO and the NPS staff at Lake Mead NRA. Combined, these staff members possess an extensive knowledge of water resources within Planning Area. The impact analysis is also based on review of existing literature and information provided by non-planning team experts in the BLM, NPS, and other agencies.

Quantifying effects to water resources, specifically to water quality, is difficult due to the lack of data. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible:** No changes to water quality would occur, or changes in water quality would be detectable but well below water quality standards or criteria, and would be within historical or desired water quality conditions.
- Minor:** Changes to water quality would be detectable, but well below water quality standards or criteria, and would be within historical or desired water quality conditions.
- Moderate:** Changes in water quality would be detectable but would be at or below water quality standards or criteria; however, historical baseline or desired water quality conditions would be altered on a short-term basis.

Major: Changes in water quality would be detectable and would be frequently altered from the historical baseline or desired water quality conditions and/or water quality standards or criteria would be slightly and singularly exceeded on a short-term basis.

Impacts to Water

Impacts to water resources in Parashant would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Vegetation and Fire and Fuels Management
- Soil, Air, and Water
- Special Status Species
- Wild Horse and Burros (Parashant only)
- Minerals (Arizona Strip FO only)
- Special Management Areas (Wild and Scenic Rivers; Vermilion and Arizona Strip FO)
- Recreation
- Livestock Grazing

Alternative A: No Action

Impacts from Trails and Travel Management

Under Alternative A, no parts of the Monuments would be open to motorized and mechanized cross-country vehicle travel as motor vehicles would be limited to designated roads and trails. As a result, impacts to water quality would be minimal. The construction of no new, permanent motorized routes and closing unnecessary roads where no public or administrative need exists would contribute to water quality protection. Impacts would be minor to moderate.

In the Arizona Strip FO, 803 acres would be open to motorized and mechanized vehicle use. Vehicle use, specifically OHV use, in open areas compared to designated and existing roads has the potential to cause the greatest amount of direct impacts to water quality in terms of erosion and runoff. Closing 123,100 acres would minimize such impacts within those areas closed. Overall impact to water quality would be minor.

Impacts from Vegetation and Fire and Fuels Management

Fire, mechanical, chemical or biological means would be used to maintain, restore, or improve riparian areas to achieve healthy and productive ecological conditions. This would result in short-term impacts from treatment-related surface disturbing activities. It would also have long-term impacts in maintaining and improving water quality in riparian areas. Impacts would be minor to moderate.

While impacts to water resources from vegetation management typically occur from fire and fuel management, fuel loads are low in Vermilion and very little treatments would be expected. Impacts would thus be negligible to minor.

In Parashant, grazing would continue to be authorized in the Cane Springs area between November and December. This would allow for continued sedimentation resulting from erosion due to trampling, compaction, and contamination due to waste products in the spring area. Due to the short duration of cattle in the area, impacts would be minor. The Pakoon Springs area would remain in its current state as no rehabilitation efforts would occur.

Fire and fuels treatments could impact water quality by temporarily increasing erosion rates and runoff. Wildland fire use would potential accelerate soil erosion and sedimentation, temporarily degrading water quality. Prescribed fires could increase erosion rates from fire-line construction, especially on steep slopes. This, in turn, could temporarily impact water quality. Mechanical treatments involve heavy equipment which could increase soil compaction, slowing re-establishment of vegetation cover, and thus could temporarily impact water quality from erosion and runoff. Mechanical and chemical use could also temporary impact water quality. Management prescriptions and post fire rehabilitation would help minimize some of these impacts. These impacts would be minor and short-term. However, long-term impacts to water resources associated with catastrophic fire would be much greater due to extensive amounts of vegetation cover lost leading to erosion and runoff and damaged by fire equipment off and on road to suppress the fires. Thus, while treatment would result in some direct but minor impacts to water quality, decreasing the potential of hazardous effects of unplanned wildfire by reducing fuel loads would result in indirect impacts to water quality that would be more widespread and longer term. Overall impacts would range from minor to moderate.

Impacts from Soil, Air, and Water

The application of specific mitigation measures identified in activity level planning and NEPA level review would reduce or prevent impacts to water quality. Avoiding floodplain occupancy and development would help protect the 100-year floodplain. Impacts would range from minor to moderate.

Impacts from Special Status Species

In Parashant, restrictions placed on livestock, vegetation management, recreation, transportation/access, and other surface disturbing activities within the Pakoon DWMA/ACEC would maintain and possibly improve water quality in that area by decreasing erosion rates. Because of the limited surface water in the area, consisting of a few springs and stock ponds, the impact would be minor. The impact would be negligible in terms of reducing salt contributions to the Colorado River. The modification, restriction, or prohibition made on activities that

degrade riparian habitat or reduce the potential of the area to support riparian vegetation would protect and/or improve water quality in riparian areas throughout Parashant.

No impacts would occur to water resources in Vermilion as a result of special status species management under Alternative A.

In the Arizona Strip FO, maintenance of the Virgin River ACEC at 8,075 acres for the protection of Virgin River fishes and managing land exchanges or disposals so that future developments would not adversely affect river flows in the Virgin River would help maintain water quality and quantity in the Virgin River. Modifying, restricting, or prohibiting actions that degrade riparian habitat or reduce the potential of the area to support riparian vegetation would help maintain the quality of water resources throughout the Arizona Strip FO. Impacts would be minor.

Impacts from Wild Horses and Burros

Keeping the herd management level for wild burros at zero in Parashant would continue to thwart impacts caused by trampling, compaction, and waste contamination of water resources from wild burros. Impacts would be minor.

Impacts from Minerals (Arizona Strip FO only)

Adherence to best management practices outlined in mining laws, plans of operation, pertinent restrictions, standard terms and conditions, etc., would help minimize impacts to water quality. Impacts would be minor. Closing or withdrawing areas from mineral operations would prevent such impacts within and downstream from the closed and withdrawn areas.

Impacts from Special Area Designations (Wild and Scenic Rivers)

Adhering to the interim management prescriptions to maintain the suitability determination of the Paria River study area in Vermilion and Virgin River study area in the Arizona Strip FO for inclusion in the National Wild and Scenic Rivers System and its tentative classifications would ensure protection of that water resource. Impacts would be minor.

Impacts from Livestock Grazing

Livestock grazing uses within the Monument would continue to be managed in keeping with applicable laws and regulations, and with the statewide standards and guidelines. Following these standards, the effects of livestock grazing on water quality in riparian areas would be assessed and appropriate and timely actions would be conducted to deal with those areas not meeting water quality standards. This would help to reduce the amounts of impacts to water resources.

Closing sensitive areas to grazing would help improve water quality and return riparian areas to proper functioning conditions. It would also eliminate impacts caused by trampling and compaction, thus allowing for greater vegetation cover and reduced erosion rates. Increased vegetation in small drainages would trap sediments, improve water quality, increase the alluvial water holding capacity, and heal rill and gully erosion. Finally, grazing closures would eliminate waste contamination of water resources within the closed areas. Under Alternative A, 199,350 acres in Parashant would not be available for grazing. Impacts within these closed areas could range from minor to moderate.

No allotments in Vermilion and the Arizona Strip FO would be closed under Alternative A; however, seasonal restrictions would continue to apply to the River Pasture of the Lees Ferry Allotment. This would create the potential for water quality impairment from trampling, erosion, compaction, and waste products to water resources in and near the allotments, including several springs and the Paria River. However, seasonal restrictions, rest rotation schedule, and management practices following the statewide standards and guidelines would reduce the level of impacts. Impacts would range from minor to moderate.

Impacts from Recreation

Visitor use is expected to increase throughout the Planning Area, especially in the Monuments, which would continue to impact water resources in the area. Instituting and/or adjusting visitor limits, regulations, or restrictions in the Monument and limiting recreational activities (e.g., camping, recreational stock use, etc.) in sensitive habitats, such as riparian areas, would help limit impacts. In Vermilion, limits placed on visitor use would especially be important in such places as Paria Canyon and Buckskin Gulch in Vermilion where large numbers of visitors in a limited space adjacent to a watercourse could increase impacts to water quality from waste products, trampling, and erosion. The limits placed on total visitor numbers and group size in these areas would continue to minimize these impacts. In the Arizona Strip FO, current recreation use permits and use fees program required for use in the Virgin Gorge Recreation Area, subject to adaptive management decisions deemed necessary through monitoring, evaluation, and further planning would help reduce and prevent impacts to water quality in the Virgin River.

Authorizing no motorized speed events in the Monuments would also help minimize impacts to water quality. Allowing the Rhino Rally to continue in the Arizona Strip FO, restricted primarily to roads and washes, could have localized impacts to water quality if such races occurred during or directly before/after rain events. Impacts would be minor and localized.

Alternative B

Impacts from Trails and Travel Management

In the Monuments, impacts to water resources would be similar to what is described under Alternative A. Additional protection would occur under Alternative B due to 444 miles of roads

in Parashant and 171 miles of roads in Vermilion being closed and rehabilitated. Impacts would be minor.

In the Arizona Strip FO, Alternative B is the most restrictive alternative in terms of OHV area designations, being the only alternative with no open areas, which would result in the least amount of impacts to water resources as a result of OHV use. However, additional road upgrade opportunities (e.g., widening, passing lanes, realignments, and travel surface upgrades) would be available under Alternative B and could result in greater impacts to water resources due to surface-disturbing activities, but would result in long-term improvements to water resources after upgrades are completed and properly working to reduce erosion and runoff. Impacts would be minor.

In the entire Planning Area, installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern could help reduce impacts to water quality.

Impacts from Vegetation and Fire and Fuels Management

Overall impacts to water resources in riparian areas would be similar to those described under Alternative A. Treatment priority that would be set for riparian areas aimed at improving and/or maintaining habitat conditions in important riparian areas would add to the protection of water resources. However, limits placed on riparian areas within southwestern willow flycatcher habitat may reduce efforts to improve, maintain, or restore water quality in such habitats. No planned vegetation treatments and preventing surface disturbing activities in riparian areas would reduce the chance for water quality impairments in the short term, but potentially allow for future impacts due to continued degradation of riparian areas. Impacts would be site-specific and minor.

In Parashant, the entire Cane Springs pasture of Cane Springs Allotment would be closed to grazing and the spring area allowed to naturally rehabilitate. This would greatly improve the water quality and quantity in the spring area compared to Alternative A. Impacts would be moderate. The Pakoon Springs area would be restored through natural process, which would improve water quality of the spring.

Impacts from fire and fuels treatment efforts to water resources would be similar to that described under Alternative A, although maximum acreage limits would be set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative B would result in more or less acreage being treated than under Alternative A, making comparing the impacts to water quality difficult. However, fewer treatment methods would be authorized under Alternative B, which could limit direct impacts.

Impacts from Soil, Air, and Water

Impacts would be similar to that described under Alternative A.

Impacts from Special Status Species

As under Alternative A, actions that degrade riparian habitat would be modified, restricted or prohibited. Additional restrictions under Alternative B include restrictions to recreation such as OHV use and camping that degrades habitat in riparian areas or areas with the potential to support riparian vegetation would help maintain and possibly improve water quality in those areas by reducing soil erosion and compaction. Ensuring that riparian areas would be in proper functioning condition and be of sufficient quantity and quality for special status raptor species, yellow-billed cuckoos, and Yuma Clapper Rail would ensure protection of water resources in those riparian areas.

In Parashant, although the Pakoon ACEC would be de-designated, protections offered to water resources would continue to be applied to the Pakoon DWMA, which covers the same area as the ACEC. Impacts would thus be the same as described under Alternative A.

In the Arizona Strip FO under Alternative B, the Virgin River ACEC would be modified to include only the 100-year floodplain (approx. 2,063 acres), which is only slightly more than a quarter size of the ACEC compared to Alternative A. This would limit the amount of protection to water resources and potentially increase the amount of impacts to water quality and quantity in the Virgin River. Designating the Kanab Creek ACEC and following strict management prescriptions associated with that designation would help maintain, possibly improving, water quality in the Kanab Creek area.

Impacts from Wild Horses and Burros

Impacts would be the same as described under Alternative A

Impacts from Minerals (Arizona Strip FO only)

The types of impacts from fluid mineral leasing and mining location would be similar to those described under Alternative A since the amount of acres closed and withdrawn would be similar. However, nearly twice as many acres would be designated closed to mineral material disposal compared to Alternative A, which would result in less impact to water resources.

Impacts from Special Area Designations (Wild and Scenic Rivers)

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

The overall impacts from livestock grazing would be similar to that described under Alternative A. Additional allotment closures and seasonal restrictions would improve water resources within those specific allotments in the manner described under Alternative A. Impacts would be localized and minor.

Impacts from Recreation

Overall impacts to water quality would be similar to that described under Alternative A, with the exception that not authorizing motorized speed events in the Arizona Strip FO would eliminate impacts from such activities.

Alternative C

Impacts from Trails and Travel Management

Overall impacts to water resources in the Monuments would be similar to what is described under Alternative A. One difference is that more protection to water resources would occur under Alternative C due to 225 miles of roads in Parashant and 104 miles in Vermilion being closed and rehabilitated, although this is only half as many miles closed when compared to Alternative B. Another difference compared to Alternatives A and B is that additional road upgrade opportunities (e.g., widening, passing lanes, realignments, and travel surface upgrades) could result in greater impacts to water resources due to surface-disturbing activities, but would result in long-term improvements to water resources after upgrades are completed and properly working to reduce erosion and runoff. Impacts would be minor.

In the Arizona Strip FO, almost twice the acres of public lands would be open to motorized and mechanized vehicles under Alternative C, increasing the potential for impacts to water resources. Additional impacts would be negligible due to the relatively small increase in open areas. Impacts from additional road upgrade opportunities would be the same as under Alternative B.

In all three planning areas, impacts from installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would be the same as under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

As under Alternative B, efforts at maintaining and improving habitat conditions in important riparian areas would maintain or improve water quality and quality in those areas. Under Alternative C, however, there would be more management and treatment occurring within the Riparian Ecological Zone, which would increase the chance for water quality impairments in the

short term, but potentially reducing future impacts due to continued degradation of riparian areas. Impacts would be site-specific and minor.

In Parashant, the riparian area of the Cane Springs pasture would be open for seasonal grazing with fence around the upper springs repaired. While the fence would prevent erosion from trampling and water quality impairment from waste products, the rest of the pasture would be susceptible to trampling, vegetation loss, and waste products, which could indirectly impair water quality during rain events. Seasonal restrictions would reduce such impacts. Impacts would be minor

Impacts from fire and fuels treatment efforts to water resources would be similar to that described under Alternative A, although maximum acreage limits would be set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative C would result in more or less acreage being treated than under Alternative A, making comparing the impacts to water quality difficult. More acres would be treated than under Alternatives B, resulting in more, short-term impacts to water quality but less potential for indirect, longer-term impacts if more treatment efforts would result in less risk of catastrophic fire. Such impacts would range from minor to moderate.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative A.

Impacts from Special Status Species

Impacts would be similar to those described under Alternative B, with the exception of impacts from the proposed Kanab Creek ACEC in the Arizona Strip FO. This ACEC would be 3,935 acres smaller than under Alternative B, thus reducing the amount of protection afforded to water resources in the Kanab Creek area.

Impacts from Wild Horses and Burros

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

The types of impacts from fluid mineral leasing and mining location would be similar to those described under Alternative A since the amount of acres closed and withdrawn would be similar. However, more acres would be designated closed to mineral material disposal compared to Alternative A, which would result in less impact to water resources.

Impacts from Special Area Designations (Wild and Scenic Rivers)

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

The overall impacts from livestock grazing would be similar to those described under Alternative A. The season of use would be shorter in some grazing allotments compared to Alternative A, but longer compared to Alternative B. This would result in less impacts to water resources in these allotments compared to Alternative A but more impacts compared to Alternative B. Ephemeral extensions would be allowed under Alternative C in the Pakoon Allotment and the Grand Gulch Wash area would be open to grazing. This would result in greater impacts to water resources in those areas due to grazing compared to both Alternatives A and B.

Impacts from Recreation

Overall impacts to water resources would be similar to that described under Alternative A, with the exception of impact from motorized speed events in the Arizona Strip FO. Under Alternative D, a motorized speed event area would be created in the St. George Basin. This would isolate impacts from such events to a specific, geographic area.

Alternative D

Impacts from Trails and Travel Management

Overall impacts to water resources in the Monuments would be similar to what is described under Alternative A. One difference is that more protection to resources would occur under Alternative D due to 158 miles of roads in Parashant and 87 miles in Vermilion being closed and rehabilitated, although this is less closed miles compared to Alternatives B and C. Impacts from additional road upgrades would result in impacts similar to those described under Alternative C.

In the Arizona Strip FO, nearly nine times the acres of public lands would be open to motorized and mechanized vehicle under Alternative D, increasing the potential for impacts to water resources. Overall impacts would be minor. Impacts from additional road upgrade opportunities would be the same as under Alternative B.

Impacts from installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would be the same as under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

As under Alternative B, efforts at maintaining and improving habitat conditions in important riparian areas would maintain or improve water quality and quality in those areas. Under Alternative D, however, there would be more management and treatment occurring within the Riparian Ecological Zone than both Alternatives B and C, which would increase the chance for water quality impairments in the short term, but potentially reducing future impacts due to continued degradation of riparian areas. Impacts would be site-specific and minor.

In Parashant, seasonal grazing of the Cane Spring Pasture of the Mud and Cane Allotment would be authorized, which would result in similar impacts to water resources in those areas as described under Alternative A, but greater impacts when compared to Alternatives B and C. Repairing and maintaining the fence around the upper springs would help minimize direct impacts to water quality in those springs.

Impacts from fire and fuels treatment efforts to water resources would be similar to that described under Alternative A, although maximum acreage limits would be set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative D would result in more or less acreage being treated than under Alternative A, making comparing the impacts to water quality difficult. More short-term impacts but potentially less long-term impacts would occur compared to Alternatives B and C due to more acres being treated. Impacts would range from minor to moderate.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative A.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B, with the exception of impacts from the Kanab Creek ACEC in the Arizona Strip FO. As under Alternative A, the Kanab Creek ACEC would not be designated under Alternative D. As a result, the Kanab Creek area would not receive the benefits to water resources that would occur under such a designation.

Impacts from Wild Horses and Burros

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

The impacts from mineral management would be similar to those described under Alternative A since the amount of acres closed to fluids mineral leasing and withdrawn to mining location would be similar. The least number of acres designated closed to mineral material disposal

would occur under Alternative D compared to the other alternatives, resulting in the greatest potential for impacts to water resources. Impacts would be minor.

Impacts from Special Area Designations (Wild and Scenic Rivers)

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

The overall impacts from livestock grazing would be similar to those described under Alternative A. Allotment closures, openings, and seasonal restrictions would be the least restrictive among the alternatives, resulting in a greater potential for impacts to water resources in the specific allotments. Development of new stock waters would cause additional impacts to water quality by creating new sacrifice areas.

Impacts from Recreation

Overall impacts to water quality would be similar to that described under Alternative A, with the exception of impacts in the Arizona Strip FO from motorized speed events. Under Alternative D, such events would be authorized on a case-by-case basis. It is uncertain whether this would result in more or fewer such events.

Alternative E: Preferred

Impacts from Trails and Travel Management

Overall impacts to water resources would be similar to what is described under Alternative A. One difference is that more protection to resources would occur in the Monuments under Alternative E due to 191 miles of roads in Parashant and 102 miles in Vermilion that would be closed and rehabilitated, although fewer miles would be closed compared to Alternatives B and C, but more compared to Alternative D. Impacts from additional road upgrades would result in impacts similar to those described under Alternative C.

In the Arizona Strip FO, the amount of acres open to motorized and mechanized use would be similar to Alternative D and thus allow for similar impacts to water resources as a result of OHV use in these areas. Impacts would be minor. Impacts from additional road upgrade opportunities would be the same as under Alternative B.

Impacts from installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would be the same as under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Impacts to water resources in riparian areas would mostly resemble that described under Alternative C. In addition, in Parashant, extensive site management of grazing and all associated facilities in the Riparian Pasture of the Mud and Cane allotment would help ensure protection and possible improvement of water quality in the area, although surface-disturbing activities associated with trail and facility development may result in short-term impacts to water resources.

Impacts from fire and fuels treatment efforts to water resources would be similar to that described under Alternative A, although maximum acreage limits would be set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative E would result in more or less acreage being treated than under Alternative A, making comparing the impacts to water quality difficult. More short-term impacts but potentially less long-term impacts would occur compared to Alternatives B due to more acres being treated, and less or similar impacts would occur compared to Alternative C or D, depending upon ecological zone. Impacts would range from minor to moderate.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative A.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B

Impacts from Wild Horses and Burros

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

The impacts from mineral management would be similar to those described under Alternative A since the amount of acres closed to fluids mineral leasing and withdrawn to mining location would be similar. Impacts would be minor.

Impacts from Special Area Designations (Wild and Scenic Rivers)

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

The overall impacts from livestock grazing would be similar to those described under Alternative A. Impacts from allotment closures, openings, and seasonal restrictions would be the same as under Alternative C or D, depending upon the allotment.

Impacts from Recreation

Overall impacts would be similar to that described under Alternative A, with impacts from motorized speed events in the Arizona Strip FO being the same as under Alternative C.

Cumulative Impacts

The geographic area of analysis for cumulative impacts to water resources is the Planning Area and drainages for the Virgin and Paria rivers and Kanab Creek located in Southern Utah. Population growth and development would continue to increase the demand for water and would continue to divert water from streams and springs thus reducing the numbers and sizes of riparian areas. The increasing OHV use would result in more soil surface damage and erosion. Run-off from roads would continue to increase sediment and salt loads of streams. Some roads intercept land surface flows, drying out some down slope sites, and channelizing the water to specific release points where it scours or dumps sediments on once stable areas. Livestock grazing would continue to decrease vegetative cover and infiltration rates and increase runoff, erosion, peak flows, compaction, runoff sediment, and salt loads in areas of concentrated use, such as near stock waters and corrals. Some springs would continue to be trampled and contaminated with animal wastes. Stock ponds reduce down stream peak flows and some may recharge local aquifers. Mineral development would increase runoff, erosion, and sediment loading in construction and mining areas. Additional mining roads would increase sediment and salt loads of streams and alter some down slope sites. An additional drought would result in decreasing vegetation and spring flow. The Fort Pearce Community Watershed Plan, the Upper Langs Run Watershed Management Plan, and the Fort Pearce Wash Salinity Control Plan would continue to reduce erosion and downstream peak flows, protect microbiotic soils, and trap saline sediments.

SOILS

Soils within the Planning Area are susceptible to impacts from compaction and disturbance, which can lead to accelerated erosion, soil loss, and reduced productivity. Management actions that involve ground disturbing activities, reducing vegetation cover, trampling, and using vehicles and heavy machinery can result in such impacts, especially in areas where geologic erosion is occurring. Similar to water resources, the greatest impacts to soil come from cross-country vehicle travel, the use of vehicles on poorly-constructed routes, mineral operations, livestock grazing, and visitor use. The effects of cross-country travel and livestock grazing

include reduction or disturbance of surface cover (i.e., soil holding vegetation, litter, and rocks), displaced soil particles, increased soil compaction, creation of new flow paths and channels, and increased runoff. All of these combine to increase soil erosion and ultimate loss. The effects of travel on poorly-constructed routes are similar to the cross-country effects. Thus, the greater the number of poorly-constructed routes left open, the greater the impacts through compaction and erosion.

Site specific surface disturbing activities associated with minerals exploration, development, construction, and operations such as excavation, digging, and grading result in soil displacement and compaction, ultimately leading to erosion during rain events.

Widespread effects of livestock grazing include compaction and surface crust destruction through trampling and decreasing vegetative ground cover, thereby increasing runoff and erosion and reducing water holding capacity and infiltration rates. Visitors engaged in off-road motorized or non-motorized activities also compact the soil, although the intensity of impact is much less for the non-motorized group. Camping also results in soil compaction and vegetation loss in small areas. Since soil is a non-renewable resource, all impacts leading to soil loss or to negative changes in soil characteristics, can have irreversible consequences.

Methods and Assumptions

The analysis of potential impacts to soils is based on the expertise of BLM resource specialists at the Arizona Strip FO and the NPS staff at Lake Mead NRA. Combined, these staff members possess an extensive knowledge of soil resources within the Planning Area. The impact analysis is also based on NRCS soil surveys, other agency maps and documentation, review of existing literature, and information provided by non-planning team experts in the BLM, NPS, and other agencies.

General soil types, erosion potential, structure, and function were discussed and impacts were analyzed. The analysis was based on reference information, site investigations, soil mechanics and engineering criteria, anticipated effects of management actions by alternative, and professional interpretation and judgment. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. When impacts are positive, it is so stated. The intensities of impacts are also described, where possible, using the following guidance:

Negligible: The amount of soil loss or erosion, or changes in soil characteristics would be at or below the level of detection.

Minor: The amount of soil loss or erosion, or changes in soil characteristics would be small, as would the area affected. If mitigation was needed to offset adverse effects, it would be relative simple to implement and would likely be successful.

- Moderate:** The amount of soil loss or erosion, or changes in soil characteristics would be readily apparent and result in a change in the productivity of the soil over a relatively wide area. Mitigating measures probably would be necessary to offset adverse effects and would likely be successful.
- Major:** The amount of soil loss or erosion, or changes in soil characteristics would be readily apparent and long-term and would substantially change the productivity of the soils over a large area. Extensive mitigation measures to offset adverse effects would be needed, and their success could not be guaranteed.

Impacts to Soils

Impacts to soils would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Vegetation and Fire and Fuels Management
- Soil, Air, and Water
- Special Status Species
- Wild Horse and Burros (Parashant only)
- Minerals (Arizona Strip FO only)
- Special Area Designations (ACECs)
- Recreation
- Livestock Grazing
- Lands and Realty

Alternative A: No Action

Impacts from Trails and Travel Management

Under Alternative A, no parts of the Monuments would be open to motorized and mechanized cross-country vehicle travel as motor vehicles would be restricted to designated roads and trails. Since cross-country travel is the most destructive to soils, this would have a moderate impact at protecting soils throughout the Monument. In the Arizona Strip FO, 803 acres would be open to motorized and mechanized vehicle use. Vehicle use, specifically OHV use, in open areas compared to designated and existing roads has the potential to cause the greatest amount of direct impacts to soils in terms of increasing erosion and runoff.

Many miles of routes designated as open to motorized/mechanized travel by the public throughout the Planning Area are non-graded, two-track trails. The use of such roads would have minor impacts on soils that are the most susceptible to compaction and rutting.

Use of non-motorized, wheeled game carriers would be allowed except in designated and NPS-proposed wildernesses. Such use could result in slight soil compaction, but impacts would be negligible. Direct impacts would occur to soils from road maintenance and use, resulting in road-edge disturbance, isolated erosion, and strong compaction. However, such impacts would be limited due to the focus on maintaining instead of enhancing existing roads. These impacts would be local, minor to moderate, and long-term. Allowing no new route construction in the Monuments, and closing and rehabilitating roads where no public or administrative need exists would contribute to soil protection. Impacts would be positive and minor to moderate.

Impacts from Vegetation and Fire and Fuels Management

Restoration and vegetation treatment projects aimed at improving vegetation health and cover would reduce erosion potential and increase soil productivity. However, mechanical, manual, or chemical treatments could result in soil compaction, some loss in vegetation cover, erosion, and changes in soil chemistry. Restrictions in sensitive areas would help protect fragile soil resources in such habitats. Treatment methods that cause substantial surface disturbance would generally not be permitted, protecting soils in the area. Impacts would be positive and would range from minor to moderate.

The majority of impacts to soils from vegetation management would occur from fire and fuel management. Wildland fire use would temporarily accelerate soil erosion and sedimentation, and potentially impact the physical, hydrological, chemical, and microbial properties of soil, lowering the productive potential. Prescribed fires could increase erosion rates from fire-line construction, especially on steep slopes. Mechanical treatments involving heavy equipment could increase soil compaction and runoff, slowing re-establishment of vegetation cover, and thus could result in erosion. Mechanical and chemical use could also impact soil chemistry and productivity. Management prescriptions and post fire rehabilitation would help minimize some of these impacts. Following minimum tool policy emphasizing hand tools, aircraft and other suppression methods that result in the least amount impacts to soils would minimize impacts in wilderness areas. These impacts would be minor but long-term. However, impacts to soils associated with catastrophic fire would be much greater due to a high percentage of vegetative cover loss and intense deep heating, resulting in soil sterilization and creation of hydrophobic surface layers. Use of heavy fire equipment off and on road to suppress the fires would cause compaction, and chemical retardant could alter soil chemistry. Thus, while treatment would result in some direct but minor impacts to soils, decreasing the potential of hazardous effects of unplanned wildfire by reducing fuel loads would result in positive indirect impacts to soils that would be more widespread and longer term. Impacts would range from minor to moderate.

Impacts from Soil, Air, and Water

Specific stipulations and permit requirements, including reclamation plans, to protect soils during and after surface disturbing activities in the Planning Area would minimize impacts. These include restriction that all surface disturbing activities be the minimum necessary to

complete the task; reclamation plans for road upgrades and/or realignments; specific soil stability measures for all surface disturbing activities on slopes greater than 15 percent; closing and reclaiming temporary roads, facilities, and improvements that are unnecessary; and emphasizing areas of moderate to severe erosion in Allotment Management Plans. Impacts would be minor Monument-wide, but potentially moderate at specific sites.

Impacts from Special Status Species

Maintenance or restoration of special status species habitats would help maintain soil productivity and limit erosion and could involve improving the condition of soils within those habitats.

The Pakoon ACEC in Parashant includes areas with severe erosion potential and areas with highly fragile microbiotic crusts. Restrictions or closures that would be maintained under Alternative A on livestock grazing, vegetation management, recreation, transportation/access, wild burros, and other surface disturbing or soil compacting activities within the ACEC would continue to limit erosion. This impact would be positive and minor throughout the ACEC, but potentially moderate in specific areas.

In the Arizona Strip FO, restrictions placed on the use of track vehicles, vegetation treatments, rights of way (ROWs), campgrounds, and other surface disturbing activities in desert tortoise habitat would also protect soils within such habitats. Retaining all BLM lands within desert tortoise critical habitats would help protect soils within those habitats. Maintenance of the special status species ACECs would continue protection of soils within their boundaries due to restrictions on surface disturbing activities. Impacts would be greatest in areas with compactable soils and severe wind and water erosion potential. Overall impacts to soils would be minor to moderate, long term, and site-specific.

Impacts from Wild Horses and Burros

Keeping the Herd Management Level for wild burros at zero in the Monument would eliminate impacts to soils caused by trampling, compaction, and reduced vegetation cover from wild burros. Impacts would be positive and negligible to minor.

Impacts from Minerals (Arizona Strip FO only)

In the Arizona Strip FO, adherence to best management practices outlined in mining laws, plans of operation, pertinent restrictions, standard terms and conditions, etc., would help minimize impacts to soils. Impacts would be minor. Closing or withdrawing areas from mineral operations would prevent impacts to soils within those areas.

Impacts from Livestock Grazing

Livestock grazing within the Planning Area would continue to be managed in keeping with applicable laws and regulations, and with the statewide standards and guidelines. If the statewide standards and guidelines are met, upland soils would exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform. Impacts would be minor area-wide, but potentially moderate in specific areas such as the Riparian Ecological Zone.

Closing sensitive areas to grazing would reduce soil compaction and erosion, stabilize soil surfaces, and restore productivity. Organic, surface crusts would slowly redevelop where there are now physical crusts, increasing the infiltration rate and reducing erosion. Under Alternative A, 199,351 acres in Parashant would not be open to grazing. This would reduce the amount of surface disturbance, compaction, and erosion from grazing activities. Impacts would be positive and minor to moderate, especially on those allotment soils that are susceptible to compaction and erosion.

No allotments would be closed to grazing in Vermilion and the Arizona Strip FO under Alternative A; however, seasonal restrictions would apply to some allotments. These include the river pasture of the Lees Ferry Allotment in Vermilion and the desert tortoise and southwestern willow flycatcher allotments in the Arizona Strip FO. Grazing in these allotments would create the potential for impacts to soils from trampling and vegetation removal, resulting in compaction and erosion. Seasonal restrictions following statewide standards and guidelines would reduce the level of impacts. Impacts would be long term, site specific, and minor.

Impacts from Recreation

Visitor use is expected to increase throughout the Monument, which would continue to impact soil resources in the area. Instituting and/or adjusting visitor limits, regulations, or restrictions the Monument and limiting recreational activities (e.g., camping, recreational stock use, etc.) in sensitive habitats would help limit impacts to soil resources. Responding to unacceptable resource conditions, including those relating to soils, would also help keep impacts at a low level. Areas where public recreation use is concentrated, such as campgrounds, trails, trail heads, and near visitor facilities, would experience the most soil compaction and erosion and a loss or reduction of vegetation cover. Under Alternative A, most recreation would be dispersed. Facility development would be minimal (e.g., directional, interpretive, or safety signing; interpretive sites; or kiosks) and be located along roadways. Signing may protect soil resources though preventing or reducing off-road damage. Overall impacts would be minor, but potentially moderate in highly concentrated recreation areas.

Paria Canyon, Buckskin Gulch, Wire Pass, and Coyote Buttes are areas in Vermilion where large numbers of visitors in a limited space could affect soils through compaction and surface disturbance, leading to increased wind and water erosion. These areas would experience the

most amount of soil compaction and loss or reduction of vegetation cover, as well as destruction of biological crusts. Under Alternative A, limits would be placed on total visitor numbers and group size in these areas, which would continue to minimize these impacts. Monitoring and using an adaptive management program to address necessary changes to visitor use numbers could help limit unacceptable impact to soils. Soils would be protected from trampling and compaction in areas where horses and pack stock would be prohibited (in Paria Canyon upstream from Bush Head Canyon), but would become susceptible from such impacts where horses and pack stock are allowed. Impacts would be minor to moderate, long term, and site specific.

The greatest impacts to soils would occur from off-road vehicle use and motorized speed events. While no areas within the Monument would be open to off-road vehicle use and no motorized speed events would be authorized, it is likely that some illegal off-road activities would occur. In the Arizona Strip FO, the annual Rhino Rally motorcycle race would be allowed to continue under Alternative A, but restricted primarily to roads and washes and limited to 300 entrants. The race could increase erosion levels along the course due to the volume of participants and the actual course used. While overall impacts would be short term and minor, the intensity of impacts in the immediate vicinity of the race could be long term and moderate due to post-race use.

Impacts from Lands and Realty

In the Monuments, appropriating and withdrawing all federal lands and interests in lands from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws would provide protection to soils under federal management practices as well as protect the Monument from certain surface disturbing activities that could cause compaction and erosion. Processing no new ROWs and ancillary public facilities, with a few exceptions, would also limit impacts to soils. Impacts would be positive, long-term, and negligible.

In the Arizona Strip FO, acquiring non-federal lands in Virgin River riparian areas, DWMA/ACECs, wilderness areas, and RCAs, and reserving and/or managing them as part of the NLCS unit or administratively designated area would provide protection to soils within these lands due to the restrictions placed on surface disturbing activities by the BLM. Retaining designated or proposed critical habitat and lands supporting listed species would continue to provide protection to soils in these areas. Making up to 7,335 acres available for exchange, sale, or R&PP sales and an additional 17,853 acres available for exchange, for a total of 25,188 acres, would make these lands susceptible to increased impacts to soils compared with remaining in federal ownership, although prospective future owners would be advised on the need for ESA compliance. Any new land use authorizations (ROWs, permits, leases, easements, etc.) would impact soils through compaction and vegetation removal, which could lead to erosion. Impacts would be minor to moderate and localized.

Alternative B

Impacts from Trails and Travel Management

Impacts would be similar to what is described under Alternative A. Additional protection to soils would occur under Alternative B due to 444 miles of roads in Parashant and 171 miles in Vermilion being closed and rehabilitated, which is the most acres and miles closed among the alternatives. In addition, 1,095 less miles in Parashant and 295 less miles in Vermilion would be open to motorized/mechanized travel by the public, which would reduce total miles of non-graded, two-track trails that would experience compaction and rutting. Impacts would be site specific, long-term, and range from minor to moderate. Prohibiting wheeled game carriers throughout the Monuments would also protect soils from compaction, although the impact would be negligible. Limiting route maintenance to within the existing disturbed surface area would also reduce further soil compaction and erosion.

In the Arizona Strip FO, Alternative B is the most restrictive alternative in terms of OHV area designations, being the only alternative with open areas and no authorization for motorized speed events. Although fewer acres would be closed to motorized and mechanized vehicle use, impacts to these areas would be negligible due to other forms of protection. In addition, no new motorized routes would be considered listed species habitat and non-motorized trail construction would be considered only when needed to protect sensitive resources, minimizing the impacts to soil from these activities. Alternative B would thus result in the least amount of impacts to soils as a result of OHV use and route/trail construction. However, additional road upgrade opportunities (e.g., widening, passing lanes, realignments, and travel surface upgrades) would be available under Alternative B and could result in greater impacts to soils due to surface-disturbing activities than under Alternative A, but would result in long-term improvements to soil resources after upgrades are completed and properly working to reduce erosion and runoff. Impacts would be localized and minor. Prohibiting wheeled game carriers in ACECs as well as designated wildernesses would protect soils from compaction within the ACECs, although the impact would be negligible.

For the entire Planning Area, installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern could help reduce impacts to soils. Impacts would be minor, long term, and site specific.

Impacts from Vegetation and Fire and Fuels Management

Overall impacts to soils would be similar to those described under Alternative A. Additional protection would occur on NPS lands in Parashant due to the development of individual restoration plans that include measures to reduce soil erosion.

Under Alternative B in Parashant, the entire Cane Springs pasture of Cane Springs Allotment would be closed to grazing and the spring area allowed to naturally rehabilitate. This would result in decreased surface disturbance, erosion, and compaction and increased vegetation cover in the pasture compared to Alternative A. Impacts would be moderate. Also under Alternative B, the Pakoon Springs area would be restored through natural process, which would decrease soil erosion and improve soil productivity through time. Impacts would be minor.

Impacts from fire and fuels treatment efforts to soils would be similar to that described under Alternative A for the entire Planning Area, although maximum acreage limits would be set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative B would result in more or less acreage being treated than under Alternative A, making comparing the impacts to soils difficult. However, fewer treatment methods would be authorized under Alternative B, which could limit direct impacts.

Impacts from Soil, Air, and Water

Impacts would be similar to that described under Alternative A. Additional protection to soils would result from emphasizing management of all allotments in Watershed Condition Class IV to reduce erosion and improve the watershed condition class. In addition, Upper Lang's Run, Black Rock Mountain, and Parashant watersheds, portions of which are located in both Parashant and the Arizona Strip FO, would receive priority for assessment, treatments and/or restrictions on use to reduce erosion. The same priority would be given to Lower Hurricane Valley, Fort Pearce Salinity Area, Clayhole Flood Control Structures Area, and Wild Band Valley watersheds, all of which are located in the Arizona Strip FO. Priority would be given to all watersheds in Vermilion for assessment, treatments, and/or restrictions on use to reduce erosion. Impacts would be localized and minor.

Impacts from Special Status Species

Restrictions placed on livestock grazing, fire management, and recreation (e.g., OVH use, camping, and horseback riding) that degrades special status species habitat would limit soil erosion and compaction in those habitats. Impacts would be site specific and minor.

In Parashant, although the Pakoon ACEC would be de-designated under Alternative B, protections offered to soil resources would continue to be applied to the Pakoon DWMA, which covers the same area as the ACEC. Impacts would thus be the same as described under Alternative A.

In Arizona Strip FO, there would be some additional restrictions on surface disturbing activities from fire management, grazing, recreation, and development of facilities in special status species habitats that would provide additional protection to soils within those habitats. Impacts would be minor and site specific. Designating additional or increasing the size of existing ACECs would

help protect soils within the ACECs due to specific restrictions on grazing, recreation, vegetation treatment, and other surface disturbing activities. Impacts would be greatest in compactable soils and areas with severe wind and water erosion potential. Overall impacts to soils would be long term, site specific, and range from minor to moderate.

Impacts from Wild Horses and Burros

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

The types of impacts from fluid mineral leasing and mining location would be similar to those described under Alternative A since the amount of acres closed and withdrawn would be similar. However, nearly twice as many acres would be designated closed to mineral material disposal compared to Alternative A, which would result in less impact to soils.

Impacts from Livestock Grazing

Overall impacts from livestock grazing would be similar to that described under Alternative A. Additional allotment closures and seasonal restrictions would benefit soils within those specific allotments by eliminating any potential impacts to soils from trampling, and would increase vegetative cover and benefit biological crusts. Closures and/or restrictions involve desert tortoise allotments in Parashant and the Arizona Strip FO, willow flycatcher allotments in the Arizona Strip FO, and the river pasture of the Lees Ferry Allotment in Vermilion. Impacts would be long term, site specific, and range from minor moderate.

Impacts from Recreation

Overall impacts from visitor use would be similar as described under Alternative A. Added protection to soils in the Monuments would result from additional restrictions on camping, including limiting camping to designated sites only. While soil disturbance, compaction, and erosion would be greater at small, more concentrated use sites, such as designated camping areas, limiting camping to these areas would limit the creation of new areas of compaction and erosion. In Vermilion, prohibiting stock use in Paria Canyon would eliminate impacts to soils from such use. Impacts would be minor. In the Arizona Strip FO, soils would receive added protection due to no motorized speed events being authorized. Impacts would be site specific, long term, and range from minor to moderate.

Impacts from Lands and Realty

Retaining lands and interests in lands (including minerals) in federal ownership within NLCS units (e.g., designated wilderness, national monuments, NHTs), administratively designated areas (e.g., ACECs), areas allocated to maintain wilderness characteristics, Wild and Scenic

River study areas, DWMAAs, critical habitat, lands supporting listed species, important riparian areas, and springs, seeps, etc., and reserving and/or managing them as part of the NLCS unit or administratively designated area would provide protection to soils within these lands due to the restrictions placed on surface disturbing activities by the BLM. Making 1,507 fewer acres in the Arizona Strip FO available for exchange, sale, or R&PP lease/sale would result in fewer impacts due to soils due to more acres being retained in federal ownership. Fewer and/or more restrictive new land use authorizations (ROWs, permits, leases, easements, etc.) would occur under Alternative B, resulting in fewer impacts to soils.

Alternative C

Impacts from Trails and Travel Management

Overall impacts would be similar to that described under Alternative A. Additional protection to soils in the Monuments would occur under Alternative C due to 222 miles of roads in Parashant and 104 miles in Vermilion being closed and rehabilitated, although this is less than proposed under Alternative B. In addition, fewer miles would be open to motorized/mechanized travel by the public, which would reduce total miles of non-graded, two-track trails that would experience compaction and rutting; however, not as much as under Alternative B. Differing from both Alternative B and A, new road and trail construction would be allowed in the Monuments, which would increase the surface disturbance, compaction, and erosion in the area of the constructed routes. Another difference is that additional road upgrade opportunities (e.g., widening, passing lanes, realignments, and travel surface upgrades) could result in greater impacts to soils due to surface-disturbing activities, but would result in long-term improvements to soils after upgrades are completed and properly working to reduce erosion and runoff. Overall impacts would be site specific, long-term, and range from minor to moderate.

In the Arizona Strip FO, impacts from the number of acres closed to motorized and mechanized vehicle use and route maintenance activities would be similar to Alternative B; however, there would be fewer restrictions on new permanent motorized route and non-motorized trail construction, which could increase the potential for impacts to soils from such activities. Impacts would be localized and minor. Impacts from a designated motorized speed event area would be similar to Alternative A. Impacts from wheeled game carriers would be the same as under Alternative B, with the exception that they would be allowed in areas having wilderness characteristics, although this would have no additional impact to soils.

For the entire Planning Area, installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would have the same impacts as under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Overall impacts to soils would be similar to those described under Alternative B, including impacts from the development of individual restoration plans on NPS lands.

Under Alternative C, the riparian area of the Cane Springs pasture would be open for seasonal grazing with the fence around the upper springs repaired. While the fence would prevent further compaction and vegetation loss from grazing around the spring, and thus reduce erosion and improve productivity, the remainder of the pasture would be exposed to these impacts. Seasonal restrictions would reduce such impacts. Impacts would be localized and range from minor to moderate.

Impacts from fire and fuels treatment efforts to soil resources would be similar to that described under Alternative A, although maximum acreage limits would be set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative C would result in more or less acreage being treated than under Alternative A, making comparing the impacts to soils difficult. More acres would be treated and treatment methods used compared to Alternatives B, resulting in more, short-term impacts to soils but less potential for indirect, longer-term impacts if more treatment efforts would result in less risk of catastrophic fire. This impact would range from minor to moderate.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative B.

Impacts from Special Status Species

In the Monuments, impacts would be the same as described under Alternative B. In the Arizona Strip FO, impacts from the management of special status species habitats would be similar to that proposed under Alternative A, including impacts from restoration activities, restrictions placed on various surface disturbing activities, and retaining lands in federal ownership. There would be some additional restrictions on surface disturbing activities from fire management, grazing, recreation, and development of facilities in special status species habitats that would provide additional protection to soils within those habitats compared to Alternative A, although there would be fewer or less intense restrictions than under Alternative B. Impacts would be minor and site specific. In addition, ACEC management restrictions would cover a greater area than under Alternative A, which would protect more acres of soil, but much fewer acres when compared to Alternative B. Overall impacts to soils would be minor, long term, and site-specific.

Impacts from Wild Horses and Burros

Impacts would be the same as described under Alternatives A.

Impacts from Minerals (Arizona Strip FO only)

The types of impacts from mineral management in the Arizona Strip FO would be similar to those described under Alternative A since the amount of acres closed to fluids mineral leasing and withdrawn to mining location would be similar. Roughly, nine thousand more acres would be designated closed to mineral material disposal compared to Alternative A, which would result in fewer impacts to soils, but more impacts compared to Alternative B.

Impacts from Livestock Grazing

The overall impacts from livestock grazing would be similar to those described under Alternative A. In Parashant, impacts from restrictions place on the Mosby-Nay Allotment would be similar to Alternative B, although closures would not be as extensive. The season of use would be shorter for the Pakoon Springs and Pakoon allotments compared to Alternative A, reducing impacts to soils in these allotments compared to Alternative A, but involve more impacts compared to Alternative B. In Vermilion, specific impacts to the Lees Ferry Allotment would also be similar to Alternative A, although the allotment would be managed as a forage reserve and the season of use would be more restrictive, thus reducing the level of impact to soils. Impact would be minor. In the Arizona Strip FO, impacts from grazing in desert tortoise allotments and the Cedar Wash Allotment would be the same as described under Alternative A. Season of use and other management prescriptions may be applied to the portions of the Mesquite and Littlefield Community Allotments outside the Littlefield Slope pastures, which would have a negligible to minor impact on soils. Impacts to specific southwester willow flycatcher habitats would be the same as described under Alternative B.

Impacts from Recreation

Overall impacts to soils would be similar to those described under Alternative A, with a few exceptions. Under Alternative C, camping would be limited to existing sites or disturbed areas in the Monuments. This would limit the creation of new areas of compaction and erosion compared to Alternative A, although impacts would be more widespread compared to Alternative B. In the Arizona Strip FO, a motorized speed event area would be identified, which may limit the area of impact from such events as the Rhino Rally.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A in the Monuments. Impacts would be similar to that described under Alternative B in the Arizona Strip FO, although more impacts to soils could occur due to an additional 1,638 acres than Alternative B or 131 acres than Alternative A of public land being made available for exchange, sale, or R&PP lease/sale.

Alternative D

Impacts from Trails and Travel Management

Impacts would be similar to that described under Alternative C in the Monuments, including the potential for new road/trail construction and upgrades. Additional protection to soils would occur under Alternative D compared to Alternative A due to 158 miles of roads in Parashant and 87 miles of roads in Vermilion being closed and rehabilitated (less than proposed under Alternatives B and C) and fewer miles of roads/trails open to the public (more than proposed under Alternatives B and C).

In the Arizona Strip FO, impacts from acres closed to motorized and mechanized vehicle use and route maintenance activities would be similar to Alternative B. Impacts from permanent motorized route and non-motorized trail construction and use of wheeled game carriers would be the same as under Alternative C. Alternative D would differ from the other alternatives in terms of having 7,186 acres of BLM land open to motorized and mechanized vehicle use, including one large area south of St. George and one small area south of Fredonia, nearly nine times the open acres proposed under Alternative A and nearly five times that proposed under Alternative C. Use of these areas would cause the greatest impacts to soils, especially south of St. George. Impacts would be localized, long-term, and moderate. In addition, the greatest amount of new route and trail construction could occur under Alternative D to support recreation opportunities, which would lead to more impacts to soils than under Alternatives A, B, or C. Overall, the greatest impacts to soils from Trails and Travel Management would occur under Alternative D.

For the entire Planning Area, installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would have the same impacts as described under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Overall impacts to soils would be similar to those described under Alternative C. In Parashant, seasonal grazing of the Cane Spring Pasture of the Mud and Cane Allotment would be authorized, which would result in a similar impacts to soils in the area as Alternative A, but greater impacts when compared to Alternatives B and C. Repairing and maintaining the fence around the upper springs would help minimize direct impacts to soils in those springs.

Impacts from fire and fuels treatment efforts to soils would be similar to that described under Alternative A, although maximum acreage limits would be set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative D would result in more or less acreage being treated than under Alternative A, making comparing the

impacts difficult. More short-term impacts but potentially less long-term impacts would occur compared to Alternatives B and C due to more acres being treated and treatment methods being used. More, less, or similar impacts would occur compared to Alternatives E, depending upon ecological zone. Impacts would range from minor to moderate.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B for the Monuments. In the Arizona Strip FO, impacts from the management of special status species habitats would be similar to that proposed under Alternative A, including impacts from restoration activities, restrictions placed on various surface disturbing activities, and retaining lands in federal ownership. There would be some additional restrictions on surface disturbing activities from fire management, grazing, recreation, and development of facilities in special status species habitats that would provide additional protection to soils within those habitats compared to Alternative A, although there would be fewer or less intense restrictions than under Alternative B or C. Impacts would be minor and site specific. All four Siler pincushion ACECs would be de-designated. As a result, the protection to soils afforded by the ACEC designations would be lost. Impacts from the Marble Canyon ACEC and desert tortoise ACECs would be the same as under Alternative C. Also similar to Alternatives A is that no new ACECs would be designated under Alternative D, resulting in no added protection to soils that ACEC designations would provide. Impacts would be site specific, long term, and range from minor to moderate.

Impacts from Wild Horses and Burros

Impacts would be the same as described under Alternative A.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be similar to those described under Alternative A from the number of acres closed to fluids mineral leasing and withdrawn to mining location. However, Alternative D proposes the fewest acres designated closed to mineral materials disposal among the alternatives, resulting in the greatest potential for impacts to soils. Impacts would be minor and site specific.

Impacts from Livestock Grazing

Overall impacts would be similar to those described under Alternative A. In Parashant, season of use and other management prescriptions could be established in the Mosby-Nay, and Pakoon Springs Allotments, potentially reducing soil compaction/erosion in these allotments. Impacts would be negligible to minor. The portion of the Pakoon Allotment within the Pakoon DWMA

(closed under Alternative A) would be open for grazing, which would make it susceptible to compaction and erosion. Impacts would be minor and site specific. In Vermilion, specific impacts to the Lees Ferry Allotment would also be similar to Alternative A, although it would be managed as a forage reserve. In the Arizona Strip FO, impacts from grazing in desert tortoise allotments would be similar to but more intense than that described under Alternative A due to the option to authorize ephemeral extensions, potentially increasing grazing by up to two months and creating the potential for greater impacts to soils in those allotments. Impacts to specific southwester willow flycatcher habitats would be the same as described under Alternative B.

Impacts from Recreation

Impacts would be similar to that described under Alternative C, with the exception that horse and stock use would be allowed in more portions of Paria Canyon, which would increase the total area impacted from trampling and erosion resulting from such use. Impacts would be minor.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A for the Monuments, but similar to Alternative C for the Arizona Strip FO.

Alternative E: Preferred

Impacts from Trails and Travel Management

Impacts would be similar to what is described under Alternative C in the Monuments, including the use of wheeled game carriers and potential for new route construction and upgrades. Additional protection to soils would occur under Alternative E compared to Alternative A due to 191 miles of roads in Parashant and 102 miles of roads in Vermilion being closed and rehabilitated (more than under Alternative D but less than under Alternatives B and C). In addition, fewer miles being open to the public, which would result in less impacts to soils compared to Alternatives A and D, but more when compared to Alternatives B and C.

In the Arizona Strip FO, impacts would be similar to those described under Alternative D, including those stemming from the number of acres open to motorized and mechanized vehicle use.

For the entire Planning Area, installing structures/barriers on routes to control unauthorized use, monitoring to detect routes caused by unauthorized use and then immediately obscuring and rehabilitating such unauthorized routes, and rerouting and reclaiming routes causing resource damage or with safety concern would have the same impacts as under Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Overall impacts to soils would be similar to those described under Alternative C. In Parashant, extensive site management of grazing and all associated facilities in the Riparian Pasture of the Mud and Cane allotment would help ensure protection and possible improvement of soils in the area, although surface-disturbing activities associated with trail facilities development may result in short-term impacts to soils.

Impacts from fire and fuels treatment efforts to soils would be similar to that described under Alternative A, although maximum acreage limits would be set. Since no maximum treatment acreage limits would be set under Alternative A, it is uncertain whether Alternative E would result in more or less acreage being treated than under Alternative A, making comparing the impacts difficult. More short-term impacts but potentially less long-term impacts would occur compared to Alternatives B to more acres being treated and treatment methods being used, and less or similar impacts would occur compared to Alternatives C and D, depending upon ecological zone. Impacts would range from minor to moderate.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B for the Monuments. In the Arizona Strip FO, impacts from the management of special status species habitats would be similar to that proposed under Alternative A, including impacts from restoration activities, restrictions placed on various surface disturbing activities, and retaining lands in federal ownership. Impacts from additional restrictions on surface disturbing activities in special status species habitats would be similar to those described under Alternative D. Impacts would be minor and site specific.

Impacts from the Siler pincushion cactus ACECs, the Virgin River ACEC, and designation of the Lone Butte, Black Knolls, and Kanab Creek ACECs would be the same as under Alternative B. Impacts from the Marble Canyon ACEC; desert tortoise ACECs, with the exception of the Virgin River ACEC; and not designating the Twist Hills, Clayhole, Buckskin, and Coyote Valley ACECs would be the same as described under Alternative C.

Impacts from Wild Horses and Burros

Impacts would be the same as described under Alternative A.

Impacts from Soil, Air, and Water

Impacts would be the same as described under Alternative B.

Impacts from Livestock Grazing

The overall impacts from livestock grazing would be similar to those described under Alternative A. In Parashant, impacts from allotment closures, openings, and seasonal restrictions would be the same as under Alternative C or D, depending upon which allotment. In Vermilion, such impacts would be the same as described under Alternative B. In the Arizona Strip FO, impacts from grazing in desert tortoise allotments would be the same as described under Alternative A. Impacts from grazing on the portions of the Mesquite and Littlefield Community Allotments outside the Littlefield Slope pastures and the Cedar Wash Allotment would be the same as under Alternative C. Impacts to specific southwester willow flycatcher habitats would be the same as described under Alternative B.

Impacts from Recreation

Overall impacts to soils would be similar to those described under Alternative C.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A in the Monuments, but the same as under Alternative C in the Arizona Strip FO.

Cumulative Impacts

The geographic area for analysis of cumulative impacts to soils is the Planning Area. The soils in the area formed under conditions that had no vehicles or large numbers of large animals to impact them. Population growth, grazing, and developments in the past 150 years, have resulted in soil disturbance on hundreds of thousands of acres at and near homesteads, communities, roads, and waters in the Planning Area. Continued population growth and the resulting growth in vehicle and OHV use and visitation in the region would continue to add to the acreage of soil disturbance. Continued AMP implementation, watershed plans, and the Standards and Guides process would continue to examine livestock grazing areas for impacts and would apply remedies to decrease compaction and erosion. Continued and/or additional gypsum mining would increase disturbance to soils. Renewed exploration or production of uranium would increase soil disturbance on access roads and at mine sites. Reclamation would stabilize the replaced soils. Federal designations of wilderness and national Monuments and parks would continue to reduce roads, OHV use, and erosion. Additional droughts would reduce overall vegetative cover making soils more susceptible to erosion, especially where there is surface disturbance. Wildfire would continue to make soils more susceptible to erosion. The Fort Pearce Community Watershed Plan, the Upper Langs Run Watershed Management Plan, and the Fort Pearce Wash Salinity Control Plan would continue to control floods, reduce erosion, reduce downstream peak flow, protect microbiotic soils, and trap saline sediments.

GEOLOGY AND PALEONTOLOGY

This section presents potential impacts of the alternatives on geological and paleontological resources. Many of the well known and spectacular or unique geological resources in the Planning Area are managed with other resources under special area designations, such as wilderness areas, national monuments, and ACECs. The locations of some less familiar geological resources, such as cave and karst resources, sink holes, lava tubes, and breccia pipes are lesser known. The Planning Area has not been surveyed for paleontological resources and the occurrences of most paleontological resources are not known. See Chapter 3 for a discussion of the geological and paleontological resources in the Planning Area.

Impacts to geological and paleontological resources occur by erosion, vehicles driving off roads, excavation, theft, vandalism, and surface disturbing activities such as trampling by animals and humans. Experience has shown that damage, theft, and vandalism are usually concentrated near roads and trails. Impacts to geological and paleontological resources may increase because of additional visitation to the Planning Area.

Methods and Assumptions

The analysis of potential impacts to geological and paleontological resources is based on the expertise of BLM resource specialists at the Arizona Strip FO and the NPS staff at Parashant and Lake Mead NRA. The impact analysis is also based on review of existing literature, geologic maps, field trips, site visits, and information provided by non-planning team experts in the BLM, NPS, USGS, and other agencies.

Specific impacts on geological resources are not always readily identifiable. This is because some impacts on geology are difficult to separate from impacts to other resources that geology supports. Thus, the impacts on geology are often discussed, either implicitly or explicitly, in the discussion of impacts to other resources such as paleontology and scenic quality (Visual Resources).

Paleontological resources are associated with specific geologic formations. Appendix 3.B is a summary table of the fossil assemblages associated with each geologic formation, group, and member in the Planning Area. No vertebrate fossil remains have been documented in the Planning Area. However, vertebrate fossil remains are found adjacent to the Planning Area within many of the same geologic formations present in the Planning Area. Fossil vertebrate footprints (ichnites) are documented in the Planning Area.

All surface disturbing activities include mitigation to reduce impacts to geological and paleontological resources. Analysis of impacts includes any and all mitigation.

Effects are quantified where possible. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in

qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible:** The impact to geological or paleontological resources would not be detectable through standard observation. The effect would be at the lowest levels of detection, barely measurable and without any perceptible consequences, either beneficial or adverse.
- Minor:** The impact would be detectable. The beneficial or adverse impact would be measurable or perceptible, but it would be slight and localized within a relatively small area. The total volume of disturbance or damage to geological and paleontological resources would be hardly perceptible.
- Moderate:** The impact would be readily apparent beneficial or adverse. The impacts would be measurable and perceptible. Adverse actions would change one or more character-defining features of a geological and paleontological resource, but would not diminish the integrity of the resource to a large extent. The total volume of disturbance could still be small, but quite noticeable in local areas, or it could involve a unique or rare resource.
- Major:** The impact would be severe. The adverse impact on geological and paleontological resources would be substantial, noticeable, and permanent. Actions would result in a dramatic change to the resource. The change would be measurable and the amount of disturbance would be large.

The area of analysis for cumulative effects on geological and paleontological resources is defined as northern Arizona, southwestern Utah, and southeastern Nevada.

Impacts to Geology and Paleontology

Impacts to geological or paleontological resources in Parashant would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Wilderness Characteristics
- Vegetation and Fire and Fuels Management
- Visual Resources
- Minerals (Arizona Strip FO only)
- Special Area Designations
- Recreation
- Lands and Realty

Alternative A: No Action

Impacts from Trails and Travel Management

To protect Monument objects identified in the proclamations, including geological and paleontological resources, no areas within the Monuments would be authorized for cross-country, off-road vehicular use except for authorized administrative and emergency purpose. Enforcing this action would reduce erosion, trampling, vandalism, and other surface disturbing impacts that damage geological and paleontological resources. Restricting travel to designated roads would confine physical disturbances to geological and paleontological resources to the area in the immediate vicinity of the designated roads.

The most miles of roads would be open to motorized and mechanized travel under this alternative. And the fewest miles of roads closed to motorized and mechanized travel also occurs under this alternative. Road closures could also affect research by limiting access. The most impacts to geological and paleontological resources associated with motorized and mechanized travel along roads would occur under this alternative. Overall impacts to geological and paleontological resources would be minor.

In the past, visitors have created roads and repeated use has made them permanent. These unapproved roads could be destructive to geological and paleontological resources. Implementing Alternative A would minimize new, permanent roads within the Planning Area, which would protect geological and paleontological resources from further damage. Direct and indirect impacts to geological and paleontological resources would be minor to moderate.

Impacts from Wilderness Characteristics

Under Alternative A, no acres would be allocated for the maintenance of wilderness characteristics.

Impacts from Vegetation and Fire and Fuels Management

Minimal vegetation treatment is proposed under this alternative so there would be no or negligible impacts to geological and paleontological resources from Vegetation and Fire and Fuels Management.

Wildland fire use and prescribed fire would continue and could cause direct and indirect impacts to geological and paleontological resources. Fire could cause the direct destruction of organic fossil remains (e.g., Quaternary packrat middens). The removal of vegetative cover by fire would accelerate erosion and aeolian processes creating short-term indirect impacts. However, these impacts would be negligible compared with similar impacts that occur by natural processes. Fire suppression that involves the use of heavy equipment and the construction of fire

lines creates surface disturbances that could cause direct minor impacts to geological and paleontological resources.

Since wildfires tend to be confined to single-tree events in Vermilion, there would be no or negligible impacts to geological and paleontological resources in that Monument.

Impacts from Visual

Under Alternative A, the most acreage would be allocated for Visual Resources Management (VRM) Class IV, while the least amount of acreage would be allocated for Class I, except for Vermilion where all proposed VRM classification of that Monument is either Class I or Class II. In Parashant and Arizona Strip FO, there would be the greatest potential to disturb the geological strata, paleontological resources, and the view of the geology than under any other alternative due to more acreage classified VRM Class IV. Therefore, impacts could range from negligible to moderate. While VRM Class I and II could help to preserve the geology and paleontology in Vermilion so impacts there could range from negligible to minor.

Impacts from Minerals (Arizona Strip FO only)

Surface disturbing activities authorized by the minerals programs, such as mineral exploration projects and extraction of mineral resources, could result in adverse direct and indirect impacts to geological and paleontological resources. The impacts would be minor to moderate.

Impacts from Special Area Designations (Arizona Strip FO only)

Designation of ACECs to protect critical resources would also benefit geological and paleontological resources by requiring a plan of operations for mineral development and allowing no cross country motorized travel. Impacts would be minor.

Impacts from Recreation

Recreation under Alternative A would maintain emphasis on recreation opportunities associated with motorized vehicle use such as exploring backcountry roads, vehicle camping, sightseeing, and picnicking. Increased visitation under current management would increase surface disturbance and opportunities to directly and indirectly damage resource such that minor impacts could occur to the geological and paleontological resources.

In Arizona Strip FO, greater impacts would occur during competitive events, such as motorized vehicle races and rallies. In the short term, minor impacts would be evident to the geological and paleontological resources; however, moderate impacts could result in the long term.

Impacts from Lands and Realty

Lands and realty actions could acquire surface and subsurface estate, which would bring the estate under the federal protection and benefit geological and paleontological resources.

Land disposed in the Arizona Strip FO would be detrimental to geological and paleontological resources since they would leave federal ownership. Withdrawals restrict certain activities including access, which decreases visitation. This would indirectly benefit geological and paleontological resources since fewer visitors would result in less surface disturbance and fewer opportunities to damage resources. The impacts would be minor.

Surface disturbing activities authorized by the lands and realty programs, such as ROWs and communication sites, could result in adverse direct and indirect impacts to geological and paleontological resources. The impacts could be minor to moderate.

Alternative B

Impacts from Trails and Travel Management

Under Alternative B, the least miles of routes within the Planning Area would be open to motorized use, which is significantly less than the miles that proposed under Alternative A. In addition, the most miles of routes would be closed to motorized and mechanized access. This makes Alternative B the most restrictive for motorized/mechanized access, which would also make it the most successful alternative at reducing opportunities for visitors to cause surface disturbances from motorized use, and thus reduce damage to geological and paleontological resources from such use. Road closures, however, could affect research proposals by limiting access. Direct and indirect impacts would be negligible to minor.

Impacts from Wilderness Characteristics

Under Alternative B, the most acreage would be allocated to maintain wilderness characteristics in the Monuments. In Arizona Strip FO, 46,135 acres would be allocated to maintain wilderness characteristics. The emphasis on naturalness and a focus on reduced motorized visitation within these areas would be beneficial for geological and paleontological resources. Indirect impacts would be negligible to minor.

Impacts from Vegetation and Fire and Fuels Management

Overall impacts would be the same as described under Alternative A.

Impacts from Visual

The greatest amount of acreage proposed for VRM Class I and II would be proposed under this alternative with the least amount of acreage for VRM Class III and IV. This would provide the most additional protection for geological and paleontological resources than any other alternative. Impacts would be negligible to minor.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations

The existing ACECs in Parashant would lose their designation under Alternative B, with no new ones being created. While geological and paleontological resources would lose their protection afforded by the ACECs, similar protection would be afforded by Monument status. As a result, impacts would be negligible. In the Arizona Strip, Alternative B proposes most acreage for ACEC designation, over twice as many acres compared to Alternative A. Therefore, the most protection would also be provided for geological and paleontological resources than under any other alternative. Impacts would be minor.

Impacts from Recreation

Under Alternative B, motorized recreational activities such as driving for pleasure, OHV exploration, geocaching, and dispersed camping would be limited, reducing visitation, and consequently reducing opportunities to create surface disturbances and damage to geological and paleontological resources. Direct and indirect impacts would be minor.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A.

Alternative C

Impacts from Trails and Travel Management

Under Alternative C, significantly fewer miles of routes would remain open for motorized and mechanized use by the public than under Alternative A but more would be open than under Alternative B. Impacts would be similar to those discussed under Alternative B, but not as intense. Direct and indirect impacts would be negligible to minor.

Impacts from Wilderness Characteristics

Under Alternative C, approximately half as many acres would be allocated to maintain wilderness characteristics than under Alternative B in the Monuments. The types of impacts would be the same as described under Alternative B, although not as intense due to the reduced number of acres in the Monuments. Impacts would be minor.

In the Arizona Strip FO under Alternative C, more than twice as many acres are proposed to maintain wilderness characteristics, the most of any alternative. Impacts would be similar to that described under Alternative B, except that they would be more widespread. Impacts would be minor.

Impacts from Vegetation

Impacts would be the same as under Alternative A.

Impacts from Visual

Under Alternative C, more acreage would be allocated to VRM Class III than under Alternative A but less to VRM Class IV. This would provide less protection to geological and paleontological resources than under Alternative B but more than under Alternative A. Impacts would be the same as those described under Alternative A and they would be minor.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be similar to that described under Alternative A.

Impacts from Special Area Designations

Impacts would be the same as described under Alternative B for Parashant and similar to that described under Alternative A for the Arizona Strip FO, albeit slightly more widespread as roughly 5,000 more acres would be under ACEC protection.

Impacts from Recreation

Under Alternative C, motorized recreational activities such as driving for pleasure, OHV exploration, geocaching, and dispersed camping would be less limited than under Alternative B. There would still be a reduction in motorized vehicle use, and consequently reduced opportunities to create surface disturbances and damage to geological and paleontological resources. Direct and indirect impacts would be minor.

In the Arizona Strip FO impacts resulting from competitive events would also be similar to those described under Alternative A.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A.

Alternative D

Impacts from Trails and Travel Management

Under Alternative D, nearly as many miles of routes would remain open to motorized and mechanized use as Alternative A. Overall, Alternative D is the least restrictive alternative in terms of OHV use and would thus result in more localized impacts from such use than the other alternatives. Opportunities for motorized and mechanized vehicle impacts would be greater compared to Alternatives B and C. Road closures could affect research proposals by limiting access but not as much as under Alternatives B and C. The direct and indirect impacts would be minor to moderate.

Impacts from route maintenance/improvement activities would be the same as described under Alternative B. Overall, direct and indirect impacts to geological and paleontological resources would be negligible to minor.

Impacts from Wilderness Characteristics

Under Alternative D, the fewest acres would be allocated for maintaining wilderness characteristics among the action alternatives, which is considerably fewer acres than both Alternatives B and C. The types of impacts would be the same as described under Alternative B, but greatly reduced due to the limited number of acres.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A.

Impacts from Visual

Impacts would be similar to those described under Alternatives A and C.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations

Impacts would be the same as described under Alternative B for Parashant. In the Arizona Strip FO, the least amount of acreage for ACEC designation is proposed under this alternative, thereby, providing less protection to geological and paleontological resources than any of the other alternatives. Impacts would be minor.

Impacts from Recreation

Under Alternative D, fewer limits would be placed on motorized recreational activities (e.g., driving for pleasure, OHV exploration, geocaching) compared to Alternative B and C. This would increase the potential for impacts to geological and paleontological resources. Management of proposed Special Recreation Management Areas (SRMAs) would continue to provide protection to geological and paleontological resources. Direct and indirect impacts would be minor.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A.

Alternative E: Preferred

Impacts from Trails and Travel Management

Under Alternative E, approximately three-quarters the miles of motorized and mechanized routes would remain open and more would be closed than under Alternative A. This would reduce opportunities to create surface disturbances that could damage geological and paleontological resources when compared to Alternatives A and D, but not as much when compared to Alternatives B and C. Road closures could affect research proposals by limiting access, but not as much when compared to Alternatives B and C. The direct and indirect impacts would be minor to moderate.

Impacts from Wilderness Characteristics

Impacts would be similar to Alternative C in the Monuments due to similar number of acres, while impacts would be similar to Alternative D in the Arizona Strip FO.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A.

Impacts from Visual

Under Alternative E, the acreage allocated to VRM classes I and II is slightly less than Alternative B, providing a high degree of protection for geological and paleontological resources. Impacts would be similar as described under Alternative B.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations

Impacts would be the same as described under Alternative A.

Impacts from Recreation

Impacts would be similar to those described under Alternative D.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A.

Cumulative Impacts

Possibly the most significant cumulative impact to geological and paleontological resources in the foreseeable future would be from vandalism. Many of the spectacular or unique geological resources are protected under special area designation, such as wilderness areas or national monuments. As the popularity of these locations increases, so would visitation. Stronger protective measures could be needed to prevent vandalism.

Marking rock exposures with graffiti has occurred in the past. Carving letters or pictures into geologic exposures is expected to occur into the future. Unauthorized OHV use could also substantially impact these resources.

On the Arizona Strip FO, important invertebrate fossils are relatively unknown and vertebrate remains have not been reported. Fossil vertebrate footprints (ichnites) are documented, but their exact locations are not general public knowledge. These resources need to be inventoried. Maintaining open communication with paleontologists including those associated with colleges and universities, organized groups, and professionals could be critical in the protection of these resources.

VEGETATION

Vegetation is a fundamental and vitally important component of the biological resources in the Planning Area. The effects on vegetation resulting from implementing any of the alternatives under consideration would also affect other resources. Impacts to the vegetation resource could result in reduced biological productivity, weed invasion, and unwanted changes in the composition and structure of vegetation communities. These changes, in turn, could influence forage availability for wildlife and livestock. Where actions result in loss or reduction of vegetative cover and/or soil erosion or compaction, archaeological, paleontological, historic, wildlife, water, soil, and air resources could be impacted.

The direct and indirect effects of management actions or uses of vegetation resources may vary widely, depending on a variety of factors such as the type of soils, soil moisture, topography, and plant reproductive characteristics. Direct impacts are generally caused by any construction activities; the establishment, use, maintenance, closing, or rehabilitation of roads and trails; herbivory and livestock trampling; fire ignitions and suppression actions, including blading of fire lines; manual, chemical, mechanical, and biological vegetation treatments, as well as by seeding; and the introduction, spread, and treatment of noxious and invasive weeds. Indirect impacts are generally caused by dust accumulation immediately adjacent to roads and would include lowered vigor or death of plants; changes in plant abundance and/or species composition resulting from modified nutrient cycling due to soil compaction, the accumulation of urine and feces, and soil erosion or deposition associated with livestock; and nutrient modification and soil loss or deposition associated with fire.

Methods and Assumptions

The analysis of potential impacts to vegetation resources is based on the expertise of BLM resource specialists at the Arizona Strip FO and the NPS staffs at Parashant and Lake Mead NRA. Combined, these staffs possess an extensive knowledge of the vegetation resources within the Planning Area. The impact analysis is also based on review of existing literature and information provided by non-planning team experts in the BLM, NPS, and other agencies. The following categories were used to evaluate intensity of the potential impacts on vegetation.

- Negligible:** Generally, negligible impacts are not quantifiable, and therefore not analyzed.
- Minor:** The action would affect some individual native plants and a relatively minor portion of the plant community. The use of standard operating procedures to offset adverse impacts, including special measures, would be required and would be effective.
- Moderate:** The action would affect numerous individual native plants and a sizeable segment of the native plant community over a relatively large area. The use of standard operating procedures to offset adverse impacts, including special measures to

avoid affecting special status plants, animals, and important cultural resources, could be extensive, but would probably be successful.

Major: The action would cause a considerable effect on native plant populations, and the effects would cover a relatively large area. The extensive use of standard operating procedures to offset the adverse effects would be necessary, and their success would not be guaranteed.

Impacts to Vegetation

Impacts to vegetation resources would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Vegetation and Fire and Fuels Management
- Air, Water, and Soil Resources
- Fish and Wildlife
- Special Status Species
- Visual Resources
- Mineral Resources (Arizona Strip FO only)
- Livestock Grazing
- Recreation
- Lands and Realty Management

Alternative A: No Action

Impacts from Trails and Travel Management

Travel on roads would deposit dust on individual plants, which would decrease plant vigor and increase mortality alongside the road. Dust settling on vegetation adjacent to roads would also reduce habitat suitability. Impacts would be minor, indirect, and both short and long term. Due to the number of miles of road open for public use under this alternative, the magnitude of impacts would be greater than under any other alternative.

The construction of new, temporary roads to facilitate project implementation would result in moderate short-term direct impacts to vegetation resources along the construction path. Rehabilitation of closed or temporary roads where use is no longer required would have moderate short- and long-term direct and indirect impacts, depending upon the habitat and the closure method. Direct impacts would include injury or loss of vegetation from crushing. Long-term impacts would result in areas of low rainfall where regeneration is slow. Indirect effects would include dust, erosion, soil compaction, and watershed impacts resulting from the rehabilitation process. Long-term positive effects would occur as vegetation became reestablished.

Impacts from Vegetation and Fire and Fuels Management

Restoration and Vegetation Treatments: Impacts would vary by the method used to accomplish the treatment, whether manual, mechanical, chemical, biological, or fire. Where fuel loads are excessive, failure to conduct vegetation treatments would increase the risk of catastrophic fire, which would put tens of thousands of acres at risk of vegetation loss. Effective ground cover would be greatly reduced, and erosion would be accelerated. Catastrophic fire would also cause major, long-term indirect impacts in terms of wildlife habitat loss and permanent reduction in biomass productivity from erosion.

Following vegetation treatment, increased invasion of noxious weeds and other exotic weed species, decreased water availability, and long-term changes in habitat and species composition could occur. The duration of these effects would vary by treatment method, habitat, and community type, availability of appropriate seed, and amount and timing of precipitation. Vegetation treatment methods are described in Appendix 2.C.

Manual Vegetation Treatments: Compared to other methods, this method would minimize effects to sensitive habitats by retaining more vegetation of non-target species and result in a lower likelihood of erosion, soil instability, sedimentation, or increased surface temperatures. Impacts would be direct and minor.

Mechanical Vegetation Treatments: Use of mechanical tools would reduce canopy cover, increase plant diversity on the forest floor, increase soil moisture due to the reduction of evapotranspiration, and change habitat type. These impacts would be direct, both short and long term, and positively affect some species while negatively affecting others. Long-term, indirect impacts would result from changes in habitat type resulting from the changes in forest density, canopy cover, structure, and the protection and maintenance of forest habitats. Mechanical treatment methods could also result in localized, short-term impacts to air quality from fugitive dust, equipment emission/exhaust, and chemical fumes, which, in turn, could lead to reduced plant vigor and fitness, or mortality among individuals or species.

Biological Vegetation Treatments: Target species would experience direct, short-term impacts due to biological vegetation treatments. Depending upon the biological control agent, a variety of other direct and indirect effects could occur, including mortality of non-target species. As with other vegetation treatment methods, indirect effects would include reduced soil infiltration, increased erosion and sedimentation, increased soil surface temperatures, and short- or long-term changes in species composition and/or community structure.

Chemical Vegetation Treatments: Target and some non-target species would experience direct, short-term impacts, depending upon the chemical used and the application rate. Indirect effects would include reduced soil infiltration, increased erosion and sedimentation, increased

soil surface temperatures, and short- or long-term changes in species composition and/or community structure.

Prescribed Fire, Fire Use, and Management: The intensity of impacts from prescribed fire and fire use depends on the size and intensity of the fire, as well as fuel type and quantity. Impacts from fires that cause injury or loss of individual plants and an increase in soil moisture due to the reduction of evapotranspiration would be short term and minor. Impacts from fires that change species composition, plant density, and vegetative structure, and increases the abundance of non-native evasive, fire-adapted plant species would be direct, major, and both short and long term. Reduction in biomass productivity due to accelerated erosion resulting from the reduction in effective ground cover, as well as reduced habitat suitability for seed dispersers, would represent indirect, major impacts.

Fire Suppression: Direct impacts from the removal of vegetation from hand-line construction would be short term and minor. Impacts from using aerially-applied retardant as an alternative to hand-line construction would be negligible. Most impacts from fire suppression activities would be minor, short-term, and localized, particularly if activities in sensitive habitats are mitigated or avoided. Impacts in the arid desert-scrub communities may be longer term, since these vegetation communities do not recover as readily.

Control of Noxious Weeds: Impacts depend upon the method used. Direct impacts to the target species from manual techniques and herbicide applications would range from minor to moderate, with some non-targets experiencing impacts in the short-term. Eradication of noxious weed species and improved species composition for the remaining community would occur over the long term.

Collection and Use of Native Seed/Use of Non-native plants: In Parashant, collection and use of native seed could be authorized. Collection of native seed could result in localized, minor short-term impacts to vegetation from trampling, loss of individuals, reduction in seed availability at the collection site, and potential reduction in plant vigor. The availability of local native seed would result in moderate indirect long-term impacts, which include improved ability to achieve Desired Future Conditions (DFCs) by improving the species composition in areas needing vegetation treatments.

If certain conditions are met, non-native plant species could be used in treatment/restoration efforts. The major short-term direct impact from the use of nonnative plant species is the stabilization of soils following disturbance when native species are ineffective, cannot be established, or are not available. The major short and long-term indirect impacts from use of nonnative plant species for re-seeding would be an undesirable change in species composition, resulting from introducing species that could out-compete natives and/or increase the frequency or intensity of wildfire.

Vegetation Products Use/Sale: In Parashant, use and/or sale of vegetation products would have localized, minor to moderate impacts on vegetation resources. Indirect effects would include reduced soil infiltration, increased erosion and sedimentation, increased soil surface temperatures, and short- or long-term changes in species composition and/or community structure. Impacts resulting from fuelwood harvest associated with restoration projects could lead to long-term or permanent changes in vegetative community structure or dynamics.

The use and/or sale of vegetation products would not be authorized in Vermilion. Impacts from free and non-commercial use of these products would be similar in scope and extent to those described for Parashant.

In the Arizona Strip FO, use and/or sale of vegetation products would have localized, minor to moderate impacts on vegetation resources, particularly harvest of fuelwood associated with restoration projects, post cutting, collection of dead and downed wood for campfires, Christmas tree harvest, and collection of pinyon nuts. Indirect effects would include reduced soil infiltration, increased erosion and sedimentation, increased soil surface temperatures, and short or long-term changes in species composition and/or community structure. Impacts resulting from fuelwood harvest associated with restoration projects could lead to long term or permanent changes in vegetative community structure or dynamics. Salvage of vegetation that would be destroyed through surface disturbing activities would not be authorized in the planning area under this alternative.

Impacts from Air, Water, and Soil Resources

Direct impacts from soil stabilization and reclamation projects that reestablish native vegetation on the disturbed area would be both short and long term. Indirect impacts would include increased effective ground cover, reduced erosion and compaction, and increased infiltration, which could become long term due to increased vegetation productivity and improved wildlife habitat and connectivity. All impacts would be minor.

Construction of water retention structures would directly increase sheet erosion and reduce gully and rill erosion. These impacts would be short term and minor. The area of disturbance would vary by the action proposed, but generally would average less than five acres per structure.

Impacts from Fish and Wildlife

Implementation of habitat management plans (HMPs) which specify vegetation treatments to improve habitat would involve removing individual plants and altering species composition and vegetation structure. Impacts would vary by treatment method used (see discussion above on Impacts from Vegetation Resources above)

Direct impacts due to foraging by newly transplanted big game animals may be long term and minor. Transport methods could introduce sources of noxious weeds.

Constructing new water developments would permanently remove vegetation within the footprint of the structures. Impacts would be direct, long term, and minor. Surrounding vegetation could be injured or damaged temporarily, but would likely recover. Increased use of the area by wildlife species not previously present would increase foraging pressure on desirable species. This could result in increased or decreased vigor to the plants depending upon the species and their phenology. Water from the development may leak or spill, resulting in short- or long-term changes in vigor and/or species composition. On average, the disturbance area for each water development is two acres. Under Alternative A, as many as 20 new wildlife water developments would be built within the life of this Plan, which could permanently alter vegetation resources on up to 40 acres.

Each year, approximately 10 wildlife water developments would be inspected and maintained in the Monument, which would result in similar disturbances to vegetation resources as described for new developments.

In Vermilion, as many as six new wildlife water developments could be built throughout the life of this Plan. The average size of the disturbance area is less than two acres each. As much as 12 acres of vegetation resources could be permanently altered by construction of new artificial water sources.

Maintenance of water developments would result in minor disturbance impacts to vegetation resources similar in scope and nature to those described for new developments. Six or more wildlife water developments each year are inspected and maintained in Vermilion.

In the Arizona Strip FO, as many as 20 new wildlife water developments would be built throughout the life of this Plan. The average size of the disturbance area is less than two acres each. As much as 40 acres of vegetation resources could be permanently altered by construction of new artificial water sources.

Maintenance of water developments would result in minor disturbance impacts to vegetation resources similar in scope and nature to those described for new developments. Approximately 30 wildlife water developments each year are inspected and maintained in the Arizona Strip FO.

In Parashant, increased visitation resulting from the management of the Mt. Trumbull Watchable Wildlife area would directly affect vegetation in the area due to disturbance, trampling, and compaction. Impacts would be minor and both short and long term. The latter would occur due to reduced biomass productivity caused by compaction.

Impacts from Special Status Species

Impacts from special status species transplants would be similar to those described for transplants of wildlife species in the above section, Impacts from Fish and Wildlife.

Restrictions on vegetation treatments in special status species habitats (e.g., desert tortoise or special status plants) would reduce or eliminate potential impacts to vegetation from treatment projects. Impacts would vary with the type of treatment proposed and the nature and extent of the restrictions. Failure to implement vegetation treatments in these habitats could result in direct and indirect, long-term impacts to vegetation, especially treatments to control noxious weeds.

Restricting authorized uses for special status species would reduce or eliminate disturbances that would otherwise have affected vegetation. Impacts would be direct, long term, and minor.

Closing and rehabilitating roads would increase plant vigor and reduce mortality alongside the road by reducing dust on individual plants. Impacts would be indirect, minor, and both short and long term. Compaction would also be eliminated along the closed/rehabilitated route, which would increase infiltration, reduce erosion, and ultimately improve ground cover, causing a further reduction in erosion, increase in biomass productivity and vegetative structure, and an improvement in wildlife habitat attributes. These impacts would be indirect, long term, and major.

Impacts from Visual Resources

Implementing VRM guidelines would increase the difficulty of accomplishing vegetation management actions and limit the extent and/or effectiveness of the restoration efforts. Vegetation treatment projects would generally not occur in VRM Class I areas, which would cover about 14 percent of the Monument under Alternative A. Vegetation treatment, restoration, and weed treatment projects on 41 percent of the Monuments within VRM Class II areas could be redesigned, moved, or otherwise restricted. See discussion on restoration and vegetation treatments in the Impacts from Vegetation and Fire and Fuels Management section above for a discussion of impacts.

Impacts from Minerals (Arizona Strip FO only)

In the Arizona Strip FO, Impacts to vegetation resources from minerals management actions could result from locatable mineral development, oil and gas development, and/or mineral material sales/disposal. Impacts associated with these actions would include loss or injury of plants due to excavation or trampling, burial under piles of waste material, toxic responses from use of chemicals in mineral extraction or waste pits, and increased exposure to dust and other contaminants associated with construction and use of access roads. In the worst case scenario, all vegetation would be removed from a parcel of land and the site would be permanently altered so as to prevent future vegetation growth. This represents minor to moderate long-term impacts depending upon the size and location of the parcel and the occurrence of rare plant species. Parcels that include listed threatened, endangered, or proposed species would be subject to consultation with the U.S. Fish and Wildlife Service.

Impacts from Livestock Grazing

Livestock grazing can directly affect vegetation by reducing plant vigor, decreasing or eliminating desirable forage species, increasing soil instability and erosion, reducing water quantity and quality, and losing or injuring individual plants from trampling, particularly near water developments. Impacts would be both short and long term and range from minor to major, depending upon the grazing intensity, duration, and season of use, and local climatic conditions. Long-term changes in vegetation may result where livestock use consistently exceeds established allocations, or drought or other environmental factors reduce range carrying capacity. Over grazing may lead to soil compaction, reduced infiltration rates, increased runoff and erosion, and declines in watershed condition. Livestock grazing may also increase the opportunity for exotic plant species and noxious weed infestations. Season of use restrictions may lessen the effects of grazing, particularly if grazing occurs during the non-growing season.

Under Alternative A, five allotments would be subject to full closures, which would prevent livestock from grazing on 199,350 acres, indirectly affecting vegetation in these areas over the long term. Impacts would range from minor to moderate as vegetation in these areas may or may not regenerate, depending upon the timing and duration of grazing and the extent of long-term changes in species composition, localized erosion, and soil compaction.

Managing the BLM portion of the Parashant Allotment as a forage reserves would have similar impacts to those described above for livestock grazing, except that grazing would occur less frequently. Livestock and permittees would be less familiar with the location of waters, forage areas, and other developments, resulting in more widespread, but less intensive impacts.

Construction or maintenance of range water developments would have similar impacts to those described above for wildlife water developments. Water developments concentrate livestock use and reduce or eliminate vegetation in the immediate vicinity and increase compaction and erosion, which would lead to decreased biological productivity. For a typical reservoir or catchment, such impacts would occur within six acres, on average, though effects may be noticeable within a radius of one-quarter mile from the water development. Impacts would be minor and long term. As many as 30 new range water developments could be built over the life of this plan, resulting in impacts to 180 acres. Abandonment or removal of watering facilities would result in minor long-term indirect impacts to vegetation. As the biomass of vegetation increases the effective ground cover increases, erosion decreases, infiltration would increase. Maintenance of the 639 existing range water developments would have similar impacts to those described above for maintenance of artificial water sources. Most, if not all, of the existing waters would be inspected at least once over the life of this plan. As many as 100 of these waters could be repaired, rebuilt, or replaced.

In Vermilion, all available lands would be open to livestock grazing, which means that impacts could potentially occur on all lands within the Monument.

Construction or maintenance of range water developments would have similar impacts to those described above for artificial water sources. As many as six new range water developments could be built over the life of this plan, resulting in impacts to 36 acres. Most, if not all, of the 174 existing waters would be inspected at least twice over the life of this plan. As many as 30 of these waters could be repaired, rebuilt, or replaced.

Impacts from Recreation

Impacts to vegetation resources from maintenance or restoration of natural remote settings would vary depending upon ecological zone and the method used to conduct the restoration. Impacts would be the same as those described above under Impacts from Vegetation and Fire and Fuels Management. The restriction of vegetation management treatments on vegetation resources could result in minor to moderate short and long-term impacts of risk of vegetation loss to catastrophic fire. Encroachment of undesirable species in some areas would continue unchecked.

Commercial recreation or competitive events would result in direct, minor, short-term impacts to vegetation, which include the introduction or spread of noxious weeds and trampling of individual plants. Vehicular events have the greatest potential to impact vegetation. The increase in dust associated with many of these activities could lead to a reduction in vigor or mortality of many individuals. While the No Action Alternative includes provisions to alter recreational activities that affect sensitive areas or species, such provisions would not be enforced until after monitoring had detected the impacts.

Sightseeing and recreational driving would result in minor, short and long-term indirect impacts to vegetation which would include decreased plant vigor and increased mortality alongside the road, resulting from dust being deposited on individual plants. Direct, minor, short-term impacts to vegetation would result from foot traffic through sensitive areas which could trample, injure, or kill vegetation. Camping increases the likelihood of such effects. Collection of dead and down wood for firewood would increase the extent and severity of impacts to vegetation.

Impacts from Lands and Realty

Impacts to vegetation resources could result from issuance of ROWs necessary for access and/or maintenance needs to private or state inholdings, ROWs within the boundaries of existing ROWs or designated corridors, and where site-specific NEPA analysis determines that impacts to Monument objects or values would be negligible.

Impacts from issuance of ROWs would vary upon the nature and purpose of the ROWs. Impacts would be minor as any new ROWs or associated actions that had more than a negligible impact on Monument objects or values would not be authorized.

In Arizona Strip FO, impacts to vegetation resources could result from disposal of property, ROWs, or issuance of special use permits. Impacts associated with disposal of federal lands would depend upon the use of those lands by future owners. In the worst case scenario, all vegetation would be removed from a parcel of land and the site would be paved or otherwise permanently altered so as to prevent future vegetation growth. This represents minor to moderate long-term impacts depending upon the size and location of the parcel and the occurrence of rare plant species. Parcels that include listed threatened, endangered, or proposed species would not be available for disposal. This alternative includes more acres available for disposal than under any other alternative. Therefore, effects could occur over a larger area.

Impacts from issuance of ROWs would vary upon the nature and purpose of the ROWs. Impacts to vegetation would generally be minor to moderate and would be addressed in site-specific NEPA analysis.

Impacts from issuance of special use permits would vary with the nature and purpose of the permit. Impacts to vegetation would generally be negligible to minor and would be addressed in site-specific NEPA analysis.

Alternative B

Impacts from Trails and Travel Management

Impacts to vegetation resources would be the same as those described under Alternative A. However, due to the increase in number of miles of roads closed or open for administrative use only, impacts would occur over a smaller area than under any other alternative.

Impacts from Vegetation and Fire and Fuels Management

The types of impacts would be similar to those described under Alternative A, with the following exceptions and additions:

Using DFCs and desired plant community (DPC) objectives to make decisions would enhance protection of sensitive resources and benefit uses by emphasizing consideration of those uses in planning. Employing seasonal restrictions on uses would also benefit vegetation resources. Identifying ecological zones with unique DFCs, DPCs, and vegetation management actions would increase management capabilities.

Collection and Use of Native Seed/Use of Non-native Plants: Impacts from the collection of native seeds would be the same as described under Alternative A, although they would also apply to the Arizona Strip FO. Impacts from the use non-native species in treatment efforts would be the same as those described under Alternative A.

Riparian Ecological Zone: Managing the Riparian Ecological Zone for minimum disturbance would result in moderate to major indirect, long-term impacts. The only vegetative treatment authorized would be fire use. This would promote the expansion of non-native, fire adapted plant species such as tamarisk and cheat grass. Such impacts would include loss of diversity, increased evapotranspiration, increased ambient temperature, reduced available surface and subsurface water, increased salinity, and increased fire frequency.

Pakoon Springs Restoration: The major, indirect long-term impacts of restoring Pakoon Springs (in Parashant) without the use of vegetation treatments would be the continued proliferation of noxious weeds and exotic wildlife species. The DFCs would probably not be attainable without intervention.

Cane Springs Restoration: Removal of livestock in Cane Springs (in Parashant) would result in minor to moderate long-term indirect impacts to vegetation. As the biomass of vegetation increases, the effective ground cover would increase, erosion would decrease, and infiltration and biological productivity should increase. Species composition may not improve if desirable forage species have been locally extirpated by grazing and are not re-introduced.

In Vermilion and the Arizona Strip FO, no vegetation treatments would be planned or authorized in the Riparian Ecological Zone, except that fire use would be an option. This would promote the expansion of non-native, exotic plant species such as tamarisk. Impacts would include loss of diversity, increased evapotranspiration, increased ambient temperature, reduced available surface and subsurface water, increased salinity, and increased fire frequency.

Ponderosa Pine Ecological Zone: In Parashant, the impacts of vegetation treatments in the ponderosa pine ecological zone would be direct, moderate, and both short and long-term. Opening the canopy would result in more sunlight reaching the forest floor, an increase in soil moisture, and would reduce the risk of catastrophic fire. Indirect impacts would be an increase vegetative vigor and understory species diversity, and the maintenance of this unique habitat. Impacts would occur on fewer acres under this alternative than for any other.

Impacts from Ponderosa pine restoration efforts in the Mt. Trumbull Wilderness would be similar to those described for manual treatments under Alternative A. Impacts would occur on fewer acres under this alternative than for any other.

In the Arizona Strip FO, no vegetation treatments would be planned in this ecological zone under this alternative. Therefore, impacts would include an increased risk of catastrophic or stand-replacement fire.

Great Basin Ecological Zone: Impacts from treatment of sagebrush communities in this ecological zone would be similar to those described under Alternative A. Impacts would occur on fewer acres under this alternative than for any other.

Impacts from treatment of pinyon-juniper communities in this ecological zone would be similar to those described for vegetation treatments and prescribed fire, fire use, and management under Alternative A. Impacts would occur on fewer acres under this alternative than for any other.

In Vermilion, no vegetation treatments would be planned or authorized in sagebrush communities. Fire use would be an option. Impacts from vegetation treatments in pinyon-juniper communities would be the same as those described for chemical and mechanical vegetation treatments and prescribed fire, fire use and management under Alternative A. Impacts could occur over the smallest area under this alternative than with any other alternative.

In the Arizona Strip FO, impacts from treatment of sagebrush communities would be similar to those described for chemical vegetation treatments under Alternative A. Impacts from treatment of pinyon-juniper communities in this ecological zone would be similar to those described for chemical treatments and prescribed fire, fire use and management under Alternative A. Impacts would occur on fewer acres under this alternative than for any other.

Mojave Desert Ecological Zone: No vegetation treatments would be planned in this ecological zone. Impacts to vegetation would be the continued expansion of cheat grass, and other impacts similar to those described for fire suppression, use, and management under Alternative A.

Mojave-Great Basin Transition Ecological Zone: No vegetation treatments would be planned in this ecological zone, though fire use could still be authorized. Impacts to vegetation would be the continued expansion of cheat grass, and other impacts similar to those described in the Fire Suppression under Alternative A.

Interior Chaparral Ecological Zone: No vegetation treatments would be conducted. The continued maturation of interior chaparral sites would lead to a reduction in bare ground space, reduction in diversity, and increased risk of high intensity fire.

Plains - Grassland Ecological Zone: No vegetation treatments would be conducted, except that fire use could be considered. Impacts to vegetation would be the continued expansion of cheat grass, and impacts similar to those described in the Fire Suppression, Use, and Management section under Alternative A.

Colorado Plateau Transition Ecological Zone: In Vermilion, no vegetation treatments would be planned in this ecological zone, though fire use could still be authorized. Impacts to vegetation would be would be similar to those described under Alternative A.

Impacts from Air, Water, and Soil Resources

Impacts would be similar to those described under Alternative A. However, in Parashant, salvage and replanting to mitigate impacts of authorized uses would have minor direct short and long-term impacts on vegetation by improving effective ground cover and vegetative structure,

and minor indirect long-term impacts by increasing infiltration, improving biomass productivity and providing wildlife habitat attributes.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative A.

Impacts from Special Status Species

Impacts to vegetation resources would be similar to those described under Alternative A, with the following exceptions:

In Parashant, not authorizing mechanical treatments in special status species habitats would reduce or eliminate potential impacts to vegetation from the treatment such as trampling, loss of individuals, reduction in vigor, increased risk of invasion of noxious weeds, alteration of local micro-climate conditions that could affect species composition and distribution, increased soil movement, and susceptibility to erosion.

Introducing special status aquatic species at Pakoon Springs or other locations within Parashant could have moderate long-term direct and indirect impacts on vegetation if treatments to improve or maintain species composition and/or control noxious weeds are restricted because of the presence of the special status species.

In the Arizona Strip FO, mechanical treatments would not be authorized in special status species habitats. This would reduce or eliminate potential adverse effects from the treatment to vegetation such as trampling, loss of individuals, reduction in vigor, increased risk of invasion of noxious weeds, alteration of local micro-climate conditions that could affect species composition and distribution, increased soil movement, and susceptibility to erosion.

Impacts from Visual Resources

The types of impacts to vegetation resources would be the same as those described under Alternative A. In Parashant, since no areas would be identified as VRM Class III and only 12 acres in Class IV, there would be no locations where proposed projects could be relocated. Fewer projects would thus be authorized. This could slow or preclude achievement of DFCs. In the Arizona Strip FO, since 1,379,468 acres would be identified as VRM Class III and 72,803 acres in Class IV, there would be various locations where proposed projects could be relocated. These projects could assist in achieving DFCs.

Impacts from Minerals (Arizona Strip FO only)

In the Arizona Strip FO, impacts to vegetation resources would be the same as described under Alternative A, except that additional protections would be implemented to protect vegetation in sensitive areas.

Impacts from Livestock Grazing

The types of impacts would be similar to those described under Alternative A, although impacts would occur over a smaller area. In Parashant, 153,029 fewer acres would be available for grazing by livestock due to the closing of six allotments. Impacts from elimination of grazing on these allotments would be the same as described under Alternative A. Seasonal restrictions on allotments and acres would also reduce impacts compared to Alternative A. In Vermilion, 15,610 acres would not be available for livestock grazing, and impacts would not occur on these lands. In the Arizona Strip FO, up to 124,160 acres would be closed to livestock grazing. Therefore, vegetation resources would be impacted over fewer acres.

Impacts from Recreation

Impacts to vegetation resources would be similar to those described under Alternative A. Additional impacts would occur in Parashant due to the construction of recreation infrastructure, such as visitor kiosks and interpretive signs, which would result in direct, minor, long-term impacts by permanently removing vegetation within the footprint of the structures and injuring surrounding vegetation. Indirect, minor, long-term impacts would result from compaction caused by visitor use, reduced infiltration, increased erosion, increased likelihood of fire, and reduction in biological productivity.

Impacts from Lands and Realty

Impacts to would be the same as those described Alternative A, with the exception that in the Arizona Strip FO, fewer acres would be available for disposal under this alternative thus reducing the total area of impact.

Alternative C

Impacts from Trails and Travel Management

The types of impacts would be similar to those described under Alternative A, although the magnitude of impacts would be less under Alternative C due to the reduced number of roads open for public use, but greater when compared to Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Impacts to vegetation resources would be similar to those described under Alternatives B, with the following exceptions:

Riparian Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described for chemical treatments and prescribed fire, fire use, and management under Alternative A. Impacts would occur on fewer acres under this alternative than for any other in the Arizona Strip FO.

Pakoon Springs Restoration: Restoration of processes and function at Pakoon Springs would result in minor, short-term direct impacts include injury, mortality, or removal of individual plants or species. Major, long-term indirect impacts could include increased biomass productivity, and improvement of wildlife habitat for target species.

Tassi Ranch and Springs Restoration: Restoration actions at Tassi Springs would result in minor, short-term direct impacts include injury, mortality, or removal of individual plants or species. Major, long-term indirect impacts could include increased biomass productivity, and improvement of wildlife habitat for target species. Introduction of relict leopard frogs or other special status species could limit use of restoration tools that would result in adverse effects to the species and could delay restoration.

Cane Springs Restoration: Vegetation resources would benefit from closing Cane Springs to grazing by mitigating or eliminating impacts from livestock grazing. Developing an interpretive site could result in minor, short- and long-term impacts to vegetation by increasing visitation to the site, which would result in increased disturbance and trampling, compaction and minor erosion of pathways and trails, and increased likelihood of fire.

Paria River Invasive Plant Species Removal: Impacts from Paria River invasive plant species removal in Vermilion would be the same as those described for prescribed fire, fire use, and management and for chemical treatments under Alternative A. Impacts could occur over a larger area under this alternative than under Alternative B, but less than all other alternatives.

Ponderosa Pine Ecological Zone: In Parashant, impacts would be the same as those described for each of the various treatment methods under Alternative A. Impacts could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

Mt. Trumbull Wilderness: Impacts would be the same as those described for prescribed fire, fire use, and management and manual vegetation treatments under Alternative A. Impacts could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

In the Arizona Strip FO, impacts from vegetation treatments in this ecological zone would be similar to those described for each of the various treatment methods under Alternative A. Impacts would occur on fewer acres with the exception of Alternative B.

Great Basin Ecological Zone: Impacts from vegetation treatments in sagebrush communities would be the same as those described for chemical treatments and prescribed fire, fire use, and management under Alternative a. Impacts would occur on fewer acres with the exception of Alternative B.

Impacts from vegetation treatments in pinyon-juniper communities would be the same as those described for chemical and mechanical treatments and prescribed fire, fire use, and management under Alternative A. Impacts to pinyon-juniper communities would occur on fewer acres with the exception of Alternative B.

Mojave Desert Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described for chemical treatments under Alternative A. Impacts would occur on fewer acres with the exception of Alternative B.

Mojave-Great Basin Transition Ecological Zone: In Parashant, impacts from vegetation treatments in this ecological zone would be the same as those described for chemical treatments under Alternative A. Impacts to this ecological zone could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

Interior Chaparral Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described for mechanical and chemical treatments under Alternative A. Impacts to this ecological zone could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

Plains-Grassland Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described for prescribed fire, fire use, and management and for mechanical and chemical treatments under Alternative A. Impacts could occur over a larger area under this alternative than under Alternative B, but less than all other alternatives from vegetation treatments in this ecological zone

Colorado Plateau Transition Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described for the various treatment methods under Alternative A. Impacts would occur on fewer acres with the exception of Alternative B.

Impacts from Soil, Water and Air Resources

Impacts would be similar to those described under Alternative B.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative A, with the exception that the extent of the impacts from Watchable Wildlife areas would be more widespread in Parashant due to the increase for four additional areas, and more widespread in the Arizona Strip FO due to five additional areas. Impacts from Watchable Wildlife areas would also be experienced in Vermilion as one would such area would be identified under Alternative C.

Impacts from Special Status Species

Impacts would be similar in nature and scope to those described under Alternative B, with the following exceptions:

In Parashant, introduction of relict leopard frogs or other special status species at Pakoon Springs and/or Tassi Springs and Ranch could limit use of restoration tools that would result in adverse effects to the species and could delay restoration.

Burrowing Owl: In Parashant, augmenting existing burrowing owl populations and installing artificial nest burrows in the Pakoon Basin would have minor short term direct impacts to local vegetation including removal or trampling of individual plants. These impacts would not likely exceed two acres for each group of 16 burrowing owls released, or less than 10 acres total over the life of the plan.

In the Arizona Strip FO, augmenting existing burrowing owl populations and installing artificial nest burrows would have minor short term direct impacts to local vegetation including removal or trampling of individual plants. These impacts would not likely exceed two acres for each group of 16 burrowing owls released, or less than 20 acres total over the life of the plan.

Impacts from Visual Resources

Impacts would be similar in nature and scope to those described under Alternative A, with the following exceptions: In Parashant, more acres would be managed under VRM Class III and IV, allowing for additional vegetation treatments and other impacts to vegetation. In Vermilion, with more areas open in VRM Classes III and IV, vegetation treatment, restoration, and weed treatment projects could be authorized with fewer restrictions. In the Arizona Strip FO, more acres would be included in VRM Classes III and IV. Therefore, more areas would be available for vegetation treatments and impacts to vegetation resources could occur over a larger area.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

Impacts would be similar in nature and scope to those described under Alternative A. However, in Parashant, impacts would occur over a larger area and over a longer period than under Alternative B due to an increase in the size and/or season of use of areas open to livestock grazing. In Vermilion, some 15,610 acres would be available for seasonal livestock grazing only. The duration of impacts in these areas would be shorter. In the Arizona Strip FO, the inclusion of additional acreage with seasonal grazing restrictions would result in impacts of shorter duration over that portion of the range.

Impacts from Recreation

Impacts would be similar in nature and scope to those described under Alternative A. In addition, in Parashant, developing interpretive sites could result in minor, short and long-term impacts to vegetation by increasing visitation to the site, in increased disturbance and trampling, compaction and minor erosion of pathways and trails, and increased likelihood of fire.

Impacts from Lands and Realty

Impacts would be similar in nature and scope to those described under Alternative A, with the exception that slightly more acres would be available for disposal in the Arizona Strip FO under this alternative, and also more than proposed under Alternative B.

Alternative D

Impacts from Trails and Travel Management

Types of impacts would be similar to those described under Alternative A. Alternative D proposes fewer miles of roads closed and more miles open than any other alternative except Alternative A. As a result, impacts would occur over a larger area than other alternatives except Alternative A.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be similar to those described under Alternatives B, with the following exceptions:

Riparian Ecological Zone: In Parashant, impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A, under each of the various treatment methods. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Pakoon Springs Restoration: Impacts would be similar to those described under Alternative C. Developing an interpretive site could result in minor, short- and long-term impacts to vegetation

by increasing visitation to the site, in increased disturbance and trampling, compaction and minor erosion of pathways and trails, and increased likelihood of fire.

Tassi Springs and Ranch Restoration: Impacts would be similar to those described under Alternative C.

Cane Springs Restoration: Impacts would be similar to those described under Alternative C.

Paria River Invasive Plant Species Removal: Impacts would be the same as those described under Alternative A, as described for each treatment method. Impacts could occur over a larger area than for any other alternative

In the Arizona Strip FO, impacts would be similar to those described under Alternative A for the various treatment methods. Impacts would occur on more acres under this alternative than for any other.

Ponderosa Pine Ecological Zone: In Parashant, impacts would be the same as those described under Alternative A for each of the various treatment methods. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Mt. Trumbull Wilderness: Impacts would be the same as those described under Alternative A for prescribed fire, fire Use, and management and manual treatments. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

In Arizona Strip FO, impacts from vegetation treatments in this ecological zone would be similar to those described under Alternative A for each of the various treatment methods. Impacts would occur on more acres under this alternative than for any other

Great Basin Ecological Zone: Impacts from vegetation treatments in sagebrush communities would be the same as those described for chemical treatments and prescribed fire, fire use, and management under Alternative A. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Impacts from vegetation treatments in pinyon-juniper communities would be the same as described under Alternative A for chemical treatments, mechanical treatments, and prescribed fire, fire use and management. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Mojave Desert Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for chemical and biological

treatments. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Mojave-Great Basin Transition Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for chemical and biological treatments. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Interior Chaparral Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described for mechanical, chemical, and biological treatments. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Plains-Grassland Ecological Zone: Impacts from vegetation treatments in this ecological zone would be the same as those described under A for mechanical, chemical, and biological treatments. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Colorado Plateau Transition Ecological Zone: In Vermilion and Arizona Strip FO, impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the each various treatment methods. Impacts could occur over a larger area than for any other alternative.

Impacts from Soil, Water and Air Resources

Impacts would be similar to those described under Alternative A.

Impacts from Fish and Wildlife

Impacts to would be the same as described under Alternative C.

Impacts from Special Status Species

Impacts to vegetation resources would be the same as those described under Alternatives A, with exception, with the exception that augmenting existing burrowing owl populations and installing artificial nest burrows in the Arizona Strip FO would have the same effects as those described under Alternative C.

Impacts from Visual Resources

The types of impacts would be similar to those described under Alternatives A. However, in Parashant, the number of acres managed as VRM Class III would be the larger than under any other alternative. More acres could be restored or treated. Therefore, impacts to vegetation resources would be greater than under other alternatives. In Vermilion, no acres for VRM Class III are identified in Alternatives B, D, and E. Alternative C, however, identifies 625 acres in

VRM Class III. In the Arizona Strip FO, more acres would be included in VRM Classes III and IV. Therefore, more areas would be available for vegetation treatments and impacts to vegetation resources could occur over a larger area.

Impacts from Minerals (Arizona Strip FO only)

Impacts to vegetation resources would be the same as described under Alternatives A.

Impacts from Livestock Grazing

Impacts would be similar in nature and scope to those described under Alternative A. In Parashant, impacts would occur over a larger area and over a longer period than for Alternatives B and C due to an increase in the size and/or season of use of areas open to livestock grazing. In Vermilion, some 13,238 acres would be available for seasonal livestock grazing only. The duration of impacts in these areas would be shorter. In the Arizona Strip FO, the inclusion of additional acreage with seasonal grazing restrictions would result in impacts of shorter duration over that portion of the range. Impacts would occur over a larger area and longer time period than for other alternatives except Alternative A.

Impacts from Recreation

Impacts would be similar in nature and scope to those described under Alternative A.

Impacts from Lands and Realty

For the Monuments, impacts would be similar in nature and scope to those described under Alternative A. However, in the Arizona Strip FO, slightly more acres would be available for disposal under this alternative, and also more than in Alternative B.

Alternative E: Preferred

Impacts from Trails and Travel Management

Impacts would be similar to those described under Alternative A. In Parashant, due to the increase in miles of road open for public use under this alternative, the magnitude of impacts would be greater than for Alternatives B, and C, but less for Alternatives A and D. In Vermilion, this alternative includes more miles of roads closed and fewer miles open than Alternatives A and D. As a result, the magnitude of impacts would be less than that of Alternatives A and D, but greater than Alternatives B and C. In the Arizona Strip FO, due to the increase in number of miles of roads open and a decrease in miles closed, impacts would occur over a larger area than other alternatives except Alternative A.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be similar to those described under Alternative B, with the following exceptions:

Riparian Ecological Zone: In Parashant, impacts would be the same as those described under Alternative A, as described for each treatment method. Impacts could potentially occur on more acres than would be authorized under Alternative B, but less than Alternatives A and D.

Pakoon Springs Restoration: Impacts would be similar to those described under Alternative D.

Tassi Springs and Ranch Restoration: Impacts would be similar to those described under Alternative C.

Paria River Invasive Plant Species Removal Impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for each treatment method. As with Alternative D, impacts could occur over a larger area than for any other alternative.

Ponderosa Pine Ecological Zone: In Parashant, impacts would be the same as those described under Alternative A, as described for each of the various treatment methods. Impacts could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

Mt. Trumbull Wilderness: Impacts would be the same as those described under Alternative A for manual treatments and prescribed fire, fire use, and management,. Impacts could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

Great Basin Ecological Zone: Impacts from vegetation treatments in sagebrush communities would be the same as those described under Alternative A for chemical treatments and prescribed fire, fire use, and management. Impacts to sagebrush communities in Parashant could occur within the same area as under Alternative C, while Impacts in Vermilion and Arizona Strip FO would occur within the same area as under Alternative D.

Impacts to pinyon-juniper communities would be the same as those described under Alternative A for chemical and mechanical treatments and prescribed fire, fire use, and management. Impacts to pinyon-juniper communities in Parashant could occur within the same area as under Alternative C, while Impacts in Vermilion and Arizona Strip FO would occur within the same area as under Alternative D.

Mojave Desert Ecological Zone: Impacts would be the same as those described under Alternative A for chemical treatments. Impacts to this ecological zone in Parashant could occur

within the same area as under Alternative C, while impacts in the Arizona Strip FO would occur within the same area as under Alternative D.

Mojave-Great Basin Transition Ecological Zone: Impacts would be the same as those described under Alternative A for chemical treatments. Impacts to this ecological zone in Parashant could occur within the same area as under Alternative C, while impacts in the Arizona Strip FO would occur within the same area as under Alternative D.

Interior Chaparral Ecological Zone: Impacts would be the same as those described under Alternative A for mechanical and chemical treatments. Impacts to this ecological zone in Parashant could occur within the same area as under Alternative C, while impacts in the Arizona Strip FO would occur within the same area as under Alternative D.

Plains-Grassland Ecological Zone: Impacts would be the same as those described under Alternative A for mechanical and chemical treatments. Impacts to this ecological zone could occur over the same area as under Alternative D.

Colorado Plateau Transition Ecological Zone: Impacts would be similar to those described under Alternative A for the various treatment methods used. Impacts to this ecological zone could occur over the same area as under Alternative D.

Impacts from Soil, Water and Air Resources

Impacts would be the same as those described under Alternative A.

Impacts from Fish and Wildlife

Impacts would be the same as described under Alternative C.

Impacts from Special Status Species

Impacts would be the same as those described under Alternative A, with exception that augmenting existing burrowing owl populations and installing artificial nest burrows in the Arizona Strip FO would have the same effects as those described under Alternative C.

Impacts from Visual Resources

For Parashant, impacts would be the same as those described under Alternative C. For Vermilion, impacts would be the same as described under Alternative A, although with more areas open in VRM Classes IV, vegetation treatment, restoration, and weed treatment projects could be authorized with fewer restrictions. For the Arizona Strip FO, impacts would be similar to those described under Alternative D. For all three planning areas under this alternative, VRM Class I is restricted to designated and proposed wilderness areas only.

Impacts from Minerals (Arizona Strip FO only)

Impacts to vegetation resources would be the same as described under Alternatives A.

Impacts from Livestock Grazing

The types of impacts to vegetation resources would be the same as those described under Alternative A. In Parashant, impacts would occur over a larger area and over a longer period than for Alternatives B and C due to an increase in the size and/or season of use of areas open to livestock grazing. More acres would be under seasonal use restrictions than under any other alternative with the exception of Alternative C. In Vermilion, some 15,610 acres would not be available for livestock grazing. The duration of impacts in these areas would be shorter. For Arizona Strip FO, impacts would be similar to those described under Alternative D.

Impacts from Recreation

Impacts would be similar to those described under Alternative A.

Impacts from Lands and Realty

Impacts would be the same as those described under Alternative A. However, for the Arizona Strip FO, slightly more acres would be available for disposal under this alternative, and also more than in Alternative B.

FIRE AND FUELS MANAGEMENT

This section describes potential impacts of the alternatives on fire and fuels management. Alternatives can affect hazardous fuel loads and the BLM's ability to manage them; tools for implementing fuels treatments; the potential for human-caused ignitions; fire suppression activities; fire use; threats to people, property, and sensitive resources from wildland fire; Fire Regime/Condition Class (FRCC); and the risk of undesirable wildland fire.

Methods and Assumptions

The analysis of potential impacts to fire and fuels management is based on the expertise of BLM resource specialists at the Arizona Strip FO and the NPS staff at Parashant and Lake Mead NRA, information in the Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management (2004), and scientific literature.

Effects are quantified where possible. Best professional judgment was used when quantifiable data were unavailable. The intensities of impacts are also described, where possible, using the following guidance:

Negligible	The impact would not be detectable. Threats to people, property or sensitive resources from wildland fire would not change. Ability to implement appropriate management response and hazardous fuels treatments would not be affected. Changes to fuel loads, FRCC, and risk of undesirable wildland fire would affect minimal acres.
Minor	The impact would be detectable. Threats to people, property or sensitive resources from wildland fire would be minor. Minor changes in ability to implement appropriate management response and hazardous fuels treatments would occur. Changes to fuel loads, FRCC, and risk of undesirable wildland fire would have measurable or perceptible changes, but be localized in relatively small areas.
Moderate	The impact would be readily apparent. Threats to people, property or sensitive resources from wildland fire would be moderate. Moderate changes in ability to implement appropriate management response and hazardous fuels treatments would occur. Changes to fuel loads, FRCC, and risk of undesirable wildland fire would have measurable or perceptible changes to a moderately sized area.
Major	The impact would be severe. Threats to people, property or sensitive resources from wildland fire would be greatly affected. Ability to implement appropriate management response and hazardous fuels treatments would be greatly changed. Changes to fuel loads, FRCC, and risk of undesirable wildland fire would have measurable or perceptible changes to a large area.

The following assumptions regarding fire and fuels management are made:

- All fire and fuels management policies, guidelines, and procedures would be followed.
- Fire and fuels would be managed to meet the objectives described in the Fire Management Plan.
- All Conservation Measures pertaining to fire suppression operations would be followed unless firefighter or public safety, or the protection of property, improvements, or natural resources, renders them infeasible during a particular operation. All Conservation Measures pertaining to fuels treatments would be followed when implementing wildland fire use, prescribed fires, and other vegetation treatments.

Impacts to Fire and Fuels Management

Impacts to vegetation resources would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Wilderness Characteristics
- Vegetation and Fire and Fuels Management

- Fish and Wildlife
- Special Status Species
- Visual
- Cultural Resources
- Livestock Grazing
- Recreation

Alternative A: No Action

Impacts from Trails and Travel Management

Historically, most wildland fires in the planning area have been ignited by lightning. However, the potential for human-ignited wildland fires would increase with rising human use of the Planning Area. Areas accessible by motorized vehicles would likely be the most susceptible to human-ignited wildland fires, but it is impossible to quantify increases in ignitions and acres burned. Cross-country access for wildland fire suppression would be authorized under all alternatives. Maintaining or upgrading designated routes could make these areas more accessible to fire suppression vehicles and improve the effectiveness of fire suppression actions, but also lead to increased public use. Under Alternative A, public access would be limited to designated routes, motorized and mechanized cross-country vehicle travel on the Monuments would be prohibited, a minimum of new routes would be constructed, and designated and existing routes would not be upgraded or enhanced. Impacts could be negligible to moderate.

Impacts from Wilderness Characteristics

No areas would be allocated for wilderness characteristics.

Impacts from Vegetation and Fire and Fuels Management

Fuels and vegetation treatments would continue to be implemented with no maximum acreage limits, treatment priority criteria, or treatment preferences for ecological zones. Prescribed fire, fire use, and manual treatments following minimum tool requirements would not be authorized for all wilderness areas. Treatments would directly affect fuel loads and could indirectly affect fire suppression, as treated areas may burn less intensely than untreated areas in wildland fires. Fire use could increase the size of fires that would have otherwise been suppressed. Impacts would be moderate. The duration of impacts would vary by vegetation type depending on the rate of regeneration after treatments.

Impacts from Fish and Wildlife

Building new artificial water sources would provide water for fire suppression activities. Effects would be localized and depend on whether wildland fires occur in the vicinity of the new water developments. Impacts could range from negligible to minor. Pronghorn passable fences would

reduce fuel loads by minimizing tumbleweeds piled along fences. Impacts would be negligible to minor because this has not been a significant problem in the past. Restricting activities during desert bighorn sheep lambing (December 1-May 31) could impact the timing of fuels treatment projects or fire use. Impacts would be negligible because treatments could be rescheduled, and this is outside of the peak wildland fire season.

Impacts from Special Status Species

Measures to mitigate fire management actions in special status species habitats could increase suppression costs, limit suppression equipment choices and tactics, require additional effort from firefighters, and limit options for treating hazardous fuels in some areas. Reintroductions of special status species could increase the areas where these measures would be required. Impacts of the measures and reintroductions could range from negligible to minor, depending on the area and frequency and intensity of wildland fires. Implementing peregrine falcon restrictions from March – July could impact fire suppression activities and the implementation of fuels treatments. Impacts would be negligible because the decision would affect a small area. This alternative is the least restrictive for mechanical vegetation treatments. Limiting available tools could reduce the effectiveness and efficiency of fuels treatments, potentially resulting in impacts that are negligible to moderate depending on the type of fuels being treated, size of fuels treatment, and threat of wildland fire.

Impacts from Visual Resources

Because fuels treatments would need to be compatible with VRM classes, the types and scope of fuels treatments would be limited in VRM classes I and II. See Impacts from Visual Resources in the Impacts to Vegetation section. In Parashant, the least number of acres would be designated as VRM classes I and II in Alternative A. Impacts would be negligible to minor because fuels treatments could be implemented in VRM classes III and IV. In the Arizona Strip FO, Alternative A has the largest acreage of VRM classes I and II, but the smallest acreage for VRM classes III and IV when compared to the other alternatives. Impacts would be moderate. Fuels treatments are a low priority in Vermilion, so impacts would be negligible for all alternatives.

Impacts from Cultural Resources

Required compliance with NEPA and the National Historic Preservation Act (NHPA) and proactive cultural resource inventory and other work could limit fire and fuels management actions and increase costs for compliance and mitigation. Impacts could be minor to moderate, depending on ability to fund compliance and mitigation for fuels treatments.

Impacts from Livestock Grazing

Livestock grazing could reduce fine fuel loads and the size and intensity of wildland fires in some areas during high grass production years. See description of livestock grazing impacts under the Impacts to Vegetation section for additional effects to vegetation and fuels and impacts of managing areas as forage reserves. Activities associated with livestock grazing could increase wildland fire ignitions. Under Alternative A, seasons of use for some allotments would be greater than under other alternatives, and portions of some allotments would be closed to livestock grazing. Impacts could be negligible to moderate, depending on the recovery of these areas, rainfall, and other factors affecting fuel loads, and may vary from year to year. Impacts from the construction and maintenance of water developments would be similar to those from wildlife water developments.

Impacts from Recreation

Increased participation in recreation activities and larger areas impacted by recreation could increase the potential for human-ignited fires. Impacts could range from negligible to moderate. Improved signing and facility management, compliance patrols by law enforcement, and management of outfitters and guides could improve visitor compliance with fire restrictions and provide opportunities to promote a fire prevention message and provide information about fire ecology. Impacts could range from minor to moderate.

Alternative B

Impacts from Trails and Travel Management

General impacts from trails and travel management are described under Alternative A. Alternative B would be the most restrictive on motorized and mechanized access, limiting the potential for human-ignited wildland fires. Impacts could be negligible to moderate.

Impacts from Wilderness Characteristics

Minimum impact suppression tactics (MIST) would be used in areas allocated for wilderness characteristics, potentially increasing suppression costs and the amount of time to contain wildland fires. Impacts would be minor. In Parashant, the greatest number of acres would be allocated for wilderness characteristics in Alternative B. In the Arizona Strip FO, fewer acres would be allocated for wilderness characteristics under Alternative B than under Alternative C, but more acres would be allocated for wilderness characteristics under Alternative B than under Alternatives D and E. Under Alternative B, fuels management would rely on natural processes (fire use) rather than fuels and vegetation treatments. In Parashant and the Arizona Strip FO, impacts could be moderate. Because fuels treatments are a low priority in Vermilion, impacts would be negligible.

Impacts from Vegetation and Fire and Fuels Management

Fuels and vegetation treatments would be implemented with less aggressive acreage limits, treatment priority criteria, and treatment preferences than under Alternatives C, D, and E. Fewer treatment methods would be authorized than under Alternatives C and D. Prescribed fire, fire use, and manual treatments following minimum tool requirements would be authorized for all wilderness areas classified as Wildland Fire Use based on ecological zone. Treatments would directly affect fuel loads and could indirectly affect fire suppression, as treated areas may burn less intensely than untreated areas in wildland fires. Fire use would directly impact fuel loads and fire suppression during the incident. Fire use could increase the size of fires that would have otherwise been suppressed. Treatments and fire use could indirectly affect appropriate management response during future ignitions. Impacts would be moderate and both short and long term.

Impacts from Fish and Wildlife

Implementing and maintaining vegetation treatments benefiting wildlife would reduce fuel loads. If wildland fire occurs in maintained areas, fire intensities and negative impacts from fire could be lower than if areas were not maintained. Impacts could range from negligible to major depending on the size and location of treatments. Impacts from building new artificial water sources, requiring pronghorn passable fences, and restricting activities during desert bighorn sheep lambing would be the same as Alternative A.

Impacts from Special Status Species

Impacts of measures to mitigate fire management actions in special status species habitats, special status species reintroductions, and implementing peregrine falcon restrictions would be the same as under Alternative A. This alternative is the most restrictive for mechanical vegetation treatments, and impacts could be greater than under the other alternatives. Impacts could be negligible to moderate depending on the type of fuels being treated, size of fuels treatment, and threat of wildland fire. Modifying or adding ACECs for the protection of special status plants would alter where associated fire suppression and fire use restrictions are required. Not authorizing the use of tracked vehicles for fire suppression in listed plant habitats would impact the tools available for fighting fire in these areas. Modifying ACECs and not authorizing tracked vehicles could result in negligible to minor impacts because fire does not play a large role in most of these areas.

Impacts from Visual Resources

Because fuels treatments would need to be compatible with VRM classes, the types and scope of fuels treatments would be limited in VRM classes I and II. See impacts from visual resources to vegetation management. In Parashant, all but 12 acres would be VRM classes I and II. Impacts would be major because Alternative B would preclude some types of treatments in the

Monument. In the Arizona Strip FO, Alternative B designates fewer acres as VRM classes I and II than Alternative A, but more acres than Alternatives C, D, and E. Impacts would be moderate because treatments could be planned in the other VRM classes. Fuels treatments are a low priority in Vermilion, so impacts would be negligible for all alternatives. Mitigating impacts night sky could affect suppression activities, fire camps, and new fire stations or other facilities. Impacts would be negligible.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

Impacts would be similar to Alternative A, although a smaller area would be affected. See corresponding Impacts to Vegetation section for acreage comparisons. Impacts could be negligible to moderate, depending on the recovery of these areas, rainfall, and other factors affecting fuel loads, and may vary from year to year.

Impacts from Recreation

General impacts of recreation are described under Alternative A. In Parashant, constructing recreation infrastructure would provide new opportunities to educate the public about fire prevention and fire ecology. Fuels treatments in the Back Roads and Outback Management Units would be limited to natural processes (fire use). Impacts could be minor to moderate.

Alternative C

Impacts from Trails and Travel Management

General impacts are described under Alternative A. More than 474 fewer miles of routes would be open in the Monuments than under Alternative A, but nearly twice as many acres would be open to motorized and mechanized vehicles in the Arizona Strip FO. Impacts could be negligible to moderate.

Impacts from Wilderness Characteristics

General impacts would be similar to Alternative B. In Parashant, more acres would be allocated for wilderness characteristics under Alternative C than under Alternatives D and E. Under Alternative C, natural processes (fire use) would be emphasized, but other tools could be used for fuels projects. However, because more acres would be classified as VRM classes I and II, which places the greatest limitations on fuels projects, under Alternative C than under Alternatives D and E, impacts could be moderate. Fuels treatments are a low priority in Vermilion, so impacts would be negligible. The Arizona Strip FO would have the most acres

allocated for wilderness characteristics under Alternative C, as well as the most acres classified as VRM classes I and II other than under Alternative D. Impacts could be moderate.

Impacts from Vegetation and Fire and Fuels Management

Fuels and vegetation treatments would be implemented with acreage limits, treatment priority criteria, and treatment preferences for ecological zones that are more aggressive than Alternative B, but less aggressive than Alternative D. Alternative C is either the same or less aggressive than Alternative E, depending on the ecological zone and Planning Area. More acres and treatment methods would be authorized than under Alternative B, fewer acres and treatment methods would be authorized than under Alternative D, and the same or fewer acres and treatment methods would be authorized than under Alternative E, depending on the ecological zone. Prescribed fire, fire use, and manual treatments following minimum tool requirements would be authorized for all wilderness areas classified as Wildland Fire Use based on ecological zone. Treatments would directly affect fuel loads and could indirectly affect fire suppression, as treated areas may burn less intensely than untreated areas in wildland fires. Fire use would directly impact fuel loads and fire suppression during the incident. Fire use could increase the size of fires that would have otherwise been suppressed. It could indirectly affect appropriate management response during future ignitions. Impacts would be moderate and both short and long term.

Impacts from Fish and Wildlife

Impacts would be the same as described under Alternative B.

Impacts from Special Status Species

Mechanical vegetation treatments would be less restrictive than under alternatives B, D, and E, but more restrictive than Alternative A. Impacts from other decisions would be the same as Alternative B.

Impacts from Visual Resources

Because fuels treatments would need to be compatible with VRM classes, the types and scope of fuels treatments would be limited in VRM classes I and II. See impacts from visual resources to vegetation management. In Parashant, more acres are designated as VRM classes I and II in Alternatives C and E than in alternatives A and D. Impacts would be moderate because treatments could be moved to VRM class III. In the Arizona Strip FO, fewer acres are designated as VRM classes I and II in Alternative C than in Alternatives A, B, and E. Impacts would be minor. Fuels treatments are a low priority in Vermilion, so impacts would be negligible for all alternatives. Mitigating impacts to night sky would be the same as Alternative B.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

Impacts would be similar to Alternative A. See corresponding vegetation management section for acreage comparisons. Impacts could be negligible to moderate, depending on the recovery of these areas, rainfall, and other factors affecting fuel loads, and may vary from year to year.

Impacts from Recreation

General impacts of recreation are described under Alternative A. In Parashant, developing interpretive sites could provide new opportunities to educate the public about fire prevention and fire ecology. Fuels treatments in the Back Roads and Outback Management Units would not be limited to natural processes (fire use). Impacts could be minor to moderate.

Alternative D

Impacts from Trails and Travel Management

General impacts are described under Alternative A. More miles of routes on the Monuments would be open than in Alternative C. In the Arizona Strip FO, new motorized routes could be built to enhance recreation opportunities, and nearly nine times as many acres would be open to motorized and mechanized vehicle use than in Alternative A. Impacts could be negligible to moderate.

Impacts from Wilderness Characteristics

General impacts would be similar to Alternative B. Under Alternative D, fuels treatments would be accomplished by the most efficient means available. In Parashant, the fewest acres would be allocated for wilderness characteristics and classified as VRM classes I and II in Alternative D. Impacts would be minor. No acres would be allocated for wilderness characteristics in Vermilion. In the Arizona Strip FO, the fewest acres would be allocated for wilderness characteristics and classified as VRM classes I and II in Alternatives D and E. Impacts would be minor.

Impacts from Vegetation and Fire and Fuels Management

Fuels and vegetation treatments would be implemented with maximum acreage limits, treatment priority criteria, and treatment preferences for ecological zones. More acres and treatment methods would be authorized than under Alternatives B and C, and the same or more acres and

treatment preferences would be authorized than under Alternative E, depending on the ecological zone. Prescribed fire, fire use, and manual treatments following minimum tool requirements would be authorized for all wilderness areas classified as Wildland Fire Use based on ecological zone. In Parashant, additional steps would be taken to protect old-growth ponderosa pines, rehabilitate treatment areas, and reseed, and helicopters would be authorized for some activities in Alternatives D and E. Treatments would directly affect fuel loads and could indirectly affect fire suppression, as treated areas may burn less intensely than untreated areas in wildland fires. Fire use would directly impact fuel loads and fire suppression during the incident. Fire use could increase the size of fires that would have otherwise been suppressed. It could indirectly affect appropriate management response during future ignitions. Impacts would be moderate and both short and long term.

Impacts from Fish and Wildlife

Impacts would be the same as described under Alternative B.

Impacts from Special Status Species

Mechanical vegetation treatments would be less restrictive than under alternatives B and E, but more restrictive than Alternative A. Impacts from other decisions would be the same as described under Alternative B.

Impacts from Visual Resources

Because fuels treatments would need to be compatible with VRM classes, the types and scope of fuels treatments would be limited in VRM classes I and II. See impacts from visual resources to vegetation management. In Parashant, more acres would be designated as VRM classes I and II than in Alternative A, but fewer acres would be designated as VRM classes I and II than in Alternatives B, C, and E. Impacts would be moderate. In the Arizona Strip FO, the fewest number of acres would be designated as VRM classes I and II in Alternative D. Impacts would be minor. Fuels treatments are a low priority in Vermilion, so impacts would be negligible for all alternatives. Mitigating impacts to night sky would be the same as described Alternative B.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

Impacts would be similar to those described under Alternative A. See corresponding Impacts to Vegetation section for acreage comparisons. Impacts could be negligible to moderate, depending on the recovery of these areas, rainfall, and other factors affecting fuel loads, and may vary from year to year.

Impacts from Recreation

Impacts would be similar to those described under Alternative A.

Alternative E: PreferredImpacts from Trails and Travel Management

General impacts are described under Alternative A. On the Monuments, road closures would be between Alternatives C and D. In the Arizona Strip FO, acres of open areas would be comparable to Alternative D. Impacts could be negligible to moderate.

Impacts from Wilderness Characteristics

General impacts would be similar to those described under Alternative B. Tools available for fuels projects would be the same as under Alternative C. In Parashant, more acres would be allocated for wilderness characteristics and classified as VRM classes I and II in Alternative E than in Alternative D. Impacts would be minor to moderate. Fuels treatments are a low priority in Vermilion, so impacts would be negligible. In the Arizona Strip FO, impacts would be the same as under Alternative D.

Impacts from Vegetation and Fire and Fuels Management

Fuels and vegetation treatments would be implemented with maximum acreage limits, treatment priority criteria, and treatment preferences for ecological zones. Maximum acres and treatment methods would be the same as under Alternative C or D, depending on the ecological zone. Prescribed fire, fire use, and manual treatments following minimum tool requirements would be authorized for all wilderness areas classified as Wildland Fire Use based on ecological zone. The impacts of the Mt. Trumbull restoration project would be the same as under Alternative D. Treatments would directly affect fuel loads and could indirectly affect fire suppression, as treated areas may burn less intensely than untreated areas in wildland fires. Fire use would directly impact fuel loads and fire suppression during the incident. Fire use could increase the size of fires that would otherwise be suppressed. It could indirectly affect appropriate management response during future ignitions. Impacts would be moderate.

Impacts from Fish and Wildlife

Impacts would be the same as described under Alternative B.

Impacts from Special Status Species

Mechanical vegetation treatments would be less restrictive than Alternatives B and D, and more restrictive than Alternatives A and C. Impacts from other decisions would be the same as described under Alternative B.

Impacts from Visual Resources

Because fuels treatments would need to be compatible with VRM classes, the types and scope of fuels treatments would be limited in VRM classes I and II. See impacts from visual resources to vegetation management. Impacts in Parashant and Vermilion would be the same as Alternative C. In the Arizona Strip FO, fewer acres would be designated as VRM classes I and II than in Alternatives A and B, but more acres would be designated as VRM classes I and II than in Alternatives C and D. Impacts would be moderate. Mitigating impacts to night sky would be the same as Alternative B.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative A.

Impacts from Livestock Grazing

Impacts would be similar to those described under Alternative A. See corresponding Impacts to Vegetation section for acreage comparisons. Impacts could be negligible to moderate, depending on the recovery of these areas, rainfall, and other factors affecting fuel loads, and may vary from year to year.

Impacts from Recreation

Impacts would be similar to those described under Alternative A.

Cumulative Impacts

The geographic area of analysis for cumulative impacts to wildland fire is the Planning Area and adjacent lands. Actions affecting fire management primarily include factors that affect fuel loads (e.g., spread of invasive species, vegetation treatments on lands adjacent to the Planning Area, surface disturbing activities, drought conditions, climate change) and factors that provide potential ignition sources (e.g., recreation, OVH use). The continued spread of exotic annual grasses would increase the size and number of fires. Invading tamarisk would continue to increase flammable fuel loads in riparian areas, increasing the risk of stand-replacing fire. Surface disturbing activities would alter plant species composition and density, and promote the spread of invasive plants. Vegetation treatments adjacent to the Planning Area would reduce the chance of wildland fire spreading onto the Planning Area. Drought would impact fuel loads, fire intensities, and the size of wildland fires. Population growth and resulting increases in vehicle and OVH use may increase ignitions.

FISH AND WILDLIFE

The primary impact issues to fish and wildlife resources from other management programs in the Planning Area include loss or alteration of native habitats, increased invasion of noxious weeds and other exotic weed species, decreased water availability, increased habitat fragmentation, changes in habitat and species composition, disruption of species behavior leading reduced reproductive fitness and/or increased susceptibility to predation, and direct mortality of wildlife. Surface disturbing actions that alter vegetation characteristics (e.g. structure, composition, and/or production) have the potential to affect habitat suitability for fish and wildlife, particularly where the disturbance removes or reduces cover and/or food resources. Even minor changes to vegetation communities have the potential to affect resident fish and wildlife populations.

Direct impacts to fish and wildlife resources from management activities may result in mortality or displacement of individuals, disturbance in reduced air or water quality, and alteration of immediate environments through loss of, or changes to, key habitat components. Key habitat components include food availability or quality, cover from predators, insulation from extreme temperatures, nesting/roosting/denning habitat, water availability and quality, and travel corridors. Direct impacts may affect wildlife populations or habitats for the duration of the action, for a few days thereafter, for several growing seasons, or may continue indefinitely where the action results in permanent habitat loss.

Indirect impacts to fish and wildlife resources from management activities typically result from influences of post-disturbance succession, recovery, or rehabilitation of the habitat. These impacts may be long-term, depending on the severity of the habitat alteration, and may change species assemblages (relative abundances or species composition), species behaviors, or overall population trends, benefiting some species while negatively affecting others.

The direct and indirect effects of management actions on fish and wildlife resources may vary widely, depending on a variety of factors such as the dynamics of the habitat (e.g. community type, size, shape, complexity, seral state, condition); season, intensity, duration, frequency, and extent of the disturbance; rate and composition of vegetation recovery; change in vegetation structure; type of soils; topography and microsites; animal species present; and the mobility of fish or wildlife species (i.e., ability to leave a site or recolonize a site after a disturbance).

Methods and Assumptions

The analysis of potential impacts to fish and wildlife resources is based on the expertise of BLM resource specialists at the Arizona Strip District and the NPS staff at Lake Mead NRA. Combined, these staffs possess an extensive knowledge of fish and wildlife resources within the Planning Area. The impact analysis is also based on review of existing literature and information provided by non-planning team experts in the BLM, NPS, and other agencies.

Quantifying these effects is difficult due to the lack of monitoring data for most species. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible:** No changes to fish and wildlife resources would occur, or effects on individuals, populations, or habitat would be at or below the level of detection. If detected, the effects would be considered slight.
- Minor:** Changes to fish and wildlife resources would be measurable, although the changes would be small, short-term (less than seven consecutive days), and local. Mitigation measures would not be necessary.
- Moderate:** Changes to fish and wildlife resources would be measurable and would have appreciable consequences, although the effect would be relatively local. Mitigating measures would be necessary, but would most likely be successful.
- Major:** Changes to fish and wildlife resources would be measurable, have substantial consequences, and be noticed regionally. Mitigating measures would be necessary, and their success would be uncertain.

Because some species of fish and wildlife are also considered special status species, only impacts to non-special status fish and wildlife are discussed in this section. Impacts to federally listed, proposed, candidate, State, or BLM sensitive species are addressed in the Impacts to Special Status Species section.

The following assumptions regarding fish and wildlife resources are made:

- Wildlife habitat would be managed for those species identified as priority wildlife and migratory bird species.
- All surface disturbing activities include mitigation to reduce impacts to wildlife resources. Analysis of impacts includes any and all mitigation.
- Wildlife management through habitat restoration and vegetative treatment actions would be based on managing for various states and stages of vegetation based on site potential as described for ecological zone in the Vegetation and Fire and Fuels Management section of Chapter 2.
- Parashant has no streams and no fishery resources.

Impacts to Fish and Wildlife

Impacts to fish and wildlife resources in would result from actions proposed under the following resource management programs:

- Transportation and Access
- Wilderness Characteristics (Parashant only)
- Vegetation and Fire and Fuels Management
- Air, Water, and Soil
- Fish and Wildlife
- Special Status Species
- Mineral Resources (Arizona Strip FO only)
- Livestock Grazing
- Recreation
- Lands and Realty

Alternative A: No Action

Impacts from Trails and Travel Management

Due to the number of miles of road open for public use under Alternative A, the magnitude of impacts discussed below would be greater than for any other alternative.

Minor, short-term indirect impacts could result from disturbance, noise, and dust from traffic on the designated transportation system. Forage vigor and overall habitat suitability could be reduced from dust settling on vegetation adjacent to roads, reducing the overall habitat suitability for wildlife.

Wildlife may be injured or killed by collisions with vehicles traveling upon the existing transportation system. Impacts from collisions typically affect individuals, though populations may also be adversely affected if the species is rare or collisions are frequent. Birds, reptiles, and small mammals are among the species most commonly hit by vehicles. Generally, collisions with wildlife are infrequent in the Planning Area, with the exception of rabbit kills during periods when they are locally abundant. Because of the reduced traffic volume, impacts from collisions on roads open only for administrative purposes are considered rare.

The construction of new, temporary roads to facilitate project implementation would result in moderate short-term direct impacts to fish and wildlife resources, as some species would be injured, killed, or displaced during construction and rehabilitation work. Wildlife habitat areas would be temporarily fragmented while the road was in use, an effect that varies in magnitude and intensity by wildlife species. The rehabilitation of temporary roads would have moderate short- and long-term direct and indirect impacts. Short-term direct impacts would include construction noise and dust and disturbance from human activity. Other direct impacts include displacement, loss of habitat, injury, or death of individuals during the rehabilitation phase. Indirect effects to wildlife habitat include reduced erosion and compaction, and increased infiltration, resulting in a reduction of habitat suitability for some species. Following completion of rehabilitation actions, wildlife would benefit from the reestablishment of vegetation, removal

of the source of disturbance, and restoration of the habitat. Indirect habitat effects include increased vegetation productivity and improved wildlife habitat connectivity.

Impacts from Wilderness Characteristics

No areas are identified to be allocated for wilderness characteristics under the No Action Alternative. Therefore, no impacts to fish and wildlife resources would result.

Impacts from Vegetation and Fire and Fuels Management

Restoration and Vegetation Treatments: During restoration treatments, effects to fish and wildlife resources could include disturbance of breeding, feeding, and sheltering activities; temporary or permanent loss of habitat or components; increased habitat fragmentation; increased susceptibility to predation; forced emigration; and/or direct injury or mortality. Reclamation of sites previously disturbed by facility development would have minor short and long-term direct and indirect impacts. Short-term minor direct impacts would include reestablishment of native vegetation for forage and cover. Long-term minor direct impacts would include reestablishment of vegetation structure. Short-term minor indirect impacts would include reduced erosion and compaction, and increased infiltration. Long term minor indirect impacts could include increased vegetation productivity, resulting in increased forage and cover for wildlife. Refer to Impacts to Vegetation from Vegetation and Fire and Fuels Management for a discussion of impacts from various treatment methods used.

Reclamation actions such as re-contouring, ripping compacted areas, replacing topsoil, seeding, planting, etc. could injure or kill individual animals. The magnitude of anticipated impacts would vary by the treatment method used, but would generally vary from minor to moderate, particularly for animals with low mobility.

Following vegetation treatment, increased invasion of noxious weeds and other exotic weed species, decreased water availability, and long term changes in habitat and species composition could occur. The duration of these effects would vary by treatment method, habitat and community type, availability of appropriate seed, and amount and timing of precipitation. Temporary or permanent reductions in water quantity, quality, or access could lead to the same anticipated effects.

Mechanical and chemical treatment methods could result in localized, short-term impacts to air quality, including fugitive dust, emission/exhaust from equipment, and chemical fumes. Temporary reduction in air quality could lead to reduced fitness, increased susceptibility to predation, or mortality among wildlife species.

In Vermilion, vegetation treatments in riparian areas that result in successful reduction of tamarisk and other invasive exotics would ultimately benefit most riparian dependent species, though treatments would initially have impacts to those species.

Collection and Use of Native Seed/Use of Non-native Plants: Use of nonnative plant species for re-seeding could impact wildlife habitat by introducing species that could out compete preferred wildlife forage species or increase the frequency or intensity of fire. Use of nonnative plant species can also help stabilize soils following disturbance when native species are ineffective, cannot be established, or are not available. Collection of native seed would not be authorized under this alternative.

Vegetation Products Use/Sale: Use and/or sale of vegetation products in Parashant and Arizona Strip FO would have localized, minor to moderate to impacts on wildlife, particularly harvest of fuelwood associated with restoration projects, post cutting, collection of dead and downed wood for campfires, Christmas tree harvest, and collection of pinyon nuts. Impacts would generally be due to disturbance of breeding, feeding, or sheltering activities. Impacts resulting from fuelwood harvest associated with restoration projects could lead to long term or permanent loss of habitat, nest abandonment, emigration, and mortality of individuals, depending upon the species. Salvage of vegetation that would be destroyed through surface disturbing activities would not be authorized under this alternative.

Use and/or sale of vegetation products would not be authorized in Vermilion. Impacts from free and non-commercial use of these products would be similar in scope and extent to those described above.

Noxious Weed Management. Management of noxious weeds may cause temporary minor to moderate impacts to game and nongame species as a result of herbicide use. Assuming proper application of approved herbicides, impacts to wildlife species would not be expected to cause population level effects. Treatments designed to decrease or eliminate noxious weeds would benefit wildlife habitats by reducing or eliminating the chances for dominance of plant species with limited forage or cover values.

Fire Suppression, Use, and Management. The primary effects of fire to fish and wildlife resources would be the periodic loss or alteration of habitats from large, catastrophic fires or from aggressive fire suppression techniques that alter the natural density, structure, and composition of fire-adapted or fire-threatened habitats. Wildfires impact fish and wildlife resources by altering or reducing available habitat, reducing habitat suitability, changing the structure or composition of the habitat, and direct mortality of individuals. Direct effects on fish and wildlife resources vary by species.

Depending on species mobility, wildlife would experience impacts from mortality or displacement, disturbance resulting from fire suppression activities, and reduction of air quality from smoke and ash. While small animals (mammals, reptiles and amphibians) are most at risk for mortality because of their limited mobility, occasionally large mammals are killed by severe fast-moving wildfires, typically from smoke inhalation (Smith 2000).

Wildfires may also cause large-scale or intense alterations of habitat components for many fish and wildlife species, which would favor some species and displace others. Immediate post-fire conditions raise light penetration and temperatures on and immediately above and below soil surfaces and can reduce soil moisture, affecting ground-dwelling species (Lyon *et al.* 1978). Burning of cover and destruction of trees, shrubs, and forage modify habitat structure. The loss of small ground cover and charring of larger branches and logs would affect small animals and birds that use these components for nesting, thermal or escape cover, or foraging.

Alterations in terrestrial or riparian habitats would also affect water quality and habitat components for fish and other aquatic species. Wildfires may leave the surrounding soil and accumulated ash vulnerable to erosion and remove shading streamside vegetation, increasing sedimentation and water temperature.

Fish species occupying waterways could be subjected to the direct effects of increased sedimentation and water temperatures from removal of upland vegetation. The duration, intensity, and scope of these direct effects to wildlife and fish depend on the species and the characteristics of the fire.

Wildfires may frequently create more homogeneous habitats within and among vegetation communities, thereby reducing or changing the assemblage of species occupying these altered habitats. High-intensity fires create large numbers of snags that are normally of high value to many wildlife species (Smith 2000).

In lower elevation vegetation communities, such as in the Mojave Desert Ecological Zone, increases in invasive grass and shrub species have altered these habitats to a point where fires now carry in habitats that are intolerant of fire or fire suppression activities. Wildfire can cause rapid and profound changes in desert scrub habitats, both in the short-term and long-term, because many desert plants are not well adapted to large disturbances by fire (Esque *et al.* 2003). Fires now burn hotter and farther, reducing the natural mosaic pattern typical to desert scrub communities (Esque *et al.* 2003). Wildfires in these fire-intolerant habitats would lead to mortality, displacement, loss of food and shelter, and changes in animal communities for fish and wildlife species not historically impacted by fires or fire suppression activities. While extirpation (100% mortality) of entire populations in burned areas is unlikely, direct mortality of wildlife (particularly small animals) in desert fires is fairly common, although highly variable (Esque *et al.* 2003).

Fire suppression activities also have direct and indirect effects on fish and wildlife species and their habitats. Water taken from small ponds for helicopter bucket drops may affect aquatic organisms by depleting their habitat, removing individuals, or spreading disease or non-native, predatory species (such as bullfrogs) among different water sources. Conversely, it is sometimes possible to use water drops as an alternative to constructing hand line to control fire movement. This method would result in less impact to soil, forest litter, and vegetation than hand line construction and, therefore, would have less impact on wildlife, both in intensity and duration.

Some terrestrial wildlife could be struck by water or retardant drops, resulting in injury or chemical contamination or be disturbed by low-flying aircraft. Construction of helispots often results in the felling of trees and snags, which are important habitat components. In addition, helicopter traffic would likely disturb wildlife, such as nesting raptors. Hand line construction would remove and disturb soil and forest litter, possibly affecting animals such as small mammals, amphibians, invertebrates, and ground-nesting birds.

The presence of hand line crews in remote locations could cause direct disturbance of some wildlife species and introduce unnatural food sources. Removal of forest litter and live vegetation can also lead to soil erosion and increased siltation in adjacent lakes and streams. Any fire suppression action that requires the felling of snags to protect human safety and the integrity of the fire line would potentially affect wildlife by reducing the availability of snags to species such as woodpeckers, squirrels, or some bat species. The number of snags lost would vary, depending upon factors such as the type and age of tree stand, its history of fire and/or disease or insect infestation, and the intensity of the fire. Direct and indirect impacts from most suppression techniques would be short-term, temporary, and localized, particularly if sensitive habitats are mitigated or avoided. Suppression actions in the arid desert scrub communities may be longer term or more intense, since these vegetation communities have much longer recovery periods, thereby having a longer term effect on the wildlife species that inhabit them.

Identification of fire use areas would allow for the use of fire as a method for reducing fuel loads and increasing habitat productivity for resource enhancement in specific areas. Fire use would have similar impacts to wildlife as those described above for wildfire, fire suppression, and vegetation treatments.

Impacts from Soil, Water and Air Resources

Restoration and other types of vegetation treatment actions would have similar effects on fish and wildlife resources to those described above in the Impacts from Vegetation and Fire and Fuels Management section (Restoration and Vegetation Treatments).

Construction of dams, dikes, and other water retention structures would have short-term impacts to wildlife similar to those described for vegetation treatments. The area of disturbance would vary by the action proposed, but generally would average less than five acres per structure.

Acquisition of water rights by the BLM would allow for uniform management of water resources and provide more water for wildlife. Mitigation of adverse effects of fugitive dust resulting from authorized actions would reduce the severity of impacts to fish and wildlife resources.

Impacts from Fish and Wildlife

Fish and wildlife resources would benefit from development of HMPs by providing site specific objectives and actions to enhance habitat conditions. Restrictions on uses within sensitive or priority wildlife habitats would mitigate or eliminate impacts to wildlife resources.

Initial and supplemental transplants of big game wildlife species may result in minor to moderate long term impacts to other wildlife species in the area. Competition with local wildlife species for food, water, and cover components of habitat could lead to interactions that could be adverse to one or both species. Some individuals could be displaced from preferred habitat areas. Supplementing the big game populations in the Planning Area would increase population levels for that species and provide additional food resources for predators.

Construction of new water developments would permanently displace local wildlife species, depending upon the level of surface disturbance required. Wildlife within the local area could be disturbed from breeding, feeding, and sheltering activities during construction. Water developments may increase opportunities for predation on animals as they drink. New water developments benefit most species in the area, including nongame, by allowing animals to colonize new habitat areas that were previously too arid to use. As many as 20 new wildlife water developments would be built throughout the life of this Plan. The average size of the disturbance area is less than two acres each. As much as 40 acres of wildlife habitat could be permanently altered by construction of new artificial water sources.

Maintenance of water developments would result in minor disturbance impacts to species that rely on the water. Failure to maintain access to and reliability of water developments could lead to mortality of individuals, increased predation, and loss of the local population. Approximately 10 wildlife water developments each year are inspected and maintained in the Planning Area.

Animal damage control actions result in the mortality of individual predators involved in depredation of livestock. Under this Alternative, predator control would be limited to offending animals only. Where aircraft is used to complete the animal damage control actions, minor disturbance impacts would result to local species. Where the potential exists for collisions with aircraft, some individual animals could be injured or killed. Non-target species may be disturbed or have breeding, feeding, or sheltering activities disrupted. Potential prey would benefit from removal of the offending animal.

Wildlife inventories can lead to disturbance impacts that range from minor to major in magnitude. Where aircraft are used, the potential exists for target and non-target individuals to be injured or killed, either as a direct result of collision with the aircraft, or from disturbance that causes the animal to break cover and run, increasing susceptibility to predation.

Pronghorn antelope would benefit from modifications to fences within their habitat to ensure they would be passable to wildlife.

Desert bighorn sheep would benefit from restrictions on grazing sheep or goats within nine miles of their habitat. Elimination or control of these animals would minimize or eliminate risk of spread of disease between the species that could be detrimental to bighorn.

In Parashant, minor, short-term impacts would result to these species from disturbance of breeding, feeding, and sheltering activities from continued management of Mt. Trumbull as a Watchable Wildlife area for Kaibab squirrels, Merriam's turkey, nongame birds, and mule deer.

Impacts from Special Status Species

Reintroductions of special status species may result in minor to moderate long-term impacts to other wildlife species in the area. Competition with local wildlife species for food, water, and cover components of habitat could lead to interactions that could be adverse to one or both species. Some individuals could be displaced from preferred habitat areas. Introducing species long absent from an area or non-endemic species could increase the prey base for predator species.

Fish and wildlife resources would benefit from implementation of use restrictions for special status species by reducing or eliminating disturbances that would otherwise have affected fish and wildlife resources. Implementation of management plans developed for special status species may benefit or be a disadvantage to fish and wildlife, depending upon the nature and timing of the actions and the degree of habitat use overlap between affected wildlife and the special status animals addressed. Inventories of special status species could lead to disturbance effects on a variety of wildlife species.

Restrictions on vegetation treatments in special status species habitats (e.g., desert tortoise or special status plants) would reduce or eliminate potential adverse effects from the treatment to fish and wildlife species, but would also prevent realization of benefits to the species from the action.

Closing roads in listed species habitat could affect wildlife resources depending upon the length and width of that portion of the road to be rehabilitated and the method used. Surface disturbing methods such as ripping and re-contouring could injure or kill individual animals, particularly small species with low mobility. Fencing could impede movement by wildlife species through the habitat and could lead to injury or mortality where animals become entangled in barbed wire. Closing the road or limiting access would benefit wildlife by minimizing opportunities for collisions, disturbance to breeding, feeding, or sheltering activities, and reducing avenues for introduction of invasive exotic species.

Desert Tortoise. In Parashant and the Arizona Strip FO, signing would increase awareness of desert tortoise throughout their habitat, potentially leading to increased visitation for wildlife viewing opportunities. Long-term seasonal impacts could result to other species from disturbance to breeding, feeding, and sheltering activities related to increased visitation. Impacts

could also occur from collection of individual animals, such as snakes and lizards, or from harassment by people or pets. Continuation of management of the Pakoon ACEC would afford some protection to other wildlife species. Fire suppression measures for desert tortoise, such as the presence of a resource advisor, would also benefit other species within the same habitats. Backfiring operations could lead to major impacts in the form of injury or death to low mobility species. Burro management in desert tortoise habitat would also benefit other wildlife species dependent upon scarce resources used by burros. Burro removal actions would have similar effects on other wildlife as those described for animal damage control under the Impacts from Fish and Wildlife portion of this alternative.

In Arizona Strip FO, designation of the Beaver Dam Slope, Virgin Slope, and Virgin River Corridor ACECs provides enhanced management capabilities for desert tortoise minimizing adverse effects from other resource management programs. Impacts from implementation of restrictions on authorized uses within listed species habitats are described under the resource program where the restrictions apply. These actions should enhance protection of habitat for other species of fish and wildlife in this area.

Impacts from Minerals (Arizona Strip FO only)

For the Arizona Strip FO, impacts would be similar in scope and extent to those described in the Impacts to Special Status Species from Minerals section.

Impacts from Livestock Grazing

Impacts associated with livestock grazing actions are similar to those described in the Impacts to Special Status Species from Livestock Grazing section. More acres would be available for livestock grazing under this alternative than under any of the others. The magnitude of the effects of livestock grazing is generally less on wildlife species not considered special status, but varies by species. Herbivorous species that compete for forage with livestock may experience greater effects. Livestock may also injure or kill small animals by trampling on colliding with individuals or nests.

Impacts from Recreation

Fish and wildlife resources could be disturbed from breeding, feeding, or sheltering activities as a result of any type of recreational activity that increases noise and dust. Wildlife resources could be impacted from disturbance associated with commercial recreation or competitive events depending upon the nature, location, and duration of the action. Some wildlife may be injured or killed as a result of such activities. Vehicular events have the greatest potential to affect wildlife, particularly those held during the time of year when species are rearing young. Animals could be injured or killed by collisions with vehicles on designated routes. Disturbance could lead to emigration and/or an increased risk of predation. While the No Action Alternative includes

provisions to alter recreational activities that affect sensitive areas or species, such provisions would not be enforced until after monitoring had detected the impacts.

Foot traffic through sensitive areas could disturb, injure, or kill wildlife or prevent successful feeding or breeding activities. Recreational shooting activities increase noise and trash in a localized area and may lead to injury or death of animals. Camping may cause minor to moderate impacts to wildlife resources by disturbing animals, altering or removing habitat, increasing trash and debris in the area, and increasing the risk of wildfire. Animals may ingest foreign food substances that may cause illness or death. Camping activities where pets are allowed to roam freely may also cause impacts to wildlife. Use restrictions on these types of activities should reduce or eliminate adverse effects to wildlife.

Impacts from Lands and Realty

Impacts from issuance of ROWs would vary upon the nature and purpose of the ROWs. Impacts would be minor in the Monuments as any new ROWs or associated actions that had more than a negligible impact on Monument objects or values would not be authorized. For the Arizona Strip FO, impacts would be similar in scope and extent to those described in the section Impacts to Special Status Species from Lands and Realty Management.

Alternative B

Impacts from Trails and Travel Management

The types of impacts would be similar to those described under Alternative A. However, due to the increase in number of miles of roads closed or open for administrative use only, impacts would occur over a smaller area than under any other alternative.

Impacts from Wilderness Characteristics

In areas with wilderness characteristics proposed for allocation human imprints are “substantially noticeable,” such as wildlife water developments, could be identified for restoration. Removal of existing artificial water sources would have long term adverse effects on existing wildlife populations dependent upon those waters. Mule deer, bighorn sheep, and a variety of nongame species would be affected. Populations of species living within daily commuting distance from such waters would likely experience mortality among individuals, especially where the species was one of low mobility. Since wildlife water developments are a primary emphasis of wildlife management actions, restoration of these areas would slow or prevent achievement of wildlife management objectives. Minimum impact fire suppression tactics could lead to adverse impacts to wildlife resources by increasing direct mortality of wildlife and the amount of habitat lost due to fire. Because most acres would be allocated to maintain wilderness characteristics in the Monuments under Alternative B, the above impacts would be most widespread among the

alternatives. In the Arizona Strip FO, impacts would be more widespread than Alternatives D and E, but not Alternative C.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be similar to those described under Alternative A and in the Impacts to Special Status Species from Vegetation and Fire and Fuels Management section. In addition, DFCs and DPC objectives would be used in determining whether vegetation treatments or restoration actions would be authorized. DFCs benefit wildlife and their habitats by emphasizing consideration of these resources in the planning phase of these types of actions. Protection of sensitive wildlife species and habitat areas would be a priority for management. Seasonal restrictions on such actions could be used to mitigate impacts to wildlife.

Collection of Native Seed and Salvage of Vegetation Resources. In Parashant and the Arizona Strip FO, collection of native seed could result in localized, minor impacts to wildlife from disturbance, loss of food or cover resources, and short-term disruption of breeding, feeding, or sheltering activities. The extent of these impacts would vary by species. Salvage of vegetation would have similar impacts on wildlife as the surface disturbing action that lead to the salvage.

Riparian Ecological Zone. Managing the Riparian ecological zone for minimum disturbance to plant communities would benefit wildlife by minimizing disruption of breeding, feeding, and sheltering activities. No vegetation treatments would occur, though fire use could still be authorized. Impacts to wildlife could result from development of extensive tamarisk-dominated sites. Such sites are characterized by an increase in humidity, salinity, surface temperature, and fire frequency, as well as a decrease in available water.

Pakoon Springs Restoration. Restoration of Pakoon Springs could affect wildlife in a variety of ways depending upon the methods used. Impacts would be similar in scope and magnitude as those described for treatment methods under Alternative A.

Cane Springs Restoration. Wildlife resources would benefit from closing this area to grazing by mitigating or eliminating impacts similar to those described for Alternative A under Grazing Management.

In Vermilion, managing the Riparian ecological zone for minimum disturbance to plant communities would benefit wildlife by minimizing disruption of breeding, feeding, and sheltering activities. No vegetation treatments would occur, though fire use could still be authorized. Impacts to wildlife could result from development of extensive tamarisk-dominated sites. Such sites are characterized by an increase in humidity, salinity, surface temperature, and fire frequency, as well as a decrease in available water.

In the Arizona Strip FO, no treatments would be authorized or planned under Alternative B. Impacts to wildlife could occur from wildfire and reduction in water resulting from failure to treat invasive exotics.

Great Basin Ecological Zone. In Parashant, restoration treatments within this ecological zone would enhance localized habitat conditions through the treatment of pinyon-juniper woodlands within sagebrush habitats. Reduced canopy density and increased vegetative diversity in pinyon-juniper woodlands would benefit many wildlife species by increasing available forage and cover. Treatments in sagebrush communities would benefit nongame wildlife species, particularly migratory birds, by reducing sagebrush densities, providing habitat openings, and increasing forage availability.

In Vermilion, no vegetation treatments would be planned or authorized in sagebrush communities. Fire use would be an option. Impacts from vegetation treatments in pinyon-juniper communities could occur over the smallest area under this alternative than with any other alternative.

In the Arizona Strip FO, restoration treatments within this ecological zone would be less under this alternative than for any others due to the small area available for treatment.

Mojave Desert Ecological Zone. In Parashant, treatments could lead to an increase of exotic annual grasses, reducing cover and forage, raising surface temperatures, and reducing overall habitat quality for wildlife.

In the Arizona Strip FO, no treatments would be authorized or planned under this Alternative, so no impacts to wildlife are anticipated.

Mojave - Great Basin Transition Ecological Zone. In Parashant, impacts to wildlife from treatments would vary considerably by type of treatment and would be similar to those described for each method under Alternative A.

In the Arizona Strip FO, no treatments would be authorized or planned under this Alternative, so no impacts to wildlife are anticipated.

Ponderosa Pine Ecological Zone. In Parashant, restoration treatments which lead to improved habitat conditions within ponderosa pine stands would result in higher quality forage, cover, and structure for game and nongame wildlife.

Mt. Trumbull Wilderness. Minimum tool use in suppressing wildfires could increase the intensity and/or number of acres burned during restoration treatments. This could increase wildlife mortality. An increase in intensity could also kill more non-target (pre-settlement age) ponderosa pine trees, increasing the number of snags available as wildlife habitat. Impacts would occur on fewer acres under this alternative than for any other.

In the Arizona Strip FO, no treatments would be authorized or planned under this Alternative, so no impacts to wildlife are anticipated.

Interior Chaparral Ecological Zone. Black-chinned sparrow and mule deer would benefit from being identified as priority species in this ecological zone due to the increased consideration these species would receive in project design and implementation. No vegetation treatments would be conducted in both Parashant and Arizona Strip FO, except that fire use could be considered. No impacts to wildlife are anticipated.

Plains - Grassland Ecological Zone. Pronghorn antelope and Brewer's and Cassin's sparrow would benefit from being identified as priority species in this ecological zone due to the increased consideration these species would receive in project design and implementation. No vegetation treatments would be conducted in all three planning areas, except that fire use could be considered. No impacts to wildlife are anticipated.

Colorado Plateau Transition Ecological Zone. In Vermilion and Arizona Strip FO, no vegetation treatments would be planned in this ecological zone, though fire use could still be authorized. No impacts to wildlife are anticipated.

Impacts from Soil, Water and Air Resources

Impacts would be similar in nature and scope to those described under Alternative A.

Impacts from Fish and Wildlife

Impacts would be similar in nature and scope to those described under Alternative A, with the following additions:

Impacts to fish and wildlife resources from restoration and vegetation treatments and maintenance of these areas would be the same as those described under Alternative A, depending upon the method used.

In Parashant and Vermilion, providing access to public lands for the hunting and wildlife viewing would maintain routes through the wildlife habitat. Impacts to fish and wildlife resources from implementation of a transportation system would be the same as those described under Alternative A, Impacts from Trails and Travel Management. Identification of priority wildlife species would benefit these species by increasing consideration for these animals in project design and implementation.

Impacts from Special Status Species

Impacts would be similar in nature and scope to those described under Alternative A, with the following additions that apply only to Parashant:

Mechanical treatments would not be authorized in special status species habitats. This would reduce or eliminate potential adverse effects from the treatment to fish and wildlife species, but would also prevent realization of benefits to the species from the action.

Identification of priority special status species could benefit fish and wildlife resources depending upon the nature and timing of the actions and the degree of habitat use overlap between affected wildlife and the special status animals addressed.

Relict Leopard Frog. Introducing relict leopard frogs at Pakoon Springs or other locations within Parashant would have a major, permanent impact upon existing wildlife at these locations as site preparation would likely require large scale, high impact changes. Ponds at Pakoon Springs would require complete removal of water, vegetation, and soil sterilization to remove bull frogs.

Impacts from Minerals (Arizona Strip FO only)

For the Arizona Strip FO, impacts would be similar to those described under Alternative A.

Impacts from Livestock Grazing

Impacts would be the same as those described under Alternative A. The magnitude of these impacts would be less under this alternative than for any other due to the reduction in area available for grazing.

Impacts from Recreation

Impacts would be similar to those described under Alternative A.

Impacts from Lands and Realty

In the Monuments, impacts would be the same as those described under Alternative A. In the Arizona Strip FO, impacts could result from land tenure adjustments such as acquisition or disposal and issuance of ROWs. The magnitude of these impacts would be less for this alternative than for any other since fewer acres would be available for disposal.

*Alternative C*Impacts from Trails and Travel Management

Impacts to from management of the transportation system would similar to those described under Alternative A. However, due to the reduced number of roads open for public use under this alternative, the magnitude of impacts would be less than that of Alternatives A, D, and E, but greater than Alternative B.

Impacts from Wilderness Characteristics

In Parashant, construction of new wildlife catchments and other water developments would be limited or restricted in VRM Class I and Class II areas designed to maintain areas having wilderness characteristics. Design modifications and/or other mitigation would be applied to reduce or eliminate impacts to visual resources. “Substantially noticeable” wildlife water developments could be removed and the area restored, leading to long term adverse effects to wildlife resources.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be similar to those described under Alternatives B, with the following exceptions:

Riparian Ecological Zone. In Parashant, treatments could occur on up to 100 BLM and 20 NPS acres, more than Alternative B, but less than all other alternatives. The types of impacts would be the same as those described under Alternative A for the various treatment methods used.

Pakoon Springs Restoration: Restoration of processes and function at Pakoon Springs would result in minor, short-term direct impacts include injury, mortality, or removal of individuals or species. Major, long-term indirect impacts could include increased biomass productivity and improvement of wildlife habitat for target species.

Tassi Ranch and Springs Restoration: Restoration actions at Tassi Springs would result in minor, short-term direct impacts include injury, mortality, or removal of individuals or species. Major, long-term indirect impacts could include increased biomass productivity, and improvement of wildlife habitat for target species. Introduction of relict leopard frogs or other special status species could limit use of restoration tools that would result in adverse effects to other fish or wildlife species and could delay restoration.

Cane Springs Restoration: Fish and wildlife resources would benefit from closing this area to grazing by mitigating or eliminating impacts similar to those described under Alternative B, Livestock Grazing. Developing an interpretive site could result in minor, short and long-term impacts to wildlife by increasing visitation to the site, with subsequent increases in disturbance

and trampling, compaction and minor erosion of pathways and trails, and an increase in the likelihood of fire.

Paria River Invasive Plant Species Removal: Impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. Impacts could occur over a larger area under this alternative than under Alternative B, but less than all other alternatives.

In the Arizona Strip FO, restoration treatments within the Riparian ecological zone would have similar effects to those described under Alternative A for the various treatment methods used. The magnitude of these impacts would be less than for any other alternative except Alternative B, due to the limited acreage available for treatment.

Ponderosa Pine Ecological Zone. In Parashant, the types of impacts would be the same as those described under Alternative A for the various treatment methods used. Impacts could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

Mt. Trumbull Wilderness: In Parashant, the types of impacts would be the same as those described under Alternative A for the various treatment methods used. Impacts could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

In the Arizona Strip FO, restoration treatments within this ecological zone would have similar effects to those described under Alternative A for the various treatment methods used. The magnitude of these impacts would be less than for any other alternative except Alternative B, due to the limited acreage available for treatment.

Great Basin Ecological Zone. The types of impacts from vegetation treatments in sagebrush communities would be the same as those described under Alternative A for the various treatment methods used. Impacts in Parashant could occur over a larger area under this alternative than under Alternative B, the same area as under Alternative C, and less than under Alternative D. In Vermilion and the Arizona Strip FO, the magnitude of impacts would be less than for any other alternative except Alternative B, due to the limited acreage available for treatment.

The types of impacts from vegetation treatments in pinyon-juniper communities would be the same as those described under Alternative A for the various treatment methods used. Impacts could occur over a larger area under this alternative than under Alternative B, but less than all other alternatives.

Mojave Desert Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A, Vegetation and Fire and Fuels Management, Restoration and Vegetation Treatments. Refer also to Impacts to Vegetation Resources, Parashant, Alternative A, Vegetation and Fire and Fuels Management,

Chemical Vegetation Treatments. Impacts to this ecological zone could occur over a larger area under this alternative than under Alternative B, but less than under Alternative D.

In the Arizona Strip FO, restoration treatments within this ecological zone would have similar effects to those described for Impacts to Vegetation Resources, Parashant, Alternatives B and C, Vegetative Treatments. The magnitude of these impacts would be less than for any other alternative except Alternative B due to the limited acreage available for treatment.

Mojave-Great Basin Transition Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. In Parashant, impacts could occur over a larger area under this alternative than under Alternative B, the same area as Alternative C, but less than under Alternative D. In the Arizona Strip FO, the magnitude of would be less than for any other alternative except Alternative B due to the limited acreage available for treatment.

Interior Chaparral Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. In Parashant, impacts to this ecological zone could occur over a larger area under this alternative than under Alternative B, the same area as under Alternative C, but less than under Alternative D. In the Arizona Strip FO, the magnitude of impacts would be less than for any other alternative except Alternative B due to the limited acreage available for treatment.

Plains-Grassland Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. Impacts in all three planning areas could occur over a larger area under this alternative than under Alternative B, but less than all other alternatives.

Colorado Plateau Transition Ecological Zone. Impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. Impacts in Vermilion and the Arizona Strip FO could occur over a larger area under this alternative than under Alternative B, but less than all other alternatives.

Impacts from Soil, Water and Air Resources

Impacts would be similar in nature and scope to those described under Alternatives A.

Impacts from Fish and Wildlife

Impacts to fish and wildlife resources from wildlife management actions would be similar to those described under Alternatives B, except for the following decisions:

Under Alternative C, predator control actions would generally be limited to offending animals, but could be extended to efforts that would enhance the success wildlife transplants or augmentations. Impacts to wildlife resources would be similar in scope but greater in magnitude than those described for Alternative A.

In Parashant, new Watchable Wildlife areas would be proposed at Tassi Spring, Cane Spring, Pakoon Spring, and Oak Grove. Impacts to wildlife resources would be similar to those described for Alternative A, but these impacts would occur in more areas across the planning unit. In addition, Kaibab squirrel populations could be augmented in the Mt. Trumbull area. This action would benefit the species by increasing numbers and providing additional breeding opportunities for existing individuals.

In Vermilion, wildlife would be disturbed, injured, or killed by the additional visitation caused by promoting a Watchable Wildlife area for California condor viewing in the House Rock Valley.

In the Arizona Strip FO, promoting five new Watchable Wildlife areas would increase the level of disturbance to wildlife at these locations and could lead to minor to moderate long-term impacts from disruption of breeding, feeding, and sheltering activities.

Impacts from Special Status Species

In Vermilion and the Arizona Strip FO, impacts would be similar to those described under Alternative A. In Parashant, impacts would also be similar to those described under Alternative A, except for the following decisions that apply:

Mechanical treatments would not be authorized in special status plant habitats. This would reduce or eliminate potential adverse effects from the treatment to fish and wildlife species, but would also prevent realization of benefits to the species from the action.

Burrowing Owl. Augmenting existing burrowing owl populations and installing artificial nest burrows in the Pakoon Basin would have minor short-term impacts to wildlife species from surface disturbing actions associated with burrow construction. These impacts would not likely exceed two acres for each group of 16 burrowing owls released, or less than 10 acres total over the life of the plan. Where burrowing owl populations are successfully established, rodents and other prey species would be impacted. Individual prey species would be killed. Given the proliferation of rodents in these areas, the long term impacts to rodent populations would be minor or negligible. Where burrowing owls preyed upon desert tortoise young, long-term adverse effects to the species would occur (see Impacts to Special Status Species section).

Impacts from Minerals (Arizona Strip FO only)

In the Arizona Strip FO, impacts to fish and wildlife resources would be similar to those described under Alternative A.

Impacts from Livestock Grazing

Impacts would be similar to those described under Alternative A. In Parashant, the magnitude of impacts would be less than that of Alternative A, but greater than for Alternative B. In Vermilion, some 15,610 acres would be available for seasonal livestock grazing only. The duration of impacts in these areas would be shorter than for Alternative A, but longer than for Alternative B. In Arizona Strip FO, the magnitude of these impacts would be less than for any other alternative except Alternative B, due to the limited acreage available for grazing.

Impacts from Recreation

Impacts would be similar in nature and scope to those described under Alternative A.

Impacts from Lands and Realty

For the Monuments, impacts would be similar in nature and scope to those described under Alternative A. For Arizona Strip FO, impacts would be similar in nature and scope to those described under Alternative B.

Alternative D

Impacts from Trails and Travel Management

Impacts would be similar to those described under Alternative A. However, this alternative includes fewer miles of roads closed and more miles open to the public than any other alternative except Alternative A. As a result, impacts would occur over a larger area than other alternatives except Alternative A.

Impacts from Wilderness Characteristics

In Parashant, impacts would be the same as those described for the previous alternatives, but would occur over a smaller area. Wildlife resources could be impacted from disturbance associated with non-motorized competitive events. Depending upon the nature, location, and duration of the event, some wildlife may be injured or killed as a result of such activities.

Impacts from Vegetation and Fire and Fuels Management

Impacts to fish and wildlife resources from vegetation management actions would be similar to those described in Alternatives B, except for the following decisions:

Riparian Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. Impacts in Parashant could occur over the same area as under Alternative C. In Vermilion and Arizona Strip FO, the magnitude of these impacts would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

Pakoon Springs Restoration: Impacts would be similar to those described under Alternative C. Developing an interpretive site could result in minor, short- and long-term impacts to vegetation by increasing visitation to the site, in increased disturbance and risk of trampling, compaction and minor erosion of pathways and trails, and increased likelihood of fire.

Tassi Springs and Ranch Restoration: Impacts would be similar to those described under Alternative C.

Cane Springs Restoration: Impacts would be similar to those described under Alternative C.

Paria River Invasive Plant Species Removal: The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for each treatment method used. Impacts could occur over a larger area than for any other alternative.

Ponderosa Pine Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for each of the various treatment methods used. In Parashant, impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A. In the Arizona Strip FO, the magnitude of these impacts would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

Mt. Trumbull Wilderness – The types of impacts would be the same as those described under Alternative A for the various treatment methods used. Impacts could occur over a larger area under this alternative than under any other alternative with the exception of Alternative A.

Great Basin Ecological Zone. The types of impacts from vegetation treatments in sagebrush communities would be the same as those described under Alternative A for the various treatment methods used. Impacts in Parashant could occur over the same area as under Alternative C. In Vermilion and the Arizona Strip FO, the magnitude of impacts would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

The types of impacts from vegetation treatments in pinyon-juniper communities would be the same as those described under Alternative A for the various treatment methods used. In all three planning areas, the magnitude of impacts would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

Mojave Desert Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. Impacts in Parashant could occur over the same area as under Alternative C. In the Arizona Strip FO, the magnitude of impacts would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

Mojave-Great Basin Transition Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. Impacts in Parashant could occur over the same area as under Alternative C. In the Arizona Strip FO, the magnitude of impacts would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

Interior Chaparral Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. Impacts in Parashant could occur over the same area as under Alternative C. In the Arizona Strip FO, the magnitude of impacts would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

Plains-Grassland Ecological Zone. The types of impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. The magnitude of impacts in all three planning areas would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

Colorado Plateau Transition Ecological Zone. Impacts from vegetation treatments in this ecological zone would be the same as those described under Alternative A for the various treatment methods used. The magnitude of impacts in Vermilion and Arizona Strip FO would be less than under Alternative A, greater than under Alternatives B and C, and equal to Alternative E.

Impacts from Soil, Water and Air Resources

Impacts would be similar in nature and scope to those described under Alternatives A.

Impacts from Fish and Wildlife

In Parashant, impacts would be similar to those described under Alternative C.

Impacts from Special Status Species

Impacts in Vermilion and the Arizona Strip FO would be the same as described under Alternative A. Impacts in Parashant would be similar to those described under Alternatives C, with the following exceptions:

Mechanical treatments would not be authorized in listed or proposed species habitats. This would reduce or eliminate potential adverse effects from the treatment to fish and wildlife species, but would also prevent realization of benefits to the species from the action.

Desert Tortoise. De-designation of the Pakoon ACEC would have a negligible affect on wildlife management within the area would continue unchanged. Removal of the Grand Wash portion of the ACEC from the protected portion of the DWMA would reduce or eliminate some of the protective measures afforded other species. Such actions could include various types of restoration or vegetation treatment actions that would be restricted or not authorized within the DWMA. These effects would be negligible as even those areas of desert tortoise habitat outside the DWMA receive substantial protection as a result of being within the Monument and within the critical habitat boundary for the tortoise.

Burrowing Owl. Impacts to wildlife resources as a result of implementation of burrowing owl decisions under Alternative D would be the same as those described under Alternative C.

Impacts from Minerals (Arizona Strip FO only)

In the Arizona Strip FO, impacts would be similar to those described under Alternative A.

Impacts from Livestock Grazing

Impacts would be similar in nature and scope to those described under Alternative A. The magnitude of adverse effects would be less than that of Alternatives A and D, but greater than for other alternatives.

Impacts from Recreation

In Parashant, impacts would be similar in nature and scope to those described under Alternative A. In Vermilion, impacts would be similar to those described under Alternative C. In the Arizona Strip FO, the magnitude of impacts would be greater than for any other alternative except Alternative A, due to the increase in the area available for livestock grazing.

Impacts from Lands and Realty

For the Monuments, impacts would be similar to those described under Alternative A. For Arizona Strip FO, impacts would be similar to those described under Alternative B.

Alternative E: Preferred**Impacts from Trails and Travel Management**

Impacts would be similar to those described under Alternative A. In Parashant, however, due to the reduced number of roads open for public use under this alternative, the magnitude of impacts would be less than that of Alternative A, but greater than for Alternatives B, C, and D. In Vermilion, this alternative includes more miles of roads closed and fewer miles open than Alternatives A and D. As a result, the magnitude of impacts would be less than that of Alternatives A and D, but greater than Alternatives B and C. In Arizona Strip FO, as with Alternative D, the increase in number of miles of roads open and a decrease in miles closed would lead to impacts over a larger area than other alternatives except Alternative A.

Impacts from Wilderness Characteristics

Impacts would be similar to those described under Alternative D.

Impacts from Vegetation and Fire and Fuels Management

Impacts to fish and wildlife resources from vegetation management actions would be similar to those described in Alternative B, except for the following decisions:

Riparian Ecological Zone. In Parashant, impacts would be similar to those described under Alternatives C. In Vermilion and Arizona Strip FO, impacts would be similar to those described under Alternative D.

Pakoon Springs Restoration. Impacts would be similar to those described under Alternative D.

Cane Springs Restoration. Impacts would be similar to those described under Alternative D.

Paria River Invasive Plant Species Removal: Impacts would be the same as those described under Alternative D.

Great Basin Ecological Zone. In Parashant, impacts would be the same to those described under Alternative C. In Vermilion, impacts would be the same as those described under Alternative D.

Mojave Desert Ecological Zone. In Parashant, impacts would be the same as those described under Alternative C. In Arizona Strip FO, impacts would be the same as those described under Alternative D.

Mojave - Great Basin Transition Ecological Zone. In Parashant, impacts would be the same as those described under Alternative C. In Arizona Strip FO, impacts would be the same as those described under Alternative D.

Ponderosa Pine Ecological Zone. In Parashant, impacts would be the same as those described under Alternative C. In Arizona Strip FO, impacts would be the same as those described under Alternative D.

Mt. Trumbull Wilderness. In Parashant, impacts would be the same as those described under Alternative D.

Interior Chaparral Ecological Zone. In Parashant, impacts would be the same as those described under Alternative C. In Arizona Strip FO, impacts would be the same as those described under Alternative D.

Plains - Grassland Ecological Zone. In all three planning areas, impacts would be the same as those described under Alternative D.

Colorado Plateau Transition Ecological Zone: In Vermilion and Arizona Strip FO, impacts would be the same as those described under Alternative D.

Impacts from Soil, Water and Air Resources

Impacts would be similar in nature and scope to those described under Alternative A.

Impacts from Fish and Wildlife

Impacts to fish and wildlife resources from wildlife management actions would be similar to those described under Alternative C.

Impacts from Special Status Species

In Vermilion and the Arizona Strip FO, impacts would be similar to those described under Alternative A. In Parashant, impacts would be similar to those described under Alternative D, with the following exceptions

Desert Tortoise. De-designation of the Pakoon ACEC would have a negligible affect on desert tortoise as management within the area would continue unchanged. The Grand Wash portion of the ACEC would still be included within the DWMA, as in Alternative B.

Burrowing Owl. Burrowing owl augmentations would not occur, as in Alternative A.

Impacts from Livestock Grazing

Impacts would be similar in nature and scope to those described under Alternative A. In Parashant, The magnitude of adverse effects would be less than that of Alternatives A and D, but greater than for other alternatives. In Vermilion, impacts would be similar to those described under Alternative B. In the Arizona Strip FO, impacts would be similar to those described under Alternative D.

Impacts from Recreation

Impacts to special status species would be similar in nature and scope to those described under Alternative A.

Impacts from Lands and Realty

For the Monuments, impacts would be similar in nature and scope to those described under Alternative A. For Arizona Strip FO, impacts would be similar in nature and scope to those described under Alternative B.

Cumulative Impacts

The geographic area for analysis of cumulative impacts to fish and wildlife resources is the three planning areas. Development pressure exists throughout the southwestern U.S., particularly in and adjacent to sources of water. As a result, community expansion has had negative impacts on fish and wildlife resources.

Community expansion has also led to increased pressure for water and developable lands. Land disposals have reduced available wildlife habitat in the Mojave Desert portions of the Planning Areas by up to 400 acres since 1973. Issuance of ROWs has also reduced these habitats by as much as 1,859 acres over the same time period. Acquisition of sensitive habitats has increased protection of the species by shifting management emphasis toward conservation.

Demand for water for industrial, irrigation, and culinary use has had major long-term effects on fish and wildlife resources. Disruptions of flow regimes from dams and diversions have altered habitat for fish and riparian dependent species. Reductions in water quality have had similar long-term effects. Introduction of non-native plants and animals have resulted in impacts from competition for resources, trampling, predation, injury, and death. Tamarisk invasion in riparian areas has resulted in reductions of flow for native fishes, reductions in the overall size of the vegetative community, increased temperature and salinity, and increased risk of fire.

Wildfires have reduced available Mojave Desert habitat by many thousands of acres through conversion of the vegetation from native communities to exotic annual grasses. Livestock grazing has increased the probability of wildlife being trampled. During years of drought and/or

low productivity, livestock grazing has reduced forage availability for species that share habitats with them. Some 128,005 acres of desert tortoise habitat were closed to livestock grazing since 1996. An additional 144,027 acres of desert tortoise habitat have seasonal grazing restrictions. Mineral development has led to reduction of habitat quality and physical disturbance in a variety of habitats.

Recreational pursuits, particularly OHV use, have caused disturbance to most all species and their habitats. With the increase in local populations has come a dramatic increase in the level of OHV use, resulting in increased disturbance, injury, and mortality to fish and wildlife, particularly ground dwelling species with low mobility. Transportation corridors exist through the habitat of virtually all species found within the Planning Areas. Impacts vary by species and by the location, level of use, and speed of travel over the road. In some areas the habitat has been rendered unusable to species with narrow tolerances by long-term recreational use.

Implementation of plan decisions is expected to improve conditions for most species of fish and wildlife by focusing management attention and reducing or eliminating actions that lead to impacts.

Impacts from livestock grazing on Mojave Desert species would be minimize due to proposed closures. Water use in the region would continue to increase, affecting flows in the Virgin River, and continuing to cause a decline in populations of native fish and riparian dependent species. Efforts to remove or reduce tamarisk would increase in scope and size, leading to localized impacts but ultimately increasing the size and quality of habitat for riparian dependent species. Reduction in tamarisk would also increase flows for Virgin River fishes.

Increased demand for land for community services and recreational uses would occur, particularly in the area around Mesquite and Littlefield/Beaver Dam. Assuming land ownership follows the preferred alternative for this RMP, impacts would continue to increase at modest levels. The demand for new lands for development would likely lead to development of one or more Habitat Conservation Plans.

SPECIAL STATUS SPECIES

Special status species include both plants and animals that are federally or state listed, proposed or candidates for these lists, or included on the BLM and NPS sensitive species list. Because many special status species have very narrow habitat requirements and low tolerance for change, even small modifications to vegetation in their environment can lead to pronounced effects on the species. As a result, the majority of impacts to these species and their habitat have previously been discussed in the Vegetation and Fish and Wildlife sections.

Impacts to special status species from other management programs in the Planning Area include loss or alteration of native habitats, increased invasion of noxious weeds and other exotic weed species, decreased water availability, increased habitat fragmentation, changes in habitat and

species composition, disruption of species behavior leading to reduced reproductive fitness and/or increased susceptibility to predation, and direct mortality of individuals. Surface disturbing actions that alter vegetation characteristics (e.g. structure, composition, and/or production) have the potential to affect habitat suitability for special status plants or animals, particularly where the disturbance removes or reduces cover and/or food resources. Even minor changes to vegetation communities have the potential to affect special status species.

Direct impacts to special status species from management activities may result in mortality or displacement of individuals, disturbance in reduced air or water quality, and alteration of immediate environments through loss of or changes to key habitat components. Positive or negative effects are possible. Key habitat components include food availability or quality, cover from predators, thermal refugia, nesting/roosting/denning habitat, water availability and quality, travel corridors, etc. Direct impacts may affect individuals, populations, or habitats for the duration of the action, for a few days thereafter, for several growing seasons, or may continue indefinitely where the action results in permanent habitat loss.

Indirect impacts to special status species from management activities typically result from influences of post-disturbance succession, recovery, or rehabilitation of the habitat. Positive or negative effects are possible. These impacts may be long-term, depending on the severity of the habitat alteration, and may change species assemblages (relative abundances or species composition), species behaviors, or overall population trends, benefiting some species and negatively affecting others.

Methods and Assumptions

To analyze the potential effects of the alternatives on special status species, information was gathered from existing inventories, recovery plans, conservation agreements, State Heritage database files, relevant scientific literature, computer habitat models, and other sources identifying the potential distribution of these species in and adjacent to the Planning Area. The analysis is also based on professional expertise of BLM specialists at the Arizona Strip FO and the NPS staff at Lake Mead NRA, knowledge of the area, and a review of the relevant scientific literature. For most species described in Chapter 3, habitat inventories have been completed and distributions within the Planning Area have been mapped.

To comply with Section 7 of the Endangered Species Act, a Biological Assessment (BA) will be prepared to address impacts and mitigating measures on threatened and endangered species. See Appendix 2.E

In making effects determinations, BLM and NPS staff considered how the effects of the action would affect any and all listed or proposed species known or suspected to occur in an area. Effects were measured against information about threats found in the Federal Register notice describing the listing of the species, and the potential for the action to modify designated or

proposed critical habitat. Direct and indirect effects were considered together with effects of activities that are interrelated or interdependent.

Effects are quantified where possible. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible:** The effect to special status wildlife and/or plants would be at or below the level of detection, and the changes would be so slight that they would not be of any measurable or perceptible consequence to individuals or the population as a whole.
- Minor:** The effects on special status wildlife and/or plants would be detectable but localized, small, and of little consequence to the population of any species. Mitigating measures, if needed to offset adverse effects, would be simple and successful.
- Moderate:** The effects on special status wildlife and/or plants would be readily detectable and localized, with potential consequences at the population level. Mitigating measures, if needed to offset adverse effects, would be extensive and would probably be successful.
- Major:** The effects on special status wildlife and/or plants would be obvious and would result in substantial consequences to the populations in the region. Extensive mitigating measures would be needed to offset adverse effects, and their success would not be guaranteed. Actions that would likely result in effects to special status species of this severity would not be authorized or undertaken.

The duration of impacts to special status species was defined as follows:

- Short-term:** The effect would generally last less than a single year or season.
- Long-term:** A change in a resource or its condition would last longer than a single year or season.

The following assumptions regarding special status species are made:

- Special status species habitat would be managed for the benefit of those species as a priority over other resources allocations and uses.
- All surface disturbing activities would include mitigation to reduce impacts to special status species and their habitat. Conservation measures developed for each listed or proposed species (Appendix 2.E) would be applied to any proposed project within the

habitat of that species. Analysis of impacts and effects determinations would include any and all mitigation and conservation measures.

- While most surface disturbing activities would not be authorized in special status species habitats, the planning decisions do not prohibit such actions. Inclusion of these decisions reflects the desire for an adaptive approach and allows for use of techniques that might be developed in the future. As a result, the analysis of environmental consequences and the determination of effects to special status species provide a worst case approach. The analysis includes implementation of decisions that would not typically be applied to special status species habitats.
- Prior to any surface disturbing activity, a special status species review would occur to determine whether any such species would be present in the project area.
- Any determination of May Affect would trigger ESA Section 7 consultation with the U.S. Fish and Wildlife Service. A separate biological assessment would be prepared for this consultation.
- Four listed species are found in Parashant: desert tortoise (threatened), bald eagle (threatened), Mexican spotted owl (threatened), and California condor (10J, proposed). Other special status species present are discussed in Chapter 3.
- Four listed species are found in Vermilion: bald eagle (threatened), Mexican spotted owl (threatened), California condor (10J, proposed), and Welsh's milkweed (endangered). Other special status species present are discussed in Chapter 3.
- Twelve listed species are found in the Arizona Strip FO: desert tortoise (threatened), woundfin minnow (endangered), Virgin chub (endangered), bald eagle (threatened), southwestern willow flycatcher (endangered), Yuma clapper rail (endangered), California condor (10J, proposed), Mexican spotted owl (threatened), Brady pincushion cactus (endangered), Holmgren milk-vetch (endangered), Jones' cycladenia (threatened), and Siler pincushion cactus (threatened). Other special status species present are discussed in Chapter 3.

Impacts to Special Status Species

Impacts to special status species in the Planning Area would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Vegetation and Fire and Fuels Management
- Air, Water, and Soil
- Fish and Wildlife
- Special Status Species
- Minerals (Arizona Strip FO only)
- Livestock Grazing
- Recreation
- Lands and Realty Management

*Alternative A: No Action*Impacts from Trails and Travel Management

Roads affect special status species by fragmenting habitat; reducing available habitat for breeding and foraging activities; providing access corridors for weed invasion, hunting, pollution, wildfires, and habitat-altering projects; increasing erosion; and increasing opportunities for collisions and variety of other disturbances that change wildlife movement and habitat use. Due to the number of miles of road open for public use under this alternative, the magnitude of impacts would be greater than for any other alternative.

However, road miles are not all equal in their effects on wildlife resources due to variables such as road widths, location, traffic type, speed, and volume. In general, the lower the speed and volume of traffic, the lower the likelihood of collision. Most scientific literature concerning the effects of transportation systems on wildlife species are based on paved roads with high traffic volumes, traveling at high rates of speed. However, only a few roads in the Arizona Strip FO are paved and none of the roads within the Monuments are currently paved. The average speeds for most roads in the Planning Area are generally less than 35 mph. There are no plans to pave or authorize paving of any roads in the Monuments through the life of this Plan.

In general, little vegetation grows within the roadway. Since all transportation is limited to designated roads and trails, few if any direct impacts to special status plants would be expected. Minor, short-term indirect impacts could result from dust from traffic on the designated transportation system. Increased access into areas could lead to an increase in foot traffic or unauthorized off-road vehicle use in special status plant habitat.

Desert Tortoise (Parashant and Arizona Strip FO): Desert tortoise may be injured or killed as a result of collisions with vehicles traveling on the existing transportation system. The Desert Tortoise Recovery Plan (USFWS 1994) found that paved highways, unpaved and paved roads, trails, and tracks have profound impacts on desert tortoise populations and habitat. Collisions with tortoise are infrequent in the Planning Area, probably due to the low traffic volume and speeds of vehicles. Speed limits would continue to apply to vehicles associated with authorized actions in the Pakoona DWMA/ACEC.

In addition to providing many opportunities for accidental mortality, roads also act as a barrier to tortoise dispersal, fragment habitats (USFWS 1994, Boarman 2002), and provide access to remote areas. Impacts to desert tortoise dispersal and the degree of habitat fragmentation are difficult to assess, but are anticipated to be negligible to minor. All roads in Parashant and most roads in the Arizona Strip FO are unpaved, narrow routes with little to no crown. Drainage bars that drain perpendicular to the roadway are used rather than parallel ditches that might trap a tortoise. However, in the Arizona Strip FO, Interstate 15 acts as a permanent physical barrier to movement that isolates the Beaver Dam Slope and the Virgin Slope tortoise populations. County route 91 southwest of Littlefield, Arizona, also fragments these two populations. North of

Littlefield, vehicle traffic on route 91 is a source of tortoise mortality, though the populations on either side of the route are still somewhat connected.

At least 62 percent of desert tortoise habitat within the Planning Area is within 0.5 miles of a route (Thompson, et. al 2004). No new permanent roads or trails would be constructed, and maintenance would continue at current standards. The construction of new, temporary roads to facilitate project implementation would result in moderate short-term direct impacts to desert tortoise, as some individuals would be injured, killed, or displaced during construction and rehabilitation work.

Negligible to moderate short-term direct impacts could occur to desert tortoise from maintenance activities, including localized loss of habitat, disturbance, injury, or death of individual animals. Road maintenance improves conditions for vehicle travel, facilitating vehicular use and higher speeds. Such conditions may lead to increased injury or mortality of tortoises on roads. Tortoises could also be crushed on roads by a road grader. Maintenance often involves grading into washes to improve drainage off the road. Tortoises could be injured in drainages, and burrows constructed in the banks of washes could be damaged or destroyed. Tortoises could be trapped in collapsed burrows following road maintenance. Under this alternative, the potential for injury to or mortality of tortoises during maintenance activities would be limited by restricting non-emergency maintenance to the tortoise inactive season (October 15 to March 15).

Rehabilitation of closed roads or temporary roads where use is no longer required would have moderate short and long-term direct and indirect impacts depending upon the habitat and the closure method. Short-term direct impacts would include construction noise and dust and disturbance from human activity. Other direct impacts include displacement, loss of habitat, injury, or death of individuals during the rehabilitation phase. Indirect effects include increased access into previously unused areas of tortoise habitat.

Following completion of rehabilitation actions, effects to desert tortoise would be similar to those described above for new temporary roads, depending upon the methods used. In addition, long-term benefits to desert tortoise would result from closing and rehabilitating roads through their habitat by eliminating or reversing many of the adverse effects described above.

Brady Pincushion Cactus, Holmgren Milk-vetch, Jones' Cycladenia, and Siler Pincushion Cactus (Arizona Strip FO only): Impacts to these listed plant species from implementation of the travel management system include reduced fitness as a result of dust, physical disturbance, and injury or mortality where vehicles drive over plants. Of these species, only Jone's cycladenia populations are located far enough from existing roads as to be at low risk from vehicles. Both Brady and Siler pincushion cactus populations are sufficiently close to roads as to be at risk from vehicles turning around or pulling off the road to camp. Holmgren milk-vetch and Siler pincushion cactus populations are located within areas commonly used by OHVs, though these areas are not open to off-road vehicle use. Impacts to these species are greatest following wet weather.

Impacts from Vegetation and Fire and Fuels Management

Vegetation and Fire and Fuels Management could affect special status species as described below. The scope and intensity these impacts, particularly long-term changes to habitat quality, would be minimized by implementation of conservation measures (Appendix 2.E).

Restoration and Vegetation Treatments: During restoration treatments, effects to special status species and their habitat could include disturbance of breeding, feeding, and sheltering activities; temporary or permanent loss of habitat or components; increased habitat fragmentation; increased susceptibility to predation; forced emigration; and/or direct injury or mortality. Reclamation of sites previously disturbed by facility development would have minor short and long term direct and indirect impacts. Short-term minor direct impacts would include reestablishment of native vegetation. Long-term minor direct impacts would include reestablishment of vegetation structure. Short-term minor indirect impacts would include reduced erosion and compaction, and increased infiltration. Long-term minor indirect impacts could include increased vegetation productivity.

Reclamation actions such as re-contouring, ripping compacted areas, replacing topsoil, seeding, planting, etc. could injure or kill individuals. The magnitude of anticipated impacts would vary by the treatment method used, but would generally vary from minor to moderate, particularly for plants or animals with low mobility.

Following vegetation treatment increased invasion of noxious weeds and other exotic weed species, decreased water availability, and long-term changes in habitat and species composition could occur. The duration of these effects would vary by treatment method, habitat, and community type, availability of appropriate seed, and amount and timing of precipitation. Temporary or permanent reductions in water quantity, quality, or access could lead to the same anticipated effects. Vegetation treatments in riparian areas that result in successful reduction of tamarisk and other invasive exotics would ultimately benefit most riparian dependent species, though treatments would initially have adverse effects.

Mechanical and chemical treatment methods could result in localized, short-term impacts to air quality, including fugitive dust, emission/exhaust from equipment, and chemical fumes. Temporary reduction in air quality could lead to reduced fitness, increased susceptibility to predation, or mortality among wildlife species.

Vegetation Products Use/Sale: Use and/or sale of vegetation products would not be authorized in Vermilion. Harvest of vegetative materials such as native seed, pinyon nuts, posts, and fuelwood, would not be authorized in Parashant and the Arizona Strip FO unless associated with a research or restoration project. This would effectively limit such uses to a limited area under close monitoring. Post cutting, collection of dead and downed wood for campfires, Christmas tree harvest, and collection of pinyon nuts would have negligible to moderate direct and indirect

affects on some special status species. Direct effects include disturbance of individuals at breeding, feeding, or sheltering sites; loss of cover or similar habitat features; injury or death; increased risk of fire; increased risk of predation; and nest abandonment. Indirect effects to species would include loss of forage or cover species, increased soil surface temperatures, and short or long-term changes in species composition and/or community structure. Impacts resulting from fuelwood harvest associated with restoration projects could lead to nest abandonment among special status bird species. Salvage of vegetation that would be destroyed through surface disturbing activities would not be authorized in the Planning Area under this alternative.

Noxious Weeds: Management of noxious weeds may cause temporary negligible to moderate impacts to non-target plant species depending upon the method used (see Impacts to Vegetation section). Assuming proper application of approved herbicides, noxious weed management would be expected to have minor to moderate impacts to special status plants and negligible to minor effects on special status animals. Treatments designed to decrease or eliminate noxious weeds would benefit native vegetative communities by reducing or eliminating competition with noxious weeds, increasing forage and cover values, and restoring native vegetative communities, though such benefits would be long-term.

Fire Suppression, Use, and Management: Effects of fire on special status species depend upon the severity of the fire and the methods and intensity of suppression efforts. Direct effects of wildfire, prescribed fire, and fire suppression activities include injury or death of individuals or local populations; disturbance/displacement from breeding, feeding, and/or sheltering activities; and increased risk of predation. Wildfires may leave the surrounding soil and accumulated ash vulnerable to erosion and remove shading streamside vegetation, increasing sedimentation and water temperature. Indirect effects could include reduction in plant vigor or animal health, alteration or loss of plant communities, loss of seed-dispersal mechanisms, increased light penetration and temperatures, loss of cover, etc. Chemical retardants in the water may have adverse effects on vegetation and/or wildlife that forage upon them. Direct and indirect impacts from most suppression techniques would be short-term, temporary, and localized, particularly if sensitive habitats are mitigated or avoided. The timing of prescribed fire could minimize impacts. Refer to Impacts to Fish and Wildlife from Vegetation and Fire and Fuels Management for a more detailed discussion.

Effects to Special Status Species: Impacts from restoration and vegetation treatments would vary by the method used to accomplish the treatment. Where fuel loads are excessive, failure to conduct vegetation treatments increase the risk of catastrophic fire and lead to loss of individuals or habitat.

Desert Tortoise (Parashant and Arizona Strip FO only): Authorization of vegetation treatment projects in desert tortoise habitat is unlikely. However, should such treatments occur, adverse effects would likely result to desert tortoise. Vegetation treatment projects would not be authorized in desert tortoise habitat during the active season (March 15 to October 15). Use of

non-native seeds could lead to negligible to moderate adverse effects by replacing native species, rendering habitat unusable, and/or increasing fire frequency.

The Pakoon DWMA/ACEC in Parashant and the desert tortoise ACECs in the Arizona Strip FO would be closed to the collection of vegetative products. Use and/or sale of vegetation products outside the DWMA/ACEC would have localized, negligible to minor impacts on desert tortoise. Few, if any, woodland products are available in desert tortoise habitat.

Noxious weed treatments in desert tortoise habitat may include chemical treatments. Effects of these actions on desert tortoise are expected to be negligible to minor. Desert tortoise should benefit from reduction or elimination of noxious weeds.

Desert tortoise habitat in the Mojave Desert has been severely altered from a variety of causes, leaving these non-fire-adapted habitats at risk from severe wildfires. The BLM and NPS would continue to monitor research on biological and chemical control that may be useful in the future to reduce exotic vegetation and restore habitat. The BLM and NPS would not use chemical or biological treatments in occupied or critical habitat for tortoises, as these tactics would not be effective in thinning or removing accumulations of fuel loads or in restoring habitat conditions in this vegetation type. Similarly, because this habitat has a low tolerance to fire or mechanical treatments, The BLM and NPS would not implement wildland fire use, prescribed burning, or mechanical treatments in habitats occupied by tortoises or designated as critical habitat.

Fire suppression operations in habitat supporting desert tortoise could protect critical habitat from long-term effects from fire. However, fire suppression operations could also adversely affect tortoises and lead to modifications of critical habitat. Direct effects would occur from setting backfires, fireline construction, retardant drops, construction and use of staging areas within the habitat, and use of vehicles associated with suppression activities. Establishment of campsites and aircraft landing/fuel sites could result in death or injury of tortoises. Indirect effects to desert tortoise from wildfire suppression could include reduction in quantity and/or quality of forage, soil disturbance or compaction, removal of vegetative cover for thermal protection and predator avoidance, and human disturbance. Creation of new routes used in fire suppression may facilitate OVH use and associated habitat damage, as well as crushing of tortoises by vehicles or collection of animals as pets. Refuse left by fire crews could attract desert tortoise predator, such as ravens and coyotes. Effects to tortoises and their habitat from human disturbance associated with fire suppression activities would be short-term, ending when the suppression actions are complete.

Mexican Spotted Owl: Although BLM believes that Mexican spotted owls do not currently breed within the Planning Area, owls may occasionally use the area for roosting, wintering, and dispersal/or. In the unlikely event that an undetected owl was present during vegetation management activities, effects to the species would be similar to those described for vegetation treatments above.

Use and/or sale of vegetation products in Parashant and the Arizona Strip FO would have localized, negligible to minor impacts Mexican spotted owl. Preferred nesting habitat for the species is cool, shady, steep-walled canyons. Such areas generally are too steep and have too few trees to be suitable for woodland products harvest.

Impacts from implementation of noxious weed management actions would be similar to those described for vegetation treatments above. Effects of these actions on Mexican spotted owls are expected to be negligible. Owls should benefit from reduction or elimination of noxious weeds in their habitat.

In the unlikely event that an undetected owl was present during prescribed fire or fire suppression activities, adverse effects could occur depending upon the proximity to the animal. Low-flying aircraft, helispots, spike camps, or handline construction could disturb an undetected owl if the facilities or activities were located close to an unknown roosting site. In addition to habitat alteration, mortality, injury, disturbance, or displacement of owls could result from these activities. Undetected owls could also be disturbed by smoke, noise, and other human activity associated with these fire management activities. Depending on the proximity to the fire, the bird should be able to relocate to an adjacent habitat area to escape disturbance.

Because of their great mobility, the lack of suitable roosting sites, lack of any previous observations, and lack of concentrated food sources, the potential for effects from vegetation management actions, including Fire Suppression, is considered negligible.

Bald Eagle: Although bald eagles do not currently breed within the Planning Area, they may occasionally use the area for foraging and roosting during the winter. In the unlikely event that a bald eagle was present during vegetation management activities, effects to the species would be similar to those described for vegetation treatments above.

Use and/or sale of vegetation products in Parashant and the Arizona Strip FO would have localized, negligible impacts to bald eagles. Preferred roosting habitat for eagles would be open areas with elevated perches. Forest habitats where the woodland products harvest would occur would generally be too dense for bald eagle roosts or perches. In addition, there are no large water sources or other areas of concentrated prey availability within the Planning Areas.

Impacts from implementation of noxious weed management actions would be similar to those described for vegetation treatments above.

In the unlikely event that an undetected bald eagle was present during prescribed fire or fire suppression activities, adverse effects would occur depending upon the proximity. Anticipated impacts would be similar to those described above for Mexican spotted owls.

Because of their great mobility, the lack of suitable roosting sites, lack of any previous observations, and lack of concentrated food sources, the potential for effects from vegetation management actions, including fire suppression, is considered negligible.

California Condor: Condors may experience direct effects from mechanical or chemical fuel treatments in their nesting, roosting, or foraging territories. However, because of the specific, targeted nature of these methods, the gradual changes to vegetation, and the ability to avoid condors during application of the treatment, the potential for adverse effect is considered very low. Even large-scale operations such as chainings or pushes in pinyon-juniper habitat or restoration thinning in ponderosa pine should have little effect on condors due to their very low level of anticipated use in these habitats.

Use and/or sale of vegetation products in Parashant and the Arizona Strip FO would have localized, negligible impacts to condors. Preferred roosting habitat for condors would be open areas with elevated perches. Woodcutting, Christmas tree harvest and other actions that lead to loss of trees or snags could lead to direct effects if roost trees are removed. However, forest habitats where the woodland products harvest would occur would generally be too dense for California condor roosts or perches.

Impacts from implementation of noxious weed management actions would be similar to those described for vegetation treatments above. Effects of these actions on California condor are expected to be negligible.

In the unlikely event that a California condor was present during prescribed fire or fire suppression activities, adverse effects would occur depending upon the proximity. Low-flying aircraft, helispots, spike camps, or hand-line construction could disturb condors if the facilities or activities were located close to a roost or nesting site. In addition to habitat alteration, mortality, injury, disturbance, or displacement of condors could result from these activities.

Condors could also be disturbed by smoke, noise, and other human activity associated with these fire management activities. Because condors find their food visually, smoke could interfere with the ability of foraging birds to locate carcasses. Smoke could also make it harder for flying condors to see obstacles such as aircraft or electrical transmission lines and increase the risk of a collision. Smoke may also disturb breeding or foraging activities of condors. Condors may experience reduced foraging or breeding fitness due to inhalation of smoke and ash.

Other indirect effects to California condors may include long-term changes in their food supply, loss or changes to foraging habitat, and loss of roosting habitat in woodland habitats resulting from wildland or prescribed fire. However, because condors find their food visually and because wildland and prescribed fires would open up a closed canopy woodland and make hidden carcasses more visible, the burning of thickly vegetated habitats would be beneficial to condors. Because condors are a mobile species, the potential for direct effects from fire suppression and use activities is low. In addition, conservation measures (Appendix 2.E) would be implemented,

including pre-season and pre-mission briefings for fire suppression crews, pilots, and helitack crews; minimum altitudes and flight distances in known condor areas; mandatory resource advisor on fires in condor areas; making daily contact with Peregrine Fund personnel to determine location of condors; covering dip tanks to minimize collisions; and minimizing attractants such as trash. Helispots would generally be constructed away from areas used by condors.

Implementation of vegetation management decisions would lead to mostly negligible to minor effects to condors. However, because condors are known to nest within Vermilion and may at some point nest within Parashant and the Arizona Strip FO, disturbance at a nest site is a possibility.

Southwestern Willow Flycatcher and Yuma Clapper Rail (Arizona Strip FO only): Special status bird species dependent upon riparian vegetation may be affected by implementation of vegetation treatments, collection of fuelwood for campfires, and fire use and/or suppression actions within the riparian corridor.

Effects to Southwestern willow flycatcher and Yuma clapper rail from implementation of vegetation treatments or restoration projects would vary by the method of treatment used. As with desert tortoise, vegetation treatment projects would generally not be proposed in habitat of these listed species except where doing so would enhance survival and recovery of these species. Direct effects could include disturbance, injury, or mortality from personnel or vehicles in or adjacent to nesting habitat, nest abandonment, and loss of habitat. Indirect effects would include reduced fitness or mortality resulting from loss of vegetative cover, increased temperatures at nesting sites from loss of shading, reduction or loss of available nest sites, reduction or loss of food resources, and increased risk of predation and/or nest parasitism. Effects would vary from short to long-term.

Under this Alternative, the sale of vegetation products in the Virgin River Corridor ACEC would not be authorized. However, there is no prohibition against such actions within the riparian zone at Kanab Creek. In addition, impacts could result from collection of firewood for personal use. Direct, negligible to minor impacts could result if nests are disturbed during collection of wood. This is not considered a likely occurrence. Generally, little if any fuelwood is available in habitat areas for these species. However, collection of firewood could reasonably be expected for building a campfire. Campfires increase the probability of fire escaping and burning through the habitat area. Impacts from fire use and suppression are described below.

Effects from fire use and suppression include direct effects such as disturbance, injury, or mortality from use of vehicles associated with fire suppression, impacts to eggs or nest structures from foam retardants or water drops, nest abandonment, mortality from construction of fire line through habitat, and loss of individuals from the fire itself. Indirect effects include reduced fitness resulting from the actions described above.

Woundfin Minnow and Virgin River Chub (Arizona Strip FO only): Native Virgin River fishes may be affected by implementation of vegetation treatments and fire use and/or suppression actions within the riparian corridor.

Effects to Virgin River fishes from implementation of vegetation treatments or restoration projects would vary by the method of treatment used. As with desert tortoise, vegetation treatment projects would generally not be proposed in listed fish habitats except where doing so would enhance survival and recovery of these species. Direct effects could include disturbance, injury, or mortality from use of vehicles associated with vegetation treatments, toxicity from chemical treatments or spills, or physical removal of habitat. Indirect effects would include reduced fitness or mortality resulting from loss of vegetative cover, increased temperature from loss of shading, increased sedimentation from erosion in surrounding watersheds, reduction or loss of hiding cover, reduction or loss of food resources, and the potential for increased predation. Effects would vary from short to long-term.

Fish are affected by fire and fire suppression in a variety of ways. Direct effects include disturbance, injury, or mortality from use of vehicles associated with fire suppression, toxicity from chemical spills or use of foam retardants, and the potential for fish to be sucked into water pumps or similar equipment. Indirect effects would be similar to those described above for vegetation treatments, plus the introduction of ash which could clog fish gills and pollute breeding or feeding habitat.

Brady Pincushion Cactus, Holmgren Milk-vetch, Jones' Cycladenia, and Siler Pincushion Cactus (Arizona Strip FO only): Impacts to these listed plant species from implementation of vegetation management decisions are considered negligible. No vegetation treatments would be undertaken in areas where these species occur. Few if any vegetative products would be available in these areas for sale. Fuels in the habitat of these species are sufficiently light that the probability of fire is extremely low.

Impacts from Soil, Water and Air Resources

Generally, watershed restoration projects would not be proposed within special status species habitats unless the project was considered essential for providing long-term benefits to one or more special status species. However, Alternative A does not include prohibitions on such actions in special status species habitats.

Impacts associated with vegetation treatments and restoration projects would be similar to those described in the Impacts to Vegetation from Vegetation and Fire and Fuels Management section above.

Construction of dams, dikes, and other water retention structures would have short-term impacts on vegetation resources similar to those described for vegetation treatments. The area of

disturbance would vary by the action proposed, but generally would average less than five acres per structure.

Desert Tortoise (Parashant and Arizona Strip FO only): No watershed restoration or other treatment projects are specifically proposed within desert tortoise habitat under this alternative, though such projects could be authorized where the project benefits or improves tortoise management. Most methods for treating Mojave Desert habitats would have little or no positive effects on desert tortoise habitat management and would likely increase the spread of invasive exotics such as cheat grass. As a result, it is unlikely that any such projects would be proposed over the life of this plan. Reclamation would be required for any such project authorized within the Pakoon DWMA/ACEC resulting in loss or degradation of tortoise habitat. Habitat would be restored or reclaimed as close to pre-disturbance conditions as practicable and would include planting or seeding of only native vegetation.

Minor to moderate direct effects to desert tortoise could result from watershed restoration or vegetation treatment projects where individual tortoise or eggs are injured or killed by being crushed by equipment used. Vehicles associated with surface disturbing actions have the potential to run over tortoise or their burrows. Ground disturbance would also encourage use of the area by predators, as would any trash or debris left on site from construction activities. Depending upon the methods for treatment, seeding, and/or reclamation, and the availability of post-treatment precipitation, indirect adverse effects would occur from loss of tortoise forage plants, shelter sites and other forms of thermal cover, and an increase in ambient temperatures increase. Long-term changes in vegetation could adversely affect tortoise where treatment objectives are not met and/or where invasive exotics out-compete native plant species. Some individual tortoises may be displaced from the treatment site due to loss of necessary habitat components.

Mexican Spotted Owl: Watershed restoration treatment projects are proposed in the vicinity of Mt. Trumbull, including the Death Valley and Lang's Run areas. Habitat in these areas is primarily ponderosa pine and pinyon-juniper communities. Mexican spotted owls in the Colorado Plateau region have shown a preference for cool, shady canyons and mixed conifer habitats for nesting. There are no mixed conifer stands within the Planning Area. Surveys for Mexican spotted owls have been conducted in proposed treatment areas and no suitable nesting habitat for the species was identified. Therefore, vegetation treatment projects would not occur in suitable nesting habitat for Mexican spotted owls. However, while nesting habitat for this species is rare or non-existent, wintering habitat is abundant. There is potential for the species to be found virtually anywhere in the Planning Area during the winter.

In the unlikely event that an undetected owl was present (roosting, foraging, dispersing, or wintering) during vegetation management activities, adverse effects would occur from disturbance by the noise and dust associated with treatment. Depending upon the proximity, the owl could be temporarily or permanently flushed from the site. Owls could also be disturbed by use of aircraft, potentially leading to collisions and mortality of the individual.

Bald Eagle: Bald eagles do not nest within the Planning Area, but they may range widely over the Planning Area during the winter months. Observations of bald eagles on the Planning Area are extremely rare. No bald eagle sightings have been recorded within 10 miles of the watershed restoration treatment projects proposed for the Death Valley and Lang's Run areas in Parashant. No watershed restoration or other treatment projects are specifically proposed within potential bald eagle habitat under this alternative in the Arizona Strip FO, though such projects could be authorized where the project benefits or improves management of the species.

Adverse effects could occur where eagles would be disturbed from roosting or foraging by the noise and dust associated with surface disturbing actions. Where aircraft are used in conjunction with the project, such as with aerial seedings, there is potential for eagles to collide with aircraft or be disturbed from roosting or foraging. Collisions would likely lead to mortality of the individual.

Because of their great mobility, the infrequency of observations, and lack of concentrated food sources with suitable roosting sites nearby, the potential for effects from watershed restoration and treatment actions is considered negligible.

California Condor: Based on radio-telemetry data, California condors probably range widely across the Planning Area, and may be observed throughout the year. Condors have been known to exhibit "curiosity" for human activities, and may be attracted to areas of disturbance. Condors have not been observed within 10 miles of the area of the proposed watershed restoration treatment projects in the Death Valley and Lang's Run areas. Habitat in these areas is primarily ponderosa pine and pinyon-juniper communities. Condors roost on ledges along cliff faces and generally forage in open habitats. The proposed treatment areas have been surveyed and do not include any suitable nesting habitat and little foraging habitat for this species.

In the unlikely event that a condor entered the area of active watershed restoration activities, adverse effects could occur. Condors would be disturbed from roosting or foraging by the noise and dust associated with surface disturbing actions. Garbage and debris left at the site could be ingested by the birds, leading to reduced fitness, illness, or death. Condors could also be disturbed by use of aircraft, potentially leading to collisions and mortality of the individual.

In Parashant, because of their great mobility, the infrequency of observations, and paucity of suitable foraging areas or roosting sites, the potential for effects from watershed restoration and treatment actions is considered negligible.

In Vermilion, because of their great mobility, the frequency of observations, and presence of suitable foraging areas or roosting sites, the potential for effects from watershed restoration and treatment actions is considered moderate.

In Arizona Strip FO, Implementation of Air, Water, and Soil resource decisions would lead to mostly negligible to minor effects to condors. However, because condors may at some point nest within the Arizona Strip FO, disturbance at a nest site is a small, but not discountable, possibility.

Southwestern Willow Flycatcher and Yuma Clapper Rail (Arizona Strip FO only): While no specific watershed restoration or other treatment projects are specifically proposed within riparian habitat for these species, such projects could be authorized where the project benefits or improves management of the species. Such projects could include restoration of tamarisk dominated sites to cottonwood-willow gallery forests or other riparian communities.

Woundfin Minnow and Virgin River Chub (Arizona Strip FO only): While no specific watershed restoration or other treatment projects are specifically proposed within habitat for these species, such projects could be authorized where the project benefits or improves management of the species.

Brady Pincushion Cactus, Holmgren Milk-vetch, Jones' Cycladenia, and Siler Pincushion Cactus (Arizona Strip FO only): No watershed restoration or other treatment projects are specifically proposed within special status plant habitats under this alternative, though such projects could be authorized where the project benefits or improves management of the species.

Impacts from Fish and Wildlife

Effects to Special Status Species: Impacts to special status species may result from initial or supplemental transplants of big game species, restoration and other vegetation treatment projects, and construction and maintenance of artificial water sources, and use of aircraft in wildlife management activities.

Desert Tortoise (Parashant and Arizona Strip FO): No big game transplants are planned within desert tortoise habitat. Supplemental releases of desert bighorn sheep could occur in the future, but these would be located at higher elevations above where tortoise would normally occur. Indirect impacts could result if vehicles used to transport big game animals for release introduce noxious weeds, thereby reducing habitat quality. Under this alternative, washing vehicles brought in from other areas is not a mandatory requirement.

There are no wildlife water developments within desert tortoise habitat in the Monument and no new artificial water sources are proposed.

Mexican Spotted Owl: Construction and maintenance of wildlife water development projects may result in negligible effects to Mexican spotted owl from use of aircraft. Construction activities at more remote sites occasionally require use of a helicopter to ferry supplies, materials, and/or work crews to the site. In addition, the Arizona Game and Fish Department (AGFD) conducts annual or biennial aerial surveys to count pronghorn antelope and bighorn sheep.

Most surveys are conducted from fixed-wing aircraft, though helicopters are occasionally used. With implementation of conservation measures and the ability of special status raptors to avoid aircraft, the potential for collisions is still considered very low.

Bald Eagle: Initial and supplemental transplants of big game wildlife species may result in negligible long term benefits to bald eagles and California condor by providing additional potential food sources. Indirect impacts could result if vehicles used to transport big game animals for release introduce noxious weeds, thereby reducing habitat quality. Under this alternative, washing vehicles brought in from other areas is not a mandatory requirement.

Construction of wildlife water development projects may result in negligible to minor effects to bald eagle and California condor. Increased use of the area by wildlife species not previously present would lead to increased prey availability for predators and scavengers. This could result in beneficial effects for bald eagles and condors. As many as 20 new wildlife water developments would be built throughout the life of this plan. The average size of the disturbance area is less than two acres each.

California Condor: Impacts to condors from implementation of wildlife transplants and construction and maintenance of wildlife water developments are discussed above with bald eagles. In addition, construction projects may leave environmental contaminants, waste products, trash, or other debris that could be ingested by California condors. In addition to the conservation measures (Appendix 2.E) for California condor, all construction projects must comply with project stipulations that address cleanup of these materials. Stipulations include covering open waste ponds with netting or otherwise making them inaccessible to wildlife. Because of the site specific nature of these types of actions and the ability that condors have to move away from or otherwise avoid project activities, the potential for adverse effect is considered very low.

Southwestern Willow Flycatcher and Yuma Clapper Rail (Arizona Strip FO only): No wildlife transplants are specifically proposed within riparian habitat for these species, though such projects could be authorized. In particular, habitat areas for Southwestern willow flycatcher have been identified in the Virgin River Gorge, within the Beaver Dam Mountains desert bighorn sheep habitat area. Supplemental transplants of sheep to this area could occur in the future. In addition, bighorn could be captured in this area for release in other locations. Any such transplants would be conducted outside of the breeding season of Southwestern willow flycatchers and Yuma clapper rail.

Woundfin Minnow and Virgin River Chub (Arizona Strip FO only): As with Southwestern willow flycatcher or Yuma clapper rail, captures and supplemental releases of desert bighorn sheep could be authorized within the Virgin River Gorge at some time in the future. Because desert bighorn walk in the river, there is a small possibility that sheep could step on eggs or young of native fish, leading to injury or mortality. However, the likelihood of this occurrence is considered so low as to be discountable.

Brady Pincushion Cactus, Holmgren Milk-vetch, Jones' Cycladenia, and Siler Pincushion Cactus (Arizona Strip FO only): Supplemental releases of desert bighorn sheep could occur within the habitat of Brady pincushion cactus. Similarly, releases of pronghorn antelope could occur in habitat of Siler pincushion cactus. There is a small possibility that these animals could step on and injure or kill listed plant species in these areas. However, the likelihood of this occurrence is considered so low as to be discountable.

Impacts from Special Status Species

Desert Tortoise (Parashant and Arizona Strip FO): In Parashant, designation of the Pakoon ACEC provides enhanced management capabilities for desert tortoise minimizing effects from other resource management programs. Impacts from implementation of restrictions on authorized uses within listed species habitats are described under the resource program where the restrictions apply.

In the Arizona Strip FO, designation of the Beaver Dam Slope, Virgin Slope, and Virgin River Corridor ACECs provides enhanced management capabilities for desert tortoise, minimizing impacts from other resource management programs. Impacts from implementation of restrictions on authorized uses within listed species habitats are described under the resource program where the restrictions apply.

Southwestern Willow Flycatcher and Yuma Clapper Rail (Arizona Strip FO only): Designation of the Virgin River Corridor ACEC provides enhanced management capabilities for these species minimizing impacts from other resource management programs. Impacts from implementation of restrictions on authorized uses within listed species habitats are described under the resource program where the restrictions apply.

Woundfin Minnow and Virgin River Chub (Arizona Strip FO only): Designation of the Virgin River Corridor ACEC provides enhanced management capabilities for these species minimizing impacts from other resource management programs. Impacts from implementation of restrictions on authorized uses within listed species habitats are described under the resource program where the restrictions apply. In addition, Alternative A includes a decision to evaluate and protect instream flows for Virgin River fishes. These actions have beneficial effects to Virgin River fishes by protecting existing flows.

Brady Pincushion Cactus and Siler Pincushion Cactus (Arizona Strip FO only): Designation of the Marble Canyon ACEC provides enhanced management capabilities for Brady pincushion cactus by minimizing impacts from other resource management programs. Similarly, the Johnson Spring, Lost Spring Mountain, Moonshine Ridge, and Fort Pearce ACECs provide enhanced management and protection for Siler pincushion cactus. Impacts from implementation of restrictions on authorized uses within listed species habitats are described under the resource program where the restrictions apply.

Impacts from Minerals (Arizona Strip FO only)

In the Arizona Strip FO, impacts to special status species from minerals management actions could result from locatable mineral development, oil and gas development, and/or mineral material sales/disposal. Impacts associated with these actions would include disturbance, injury, or mortality of individuals, particularly species with little or no mobility. Vehicles associated with mineral development activities could strike or run over listed species, or their breeding, feeding, or sheltering sites. Habitat could be degraded or otherwise modified, resulting in reduced fitness for the species. Chemicals used in mineral extraction may pose a hazard to listed species in the area. Such operations may also increase trash and debris at the site, encouraging predators of listed species.

Desert Tortoise (Arizona Strip FO only): Under Alternative A, desert tortoise ACECs would be available for fluid mineral leasing from October 15 to March 15, subject to a waivable no surface occupancy stipulation. Leasing of minerals is unlikely to occur in the ACECs as no economic occurrences of oil and gas resources have been found. However, the Arizona Strip has been only lightly explored for these resources. Potential for development of any geothermal resources in the area are low. Restricting surface-disturbing activities to the inactive season for tortoises would reduce the probability of some forms of take, such as tortoises being struck by vehicles on roads, but animals could still be killed or injured in their burrows and habitat could still be disturbed by mineral extraction.

Saleable minerals, in the form of sand and gravel are abundant along the lower Virgin and Beaver Dam slopes. Most of the Virgin and Beaver Dam Slopes and areas along Beaver Dam Wash are recognized as having high potential for sand and gravel. While desert tortoise ACECs would be closed to mineral material sales, such actions could still be authorized in desert tortoise habitat outside of the ACECs. Direct effects include disturbance, injury or mortality where tortoise are run over or crushed in their burrows, loss of habitat, increased risk of ingestion of foreign objects and toxic substances, and an increase in tortoise predators.

No locatable mineral mines are present in the ACECs and only one exploration site is known on the Beaver Dam Slope. However, the Beaver Dam Mountains outside the ACECs have moderate potential for placer gold and moderate to high potential for disseminated gold and breccia pipe minerals. BLM requires a plan of operations, mitigation, reclamation, and bonding for these types of mineral developments. While mining activity has been very low in the past, there is reason to suspect increased demand for these resources in the future.

California Condor (Arizona Strip FO only): Because of their tendency toward apparent curiosity, condors may be attracted to mineral extraction sites and may ingest debris or toxic substances that could lead to adverse effects to the species. Negligible effects could occur to these species in the form of noise, dust, and disturbance resulting from the equipment used for construction and maintenance of projects. These effects would be short-term. Trash, debris and waste materials left on site could be consumed by these birds, though project stipulations require that such trash be gathered and removed from the site.

Southwestern Willow Flycatcher and Yuma Clapper Rail (Arizona Strip FO only): As noted above for desert tortoise, the sale of sand and gravel materials within the Virgin River Corridor ACEC would not be authorized. In addition, habitat for these riparian bird species within the Virgin River Gorge is also included within the Beaver Dam Mountains Wilderness Area, further limiting mineral exploration activities. However, oil and gas leasing and locatable mineral extraction could still occur outside of the Gorge within the Virgin River Corridor ACEC.

Woundfin Minnow and Virgin River Chub (Arizona Strip FO only): Effects to Virgin River fishes from implementation of minerals management actions would be similar in scope and extent to those described above for riparian birds.

Brady Pincushion Cactus, Holmgren Milk-vetch, Jones' Cycladenia, and Siler Pincushion Cactus (Arizona Strip FO only): Implementation of minerals management actions in special status plant habitats could lead to similar effects to those described above for other listed species. The Marble Canyon and Fort Pearce ACECs do not include prohibitions on sales of mineral materials as does the desert tortoise ACECs.

Impacts from Livestock Grazing

Effects to Special Status Species: Impacts to special status species could result from livestock stepping on special status animals or plants. Trampling is generally considered a negligible effect for sensitive animal species because of the mobility of the animals, though desert tortoises are an exception. Effects of trampling are minor to moderate for sensitive plant species. Livestock herbivory of sensitive plant species would result in minor to moderate effects, though none of the sensitive plants within the Monument are considered suitable livestock forage.

Desert Tortoise (Parashant and Arizona Strip FO): The effects of livestock grazing on desert tortoise include habitat loss and degradation, and mortality or injury of tortoises resulting from operation, construction, and maintenance of range developments; habitat loss and degradation and associated mortality of tortoises resulting from livestock grazing; and mortality or injury of tortoises resulting from trampling.

No new range improvement projects are currently proposed in desert tortoise habitat; however, new projects could be proposed in the future. Construction and maintenance of range developments could result in minor disturbance of habitat. During construction, maintenance, and inspections of range improvements, some mortality or injury of desert tortoises could result through collisions with vehicles or other equipment. Increased access to new or existing range developments could lead to mortality of desert tortoises through collection, vandalism, crushing by vehicles, and shooting. Construction of range projects would have similar impacts to those described above for construction of artificial water sources.

Grazing practices can change vegetation composition and abundance, and cause soil erosion and compaction, reduced water infiltration rates, and increased runoff (Belsky and Blumenthal 1997, Warren 1996), leaving less water available for plant production. Livestock grazing can dramatically affect water infiltration rates by reducing vegetation cover and by compacting the soil.

Livestock grazing during the spring months reduces the quantity of available forage for desert tortoise (Berry 1978, Karl 1981, Coombs 1979). Both cattle and desert tortoises consume annual plants in the spring if precipitation has been sufficient for annual production (Esque 1994). At other times, cattle consume primarily shrub species, such as bursage, ratany, and galleta grass. Outside of the spring months or in years when green annual plants are not available, a greater percentage of cactus, shrubs, and dried grasses and annuals are consumed by desert tortoises (Nagy and Medica 1986; Hohman and Ohmart 1980).

Tortoises expand their home ranges and reproduction is reduced or eliminated when forage availability is very low (Tracy et al. 1994). Forage consumption by cattle exacerbates the effects of low forage availability on desert tortoise reproduction and home range size. Livestock grazing in years with poor rainfall and forage production may result in a reduction in recruitment of young tortoises into the population due to direct competition (Brussard 1994).

Cattle are known to trample tortoises and their burrows, but the frequency of trampling, or how this effects tortoise populations, is unclear. Shrubs and shelter sites constructed in the loose, sandy soil that accumulates around the base of shrubs provide important thermal cover for desert tortoises (Woodbury and Hardy 1948). Livestock can reduce the effectiveness of this cover through grazing and trampling (Nicholson and Humphreys 1981).

Livestock grazing during years of abundant annual plant growth could help reduce the risk of wildfire in desert tortoise habitat. However, livestock have facilitated the spread and introduction of nonnative plants, which in turn fuel fires that destroy or severely degrade habitat and can result in direct mortality or injury of tortoises; however, removing cattle may not affect a return to native plant communities. Changes in vegetation communities induced by grazing may alter the quantity or nutritional value of forage available to tortoises, possibly contributing to malnutrition and elevated risk of contracting or becoming symptomatic for upper respiratory tract disease (URTD).

Closing areas to grazing could lead to a reduction or cessation of maintenance, abandonment, and/or removal of livestock waters. Vegetation in these areas may or may not regenerate, depending upon the timing and duration of grazing, the extent of long term changes in species composition, localized erosion, and the extent of soil compaction.

Managing allotments as forage reserves would have similar impacts to those described above for livestock grazing, except that grazing would occur less frequently. Livestock and permittees would be less familiar with the location of waters, forage areas, and other developments,

resulting in more widespread, but less intensive impacts. Restoration, vegetation treatments, and water development maintenance would be performed more frequently on forage reserve allotments.

Impacts to desert tortoise from authorizing livestock grazing vary from minor to moderate and include both short- and long-term effects. The magnitude of these impacts would be greater for Alternative A than for any other alternative since more area is available for livestock grazing. These effects are not anticipated to be population level or recovery-unit-wide effects, despite the isolation of the Pakoon DWMA/ACEC from other desert tortoise populations.

Mexican Spotted Owl, Bald Eagle, California Condor: Impacts to special status raptors could occur from construction and maintenance of range improvement projects. Negligible impacts could occur to these species in the form of noise, dust, and disturbance resulting from the equipment used for construction and maintenance of projects. These effects would be short-term. Trash, debris and waste materials left on site could be consumed by these birds, though project stipulations require that such trash be gathered and removed from the site.

Welsh's Milkweed (Vermilion only): Impacts to this threatened plant species could occur from trampling by livestock and from construction and maintenance of range improvement projects within its habitat. Minor effects could occur to the species in the form of injury or mortality where vehicles or equipment used for construction and maintenance of projects runs over and crushes the plant. However, it is unlikely that such actions would be authorized where there was a possibility that the species could be impacted. Trampling by livestock is considered an extremely rare occurrence.

Southwestern Willow Flycatcher (Arizona Strip FO only): Livestock grazing has been identified as a significant contributor to the decline of the southwestern willow flycatcher (Sogge et al 1996). Direct effects include jostling of nests and other physical disturbances in the nesting areas. Grazing by livestock removes new shoots of native vegetation that could develop into suitable nesting habitat for Southwestern willow flycatchers. Indirect effects include attracting nest parasites such as brown-headed cowbirds, slowing regeneration of habitat areas, and reduction of water quantity and quality. Grazing in adjacent upland areas may lead to an increase in erosion, sedimentation, and salinity in the riparian habitats. Areas where seasonal grazing restrictions have been put into effect have not been adequately studied to determine the significance of non-growing season grazing practices. The magnitude of these impacts would be greater for Alternative A than for any other alternative since more area is available for livestock grazing.

Woundfin Minnow and Virgin River Chub (Arizona Strip FO only): Effects to Virgin River fishes from implementation of livestock grazing management actions would be similar to those described above for Southwestern willow flycatcher. Direct effects include livestock stepping on fish eggs or fry, resulting in injury or mortality. Grazing by livestock removes cover plants that shade watering areas and keep temperatures within acceptable range for fish. Continued use by

livestock leads to degradation and collapse of banks and loss of vegetation. Livestock wastes foul water sources and change the local water quality conditions. Effects on fish food supplies have not been well studied. Grazing in adjacent upland areas may lead to an increase in erosion, sedimentation, and salinity in the riparian habitats. The magnitude of these impacts would be greater for Alternative A than for any other alternative since more area is available for livestock grazing.

Brady Pincushion Cactus, Holmgren Milk-vetch, Jones' Cycladenia, and Siler Pincushion Cactus (Arizona Strip FO only): Livestock grazing may lead to long-term changes in soil and vegetation community dynamics, leading to unfavorable changes for rare plant species.

However, research in this area has been inconclusive. Herbivory on special status plant species by livestock does not appear to be a problem. Injury or mortality of special status plants due to trampling by livestock has been infrequently documented in Brady and Siler pincushion cactus habitats. While the occurrence of injury or mortality from trampling is uncommon, typically less than three percent of plots, it exceeds the level of a discountable effect. The magnitude of these impacts would be greater for Alternative A than for any other alternative since more area is available for livestock grazing.

Impacts from Recreation

A wide variety of recreational activities occur all across the Arizona Strip. Commercial activities and organized non-commercial events of more than 50 participants would generally be authorized with a special recreation permit (SRP). Permits of this type typically allow for vehicular events such as motorcycle races or OHV or horseback tours, guided hiking or hunting trips, research oriented field schools, or orienteering events such as geo-caching.

Effects to Special Status Species: Impacts to special status species from maintenance or restoration of natural remote settings would vary depending upon ecological zone and the method used to conduct the restoration. Impacts would be the same as those described for vegetation treatments under Impacts from Air, Water, and Soil Resources and Impacts from Vegetation and Fire and Fuels Management.

Foot traffic through sensitive areas could trample, injure, or kill special status plants. Camping increases the likelihood of such effects. Collection of dead and down wood for firewood would increase the extent and severity of impacts to vegetation. Use restrictions on these types of activities help reduce or eliminate adverse impacts to special status plants.

Desert Tortoise (Parashant and Arizona Strip FO): Desert tortoise could be disturbed, injured, or killed as a result of the operation of motorized vehicles within their habitat. Authorized actions such as commercial recreation or competitive events increase the probability of death or injury of these animals resulting from collisions. Under this alternative, all competitive vehicular speed events would be prohibited in the Pakoon DWMA/ACEC, organized non-speed events would be limited to designated routes and would only be authorized between

October 15 and March 15. Non-commercial vehicular events of less than 50 vehicles are non-discretionary actions. Minor to moderate adverse effects could result from vehicles colliding with desert tortoise from any of these events. The probability of collisions would be reduced dramatically where vehicle use is limited to the inactive season for desert tortoise.

Limiting vehicle camping to within 50 feet of designated routes would strictly limit off-highway driving and prevent creation of new routes that otherwise might occur by recreationists accessing camping sites. Campers in the Pakoon DWMA/ACEC are not commonly encountered, except perhaps during hunting season. Some tortoise mortality and crushing of burrows could occur as a result of vehicles pulling off the road for camping, horseback riding, mountain biking, or other recreational pursuits.

Impacts to desert tortoise from authorizing recreational activities vary from minor to moderate and could be both short- and long-term.

Mexican Spotted Owl, Bald Eagle, California Condor: Bird watching, big game hunting, and wildlife viewing are not BLM-authorized actions, though they are promoted in the RMP. Bird-watchers are drawn from across the country to catch a glimpse of a rare species, such as California condor. However, the probability of recreational activities of this nature leading to contact between humans and special status raptors is low everywhere except in the immediate vicinity of condor release site at the Vermilion Cliffs, within high density recreation areas such as Paria Canyon, and in the immediate vicinity of condor nesting, roosting, or foraging areas outside of the Planning Area. The combination of high mobility and the implementation of conservation measures greatly reduce the probability and severity of direct impacts to these species resulting from disturbance associated with recreational activities. The effects of hunting are not analyzed here because the authority for authorizing hunting permits lies with the State of AGFD.

Southwestern Willow Flycatcher and Yuma Clapper Rail (Arizona Strip FO only):

Recreational activities at the Beaver Dam Confluence area could lead to disturbance of willow flycatcher or clapper rail nesting sites by humans. The probability of nest abandonment from such activities is probably low, but not discountable. In addition, trash and debris at the site could increase the presence of nest parasites of willow flycatchers, such as brown-headed cowbirds.

Woundfin Minnow and Virgin River Chub (Arizona Strip FO only): Recreational activities along the Virgin River could lead to disturbance of native fishes from breeding and/or foraging areas. The likelihood of this occurring is considered discountable.

Brady Pincushion Cactus, Holmgren Milk-vetch, Jones' Cycladenia, and Siler Pincushion Cactus (Arizona Strip FO only): Foot traffic through sensitive areas could trample, injure, or kill special status plants. Camping increases the likelihood of such effects. Collection of dead and down wood for firewood would increase the extent and severity of impacts to vegetation.

Use restrictions on these types of activities help reduce or eliminate effects to special status plants. Because the likelihood for these events to occur in special status plant habitats is very low, the potential for these impacts is considered discountable.

Impacts from Lands and Realty Management

Effects to Special Status Species: In the Monuments, impacts to special status species could result from issuance of ROWs necessary for access and/or maintenance needs to private or state in holdings, ROWs within the boundaries of existing ROWs or designated corridors, and where site-specific NEPA analysis determines that impacts to Monument objects or values would be negligible.

In the Arizona Strip FO, impacts to special status species could result from land tenure adjustments such as acquisition or disposal and issuance of ROWs. This alternative includes land exchanges or sales of up to 1,162 acres of BLM lands in the Virgin River corridor. Because none of the land exchanges involve riparian habitat, there would be no direct loss of riparian habitat, however there would be interrelated effects on adjacent riparian areas.

Desert Tortoise (Parashant and Arizona Strip FO): Impacts from issuance of ROWs would vary upon the nature and purpose of the ROWs. Impacts in Parashant would be minor as any new ROWs or associated actions that had more than a negligible impact on Monument objects or values would not be authorized. Impacts in the Arizona Strip FO would be minor to moderate depending upon the nature of the action. New ROWs could increase vehicle traffic along existing routes, resulting in increased potential for injury or death of desert tortoise.

Southwestern Willow Flycatcher, Yuma Clapper Rail, Woundfin Minnow, and Virgin River Chub (Arizona Strip FO only): Removal of lands from federal ownership could have long term effects on urban development along the Interstate 15 corridor. An increase in urban development along the Interstate 15 corridor could lead to a decrease in water quantity and quality. An increase in the demand for water due to a larger human population could result in a lowered water table and possibly reduced flows in the river and associated riparian. However, hydrologic studies indicate that local groundwater aquifers are well below river level and may have little effect on flows in the river (Las Vegas Valley Water District 1992). Despite this, development of lands adjacent to riparian areas along the river could lead to a reduction in the size and quality of riparian habitat. Direct effects to these species include loss of available habitat for breeding, feeding, or sheltering activities, and injury or mortality as land is developed. An increase in development would likely result in an increase in the number of people using riparian areas, increasing the chances of fire, OVH use, and predation by pets and nest parasites. In addition, trash and debris would likely increase at riparian sites.

Alternative B**Impacts from Trails and Travel Management**

Impacts to special status species would be the same as those described under Alternative A; however, due to the increase in number of miles of roads closed or open for administrative use only, impacts would occur over a smaller area than under any other alternative.

Impacts from Vegetation and Fire and Fuels Management

Impacts to special status species would be similar to those described under Alternative A, with the following exceptions and additions:

Using DFCs and DPC objectives to make decisions would enhance protection of sensitive resources and benefit uses by emphasizing consideration of those uses in planning. Employing seasonal restrictions on uses would also benefit special status species. Identifying ecological zones with unique DFCs, DPCs, and vegetation management actions would increase management capabilities.

Desert Tortoise: Under Alternative B, no planned vegetation treatment projects would be authorized in the Mohave Desert or Mohave-Great Basin Transition Ecological Zones. Within desert tortoise habitat, fire use would not be appropriate and would not be authorized.

The Pakoon DWMA/ACEC would be closed to the collection of vegetative products. Use and/or sale of vegetation products outside the DWMA/ACEC would have localized, negligible to minor impacts on desert tortoise.

Impacts from implementation of noxious weed management actions would be similar to those described under Alternative A, except that vegetative treatments would not be authorized in tortoise habitat. This would limit the ability to do noxious weed treatments. Effects of these actions on desert tortoise are expected to be negligible to minor. Desert tortoise should benefit from reduction or elimination of noxious weeds.

Southwestern Willow Flycatcher and Yuma Clapper Rail (Arizona Strip FO only): Under this alternative, the sale of vegetation products in the Virgin River Corridor ACEC would not be authorized. However, there is no prohibition against such actions within the riparian zone at Kanab Creek. In addition, impacts could result from collection of firewood for personal use. Direct, negligible to minor impacts could result if nests are disturbed during collection of wood. This is not considered a likely occurrence. Generally, little if any fuelwood is available in habitat areas for these species. However, collection of firewood could reasonably be expected for building campfires. Campfires increase the probability of fire escaping and burning through the habitat area. Impacts from fire use and suppression are described below.

Impacts from Soil, Water and Air Resources

Impacts to special status species in Parashant and Vermilion would be similar in nature and scope to those described under Alternative A. Impacts in the Arizona Strip FO would also be similar to those described under Alternative A, with the following exceptions/additions:

Desert Tortoise (Arizona Strip FO only): In the Arizona Strip FO, no watershed restoration or treatment projects would be authorized in the Mojave Ecological Zone, resulting in no impacts

Southwestern Willow Flycatcher, Yuma Clapper Rail, Woundfin Minnow and Virgin River Chub (Arizona Strip FO only): Under Alternative B, no watershed restoration and treatment projects would be authorized in the Riparian Ecological Zone, resulting in no impacts.

Impacts from Fish and Wildlife

Impacts to special status species from wildlife management actions would be similar to those described under Alternative A, with the following exceptions and additions:

Providing access to public lands for the hunting and wildlife viewing would maintain routes through the habitat. Impacts to special status species from implementation of a transportation system would be the same as those described under Alternative A, Impacts from Transportation and Access.

Identification of priority wildlife species would benefit these species by increasing consideration for these animals in project design and implementation.

Impacts from Special Status Species

Impacts to special status species would be similar in scope and extent to those described under Alternative A, with the following exceptions/additions.

Desert Tortoise: De-designation of the Pakoon ACEC in Parashant would have a negligible effect on desert tortoise as management within the area would continue unchanged. The name would be changed to the Pakoon DWMA and the boundaries would remain the same as the former Pakoon ACEC. Management actions would be the same as for Alternative A and would thus have the same impacts.

Relict Leopard Frog (Parashant only): Introducing relict leopard frogs at Pakoon Springs or other locations within Parashant would have short-term minor to moderate effects on special status bird species using the area (American bittern, white-faced ibis, and possibly yellow-billed cuckoo), depending upon the methods used during site preparation. Ponds at Pakoon Springs would require complete removal of water, vegetation, and soil sterilization to remove bull frogs and other undesirable exotic species.

Brady Pincushion Cactus, Siler Pincushion Cactus, Jone's Cycladenia, Holmgren Milk-vetch, Fickeisen Plains Cactus, Gierisch Mallow, and Paradine Plains Cactus (Arizona Strip FO only): Designation of the Marble Canyon, Johnson Spring, Lost Spring Mountain, Moonshine Ridge, Fort Pearce, Lone Butte, Black Knolls, Twist Hills, Clayhole, Buckskin, and Coyote Valley ACECs would be wholly beneficial for these listed plant species.

Impacts from Minerals (Arizona Strip FO only)

Impacts to special status species would be similar to those described under Alternative A.

Impacts from Livestock Grazing

Impacts to special status species from livestock grazing and related actions would occur over a smaller area than under other alternatives, since fewer areas would be available for grazing. The types of impacts would be the same as those described under Alternative A, with the following exceptions/additions.

Desert Tortoise (Parashant and Arizona Strip FO): Closure of all desert tortoise critical habitat within Parashant to grazing would reduce the level of impact and potential for adverse modification to critical habitat. Remaining areas of critical habitat within the Monument have been burned and converted to annual grass communities. As such, these areas no longer possess the primary constituent elements of critical habitat and were therefore excluded from consideration for grazing closure. The majority of the remaining areas of critical habitat within the Monument Habitat that was previously impacted by livestock grazing would begin to regenerate. Once cattle are removed, no additional injury or mortality would be expected from trampling or crushing of individual tortoise or eggs.

Impacts from Recreation

Impacts would be similar in scope and magnitude as those described under Alternative A.

Impacts from Lands and Realty

Impacts to special status species would be the same as those described under Alternative A for Parashant and Vermilion. In the Arizona Strip FO, the following would apply:

Effects to Special Status Species: Impacts to special status species in the Arizona Strip FO could result from land tenure adjustments such as acquisition or disposal and issuance of ROWs. The magnitude of these impacts would be less for this alternative than for any other since fewer acres would be available for disposal.

Alternative C

Impacts from Trails and Travel Management

Impacts to special status species would be similar to those described under Alternative A. However, due to the reduced number of roads open for public use under this alternative, the magnitude of impacts would be less than that of Alternative A, but greater than for Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Impacts from vegetation treatments in all ecological zones could occur on more acres than under Alternative B, but less than all other alternatives.

Impacts from Soil, Water and Air Resources

Impacts to special status species would be similar in scope and extent to those described under Alternative A. The magnitude of these impacts would be greater than for Alternative B, but less than that of other alternatives.

Impacts from Fish and Wildlife

Impacts to special status species would be similar in scope and extent to those described under Alternative A. The addition of new Watchable Wildlife areas in this alternative would increase visitation in sensitive habitats, thus increasing impacts.

Impacts from Special Status Species

In Parashant, impacts to special status species would be similar in scope and extent to those described under Alternative B. In Vermilion and the Arizona Strip FO, impacts would be similar to those described under Alternative A. The following exceptions/additions also apply:

Relict Leopard Frogs (Parashant only): Introduction of relict leopard frogs or other special status species at Pakoon Springs and/or Tassi Springs and Ranch would likely require extensive cattail and bullfrog eradication efforts. Permanently converting this habitat to a flowing water system could reduce or eliminate the habitat needs of other special status species, such as Yuma clapper rail, and preclude efforts to introduce such other species.

Desert Tortoise (Parashant and Arizona Strip FO): Augmenting existing burrowing owl populations and installing artificial nest burrows in the Pakoon Basin (Parashant) would have minor to moderate long-term direct impacts to local tortoise populations. Burrowing owls would likely prey upon young tortoise, leading to direct mortality and population declines for the species.

Jone's Cycladenia, Holmgren Milk-vetch, Fickeisen Plains Cactus, Gierisch Mallow, and Paradine Plains Cactus (Arizona Strip FO only): Failure to designate the Lone Butte, Black Knolls, Twist Hills, Clayhole, Buckskin, and Coyote Valley ACECs would be not afford these species the same protections available within an ACEC.

Impacts from Livestock Grazing

Impacts would be similar in nature and scope to those described under Alternative A. The magnitude of adverse effects would be greater than for Alternative B, but less than for other alternatives.

Impacts from Minerals (Arizona Strip FO only)

Impacts to special status species would be similar to those described under Alternative A.

Impacts from Recreation

Impacts would be similar in nature and scope to those described under Alternative A.

Impacts from Lands and Realty

Impacts to special status species would be similar in nature and scope to those described under Alternative A for Parashant and Vermilion. The following additions/modifications apply to the Arizona Strip FO:

Effects to Special Status Species (Arizona Strip FO only): Impacts to special status species could result from land tenure adjustments such as acquisition or disposal and issuance of ROWs. The magnitude of these impacts would be greater than Alternatives A and B and the same as Alternatives D and E.

Alternative D

Impacts from Trails and Travel Management

Impacts would similar to those described under Alternative A. This alternative includes fewer miles of roads closed and more miles open than any other alternative except Alternative A. As a result, the magnitude of impacts would be greater than that of Alternatives B, C, and E, but less than Alternative A.

Impacts from Vegetation and Fire and Fuels Management

The magnitude of impacts from vegetation management would be greater than for Alternatives B, and C, equal to Alternative E, but less than that of Alternative A. Impacts from vegetation treatments in all ecological zones could occur on more acres than under any other alternative.

Impacts from Soil, Water and Air Resources

The magnitude of these impacts would be less than that of Alternative A, equal to that of Alternative E, and less than that of Alternatives B and C.

Impacts from Fish and Wildlife

Impacts to would be similar in scope and extent to those described under Alternative C.

Impacts from Special Status Species

Impacts would be similar in scope and extent to those described under Alternative B, with the following additions and/or exceptions:

Relict Leopard Frogs (Parashant only): Impacts would be similar in scope to Alternative C.

Desert Tortoise (Parashant and Arizona Strip FO): Impacts would be similar in scope to Alternative C.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be would be similar to those described under Alternative A.

Impacts from Livestock Grazing

The magnitude of impacts would be less than that of Alternative A, but greater than for other alternatives.

Impacts from Recreation

Impacts would be similar in nature and scope to those described under Alternative A.

Impacts from Lands and Realty

Impacts would be similar in nature and scope to those described under Alternative A for Parashant and Vermilion. The following apply to the Arizona Strip FO:

Effects to Special Status Species (Arizona Strip FO only): Impacts to special status species could result from land tenure adjustments such as acquisition or disposal and issuance of ROWs. The magnitude of these impacts would be greater than for Alternatives A and B but the same as Alternatives C and E.

Alternative E: Preferred

Impacts from Trails and Travel Management

Impacts would be similar to those described under Alternative A. Due to the increase in miles of road open for public use under this alternative, the magnitude of impacts would be greater than for Alternatives B, and C, but less than those for Alternatives A and D.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as under Alternative D.

Impacts from Soil, Water and Air Resources

Impacts would be the same as under Alternative D.

Impacts from Fish and Wildlife

Impacts to would be similar in scope and extent to those described under Alternative C.

Impacts from Special Status Species

Impacts would be similar in scope and extent to those described under Alternative A for Vermilion and the Arizona Strip FO. Impacts would be similar to those described under Alternative B for Parashant. The following additions and/or exceptions would also apply.

Relict Leopard Frogs (Parashant only): Impacts would be similar to Alternative C.

Desert Tortoise (Parashant and Arizona Strip FO): As under Alternatives A and B, burrowing owl populations would not be augmented in Parashant, eliminating the potential for adverse effects from this action.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be similar to those described under Alternative A.

Impacts from Livestock Grazing

The magnitude of impacts would be less than that of Alternatives A and D, but greater than for other alternatives.

Mexican Spotted Owl, Bald Eagle, California Condor: As with Alternative B, closing the River Pasture of the Lees Ferry Allotment to livestock grazing would further reduce potential for impacts to special status raptors that might use Paria Canyon.

Impacts from Recreation

Impacts would be similar in nature and scope to those described under Alternative A.

Impacts from Lands and Realty

Impacts would be similar in nature and scope to those described under Alternative A in Parashant and Vermilion. On the Arizona Strip FO, impacts would occur over a larger area than for Alternatives A and B but would be the same as Alternatives C and D.

Cumulative Impacts

The geographic area for analysis of cumulative impacts to special status species is the southwestern region of the United States. The distribution of several listed species extends well beyond the Planning Area boundary. For example, Siler pincushion cactus is also found in portions of southern Utah; desert tortoise range widely across the Mojave Desert; southwestern willow flycatcher, Yuma clapper rail, and yellow-billed cuckoo are found in riparian habitats throughout the southwest; and Mexican spotted owls may be found in canyon and mixed conifer forests throughout the region. Activities that occur virtually anywhere within the Virgin River watershed have the potential to affect woundfin minnow, Virgin chub, and other native fishes. Bald eagles are even more widely distributed, but the lack of consistent or significant use by this species in the Planning Area was grounds for limiting the area of consideration to the southwestern U.S.

Among the contributing factors in the decline of most or all of these species is the loss or fragmentation of available habitat. Because the Planning Areas is at the edge of several major physiographic regions, most of the listed species found here are at the edge of their range. Most of these species depend upon rare or unique habitats, such as southwestern willow flycatcher and Yuma clapper rail in riparian areas, woundfin minnow and Virgin chub in the Virgin River, and desert tortoise in the Mojave Desert. Most listed plant species have very narrow habitat requirements and are not able to grow or survive outside of these areas. Development pressure exists throughout the southwestern U.S., particularly in and adjacent to sources of water. As a result, community expansion has had adverse effects on special status species.

Community expansion has also led to increased pressure for water and developable lands. Land disposals have reduced available desert tortoise habitat by up to 400 acres since 1973. Issuance of ROWs has also reduced tortoise habitat by as much as 1,859 acres over the same time period. Acquisition of special status species habitat has increased protection of the species by shifting management emphasis toward conservation. Demand for water for industrial, irrigation, and culinary use has had major long-term effects on special status fish. Disruptions of flow regimes from dams and diversions have altered habitat for fish and riparian dependent species. Reductions in water quality have had similar long-term effects. Introduction of non-native plants and animals have resulted in adverse effects to listed species from competition for resources, trampling, predation, injury, and death. Tamarisk invasion in riparian areas has resulted in reductions of flow for native fishes, reductions in the overall size of the vegetative community, increased temperature and salinity, and increased risk of fire. However, the invasion of tamarisk has also increased available nesting habitat for southwestern willow flycatcher.

Wildfires have reduced available desert tortoise habitat by many thousands of acres through conversion of the vegetation from native communities to exotic annual grasses. Livestock grazing has increased the probability that listed species such as of endangered plants and desert tortoise could be trampled. During years of drought and/or low productivity, livestock grazing has reduced forage availability for desert tortoise. Some 128,005 acres of desert tortoise habitat were closed to livestock grazing since 1998. An additional 144,027 acres of desert tortoise habitat have seasonal grazing restrictions. Mineral development has led to reduction of habitat quality and physical disturbance in desert tortoise and endangered plant habitats.

Recreational pursuits, particularly OHV use, have caused disturbance to most all species and their habitats. With the increase in local populations has come a dramatic increase in the level of OHV use, resulting in increased disturbance, injury, and mortality to listed plants and ground dwelling species with low mobility. Transportation corridors exist through the habitat of virtually all listed species found within the Planning Area. Adverse effects vary by species and by the location, level of use, and speed of travel over the road. In some areas the habitat has been rendered unusable to listed species by long-term recreational use.

Implementation of plan decisions is expected to improve conditions for special status species by giving these species priority status, focusing management attention, and reducing or eliminating actions that lead to adverse effects. Among species currently listed, the status of desert tortoise, relict leopard frog, bald eagle, southwestern willow flycatcher, Yuma clapper rail, yellow-billed cuckoo, California condor, Mexican spotted owls, burrowing owls, Siler pincushion cactus, Jones' cycladenia, Welshs milk-weed, Brady pincushion cactus, and Holmgren milk-vetch should remain stable or improve.

Impacts from livestock grazing on desert tortoise would be minimized. Water use in the region would continue to increase, affecting flows in the Virgin River and continuing to cause a decline in populations of woundfin minnow and Virgin River chub. Efforts to remove or reduce tamarisk would increase in scope and size, leading to localized impacts but ultimately increasing

the size and quality of habitat for riparian dependent species such as southwestern willow flycatcher, Yuma clapper rail, and yellow-billed cuckoo. Reduction in tamarisk would also increase flows for Virgin River fishes. Increased demand for land for community services and recreational uses would occur, particularly in the area around Mesquite and Littlefield/Beaver Dam. Assuming land ownership follows the preferred alternative for this RMP, impacts would continue to increase at modest levels. The demand for new lands for development would likely lead to development of one or more Habitat Conservation Plans, providing compensation funds and other benefits to desert tortoise and riparian dependent birds. However, such plans also include compromises in the form of further habitat loss and fragmentation.

WILD BURROS

Impacts to Burros

Wild Burros have only been known to populate the area around Lower Grand Wash Cliffs, Grand Wash Bay, and Tassi Springs of Parashant, which includes BLM and NPS lands. To protect the Mojave population of the desert tortoise, the herd management levels was set at zero in the Arizona Strip RMP Mojave Desert Amendment (BLM 1998). The Lake Mead NRA Burro Management Plan (1995) established those areas populated with burros within the NRA as zero use. These decisions would be carried through under all the alternatives. As a result, any burros who enter the planning area would continue to be removed, as funding and resources allow.

CULTURAL RESOURCES

This section presents potential impacts of the alternatives on cultural resources, specifically archaeological, historic, and American Indian resources, as determined through changes in the resources or access to them. The locations of most cultural resource sites in the Planning Area are not known. See Chapter 3 for a discussion of cultural resources in the Planning Area.

The archaeological, historic, and/or traditional cultural property (TCP) settings contribute to a site's eligibility for placement on the NRHP. Such eligibility may be affected if such settings are altered, disturbed, or destroyed.

Archaeological and historical resources may be impacted by unauthorized collection and excavation, vandalism, erosion, trampling, OHV use off-road, fire, soil compaction, and mechanized surface disturbance. Indirect impacts may cause surface disturbance that allows subsequent soil erosion and undermining of sites and structures. Indirect impacts may also allow access or lack of access for vandalism.

American Indian Resources may be impacted by unauthorized collection, vandalism, erosion, trampling, OHV use off-road, fire, mechanized surface disturbance, and loss of access to sacred or traditional use areas.

Methods and Assumptions

To analyze the potential effects of the alternatives on archaeological and historic resources, information was gathered from inventories and excavations in and adjacent to the Planning Area; however, less than 5 percent of the Planning Area has been inventoried and only a handful of excavations have been conducted. The analysis is also based on professional expertise of BLM specialists at the Arizona Strip FO and the NPS staff at Lake Mead NRA and a review of the relevant scientific literature.

Resources, information was gathered through consultation with tribal governments and individual tribal members, the Cultural Landscape and Place Name Study (Stoffle et al. 2004; Austin and Dean 2004), and a review of relevant literature.

Effects are quantified where possible. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible. The following guidance was used to describe the intensity of impacts to archaeological and historic resources:

- Negligible:** The impact would not be detectable. The effect on archaeological or historic sites would be at the lowest levels of detection, barely measurable with any perceptible consequences, either beneficial or adverse, on archaeological or historic resources. For purposes of Section 106, the site's NRHP eligibility would not be threatened and the determination of effect would be *no effect*.
- Minor:** The impact would be detectable. The effect on archaeological or historic sites would be measurable or perceptible, but it would be slight and localized within a relatively small area for a site or group of sites. The action would not affect the character or diminish the features of a NRHP eligible or listed site and would not have a permanent effect on the integrity of any site. For the purposes of Section 106, the site's NRHP eligibility would remain intact and the determination of effect would be *no effect*.
- Moderate:** The impact would be readily apparent. The adverse impact would be measurable and perceptible. The action would change one or more character-defining features of an archaeological or historic resource, but it would not diminish the integrity of the resource to the extent that its NRHP eligibility would be jeopardized. For purposes of Section 106, the site's NRHP eligibility would not be threatened and the determination of effect would be *no adverse effect*.
- Major:** The impact would be severe. The adverse impact on archaeological or historic sites would be substantial, noticeable, and permanent. For NRHP eligible or listed archaeological sites, the action would change one or more character

defining features of the resource, diminishing the integrity of the resource to the extent that it would no longer be eligible for listing in the NRHP. For purposes of Section 106, the site's NRHP eligibility would be lost and the determination of effect would be *adverse effect*.

The following guidance was used to describe the intensity of impacts to American Indian resources:

- Negligible:** The impact on American Indian areas of concern and access would be at the lowest levels of detection, barely measurable with any perceptible consequences, either beneficial or adverse. For purposes of Section 106, the TCP's NRHP eligibility would not be threatened and the determination of effect would be *no effect*.
- Minor:** The impact on American Indian areas of concern and access would be measurable or perceptible, but it would be slight and localized in a relatively small area. The action would not affect the character or access to traditional use or sacred areas. It would not have a permanent effect on the integrity of any ethnographic resource or traditional use area. For purposes of Section 106, the TCP's NRHP eligibility would remain intact and the determination of effect would be *no effect*.
- Moderate:** The impact would be measurable and perceptible. The action would change one or more characteristics or defining features of the ethnographic resource or traditional use area, but it would not diminish the integrity of the resource to the extent that it would no longer qualify for the NRHP. Access to sacred or traditional use areas would be affected and could cause changes in traditional use patterns. For purposes of Section 106, the site's NRHP eligibility would be threatened and the determination of effect would be *no adverse effect*.
- Major:** The impact on American Indian resources would be substantial, noticeable, and permanent. The action would change or affect one or more character defining features of ethnographic resources or traditional use areas. It would diminish the integrity of the resource to the extent that it no longer would be able to sustain traditional or sacred uses. Or access to sacred or traditional use areas would no longer be possible. For Section 106 purposes, the TCP's NRHP eligibility would be lost and the determination of effect would be *adverse effect*.

The area of analysis for cumulative effects on archaeological and historic resources and American Indian resources was defined as northern Arizona, southwestern Utah, and southeastern Nevada.

The following assumptions are made for cultural resources;

1. All laws for the management and protection of cultural resources would be followed, to the extent allowed by budget and available personnel.
2. Section 106 inventories and mitigation would be conducted for all proposed projects, as required by NHPA, under each alternative.
3. Some proactive Section 110 inventory, research, stabilization, or preservation would be accomplished in the Planning Area each year.
4. NRHP listed and some NRHP eligible sites as well as the cultural resources in the ACECs would be monitored for vandalism and protected or stabilized, as necessary.
5. All surface disturbing activities include mitigation to reduce impacts to cultural resources. Analysis of impacts includes all mitigation.

Impacts to Archaeological and Historical Resources

Impacts to archaeological and historical resources in the Planning Area would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Wilderness Characteristics
- Vegetation and Fire and Fuels Management
- Visual
- Cultural Resources
- Minerals (Arizona Strip FO only)
- Livestock Grazing
- Recreation
- Special Area Designations (Arizona Strip FO only)
- Lands and Realty (Arizona Strip FO only)

Alternative A: No Action

Impacts from Trails and Travel Management

Archaeological and Historical Resources: Impacts to cultural resources primarily stem from management actions that restrict or increase access. Increased access to cultural sites could increase contact by visitors who could intentionally damage sites by collecting surface artifacts, vandalizing, illegally digging, or otherwise excavating the sites. Visitors can also unintentionally damage sites by camping or driving across sites. In fact, studies have shown that damage to sites is mainly concentrated within several hundred yards of roads (Sullivan et al. 2002). Reducing such access by closing roads or restricting travel could thus protect cultural resources. On the other hand, increased access can allow for the increased presence of law enforcement, cultural resource personnel, and site stewards for purposes of monitoring sites and areas. Increasing

access could also increase the amount of cultural resource inventories and research as it would decrease the cost of excavation, inventory, or recording. Finally, increased access would allow for the increased presence of the public which can also deter vandalism. This is suggested by recent ARPA cases on the Arizona Strip and in southern Utah showing that pothunters in the area tend to select isolated sites in order to excavate without getting caught. As a result, more and more pothunters in the area are using OHVs or 4-wheel drive vehicles to access and vandalize sites in roadless areas.

Under Alternative A, motor vehicles would be restricted to designated roads and no areas of the Monuments would be authorized for cross-country, off-road vehicle use, except for authorized administrative and emergency purposes. This would limit direct and indirect impacts associated with motorized vehicle use on or near sites. This alternative designates the most miles of routes open to motorized/mechanized use by the public over any other alternative resulting in moderate impacts to cultural resources. This would allow continued access for vandalism of cultural resources and for continued monitoring of the area to stop such damage. It would also provide access for researchers.

Implementation of travel management decisions under Alternative A would contribute to cultural resource protection by prohibiting additional proliferation of roads by individuals within the Planning Area, which would help protect archaeological and historical sites. Development of a transportation plan in the Monuments would also enhance cultural site access for visitation, research, and protection. Overall impacts to archaeological and historical resources would be moderate.

American Indian Resources: Alternative A would provide the most motorized access to TCPs by American Indians. It would also allow for continued access, damage, and vandalism to American Indian TCPs and archaeological sites by other visitors using motorized and mechanized vehicles. Impacts would range from negligible to minor.

Impacts from Wilderness Characteristics

No areas would be allocated for wilderness characteristics under Alternative A.

Impacts from Vegetation and Fire and Fuels Management

Archaeological and Historical Resources: Restoration activities would continue to be implemented and would affect archaeological and historical resources. In particular, restoration of Great Basin, Ponderosa Pine, and Riparian ecological zones could directly affect archaeological and historical resources. Eradication of noxious weeds may involve surface disturbance which would impact archaeological and historical sites. Sites eligible for listing on the NRHP in these areas would continue to be avoided by any surface disturbing activity and a buffer of 40 meters would continue to be established around villages, as requested by the Tribes. Mitigation of some impacts would be provided by following Section 106 procedures.

Prescribed fires would continue to be allowed across sites not vulnerable to destruction by fire, such as areas which have already burned many times in the past. Areas excluded from fire treatment would be rock art, wooden structures or features, and any area vulnerable to the indirect effects of subsequent erosion. Fire suppression activities may require use of heavy equipment that can directly impact archaeological and historical resources through surface disturbance. Wildland fires may destroy or alter archaeological and historical sites susceptible to damage from fire, heat, or smoke. Fire suppression activities overall would help to stop wildland fire and ultimately protect archaeological and historical resources that might be destroyed or damaged by fire. Therefore, impacts from all vegetation management, including fire and fuels management, would be moderate. Overall impacts from vegetation management would result in direct and indirect impacts to archaeological and historical resources which could be partially mitigated during compliance with Section 106 of the NHPA.

In Vermilion, there have been minimal vegetation treatments projects in the past because fuel loads are generally low, reducing the chance of catastrophic fire. As a result, any treatments to reduce fuel load in the Monument would be small scale and localized, resulting in negligible to moderate impacts. Riparian invasive and exotic species removal could occur in some riparian areas and may directly impact archaeological and historical resources. However, treatment efforts would help to stop root damage and erosion of deposits and structures from invasive species and help to keep archaeological and historical resources intact.

American Indian Resources: The above impacts to cultural and archaeological resources would also apply to American Indian Resources, with the exception that restoration, including fire and fuels management, could also increase some native vegetation. For example, during the Mt. Trumbull restoration efforts in the mid-1990s, large amounts of native tobacco grew in the treatment areas in the years following restoration and subsequent fire treatments where it had not occurred before treatment. Historically, American Indians burned areas on the Arizona Strip prior to Euro-Americans arrival to encourage growth of native plants, as well as for other reasons. Restoration efforts benefit some types of native vegetation and provide additional locations for American Indians to collect such vegetation. Impacts from all vegetation treatments, including fire and fuels management, on American Indian Resources would be moderate. Traditional uses of and access to resources would continue and would be sustainable.

Impacts from Visual Resources

Archaeological and Historical Resources: VRM Class I and II categories would help protect cultural resource sites and landscapes from visual intrusions and surface disturbance on 42 percent of Parashant, 100 percent of Vermilion, and 33 percent of the Arizona Strip FO under Alternative A; however, such categories would also limit research excavations. Major modifications to the visual landscape could be allowed under Class IV on 34 percent of the Monuments and almost half (48%) of the Arizona Strip FO. Maintenance and/or enhancement

of night sky conditions at the local level would protect historic and prehistoric landscapes. Impacts would be minor.

American Indian Resources: The above impacts would also apply to TCPs and landscapes associated with them.

Impacts from Cultural Resources

Archaeological and Historical Resources: In Parashant and the Arizona Strip FO, ongoing protection would be provided to archaeological and historical sites in the existing ACECs. Maintaining the designated Public Use Sites in all three planning areas would provide opportunities to educate the public about past activities on the Monument and allow for public enjoyment of these resources.

Cultural inventories, documentation, research, protective measures, monitoring and site steward patrols would continue to provide information about the past in the Planning Area and to protect cultural resource sites. The impact to archaeological and historical sites would be minor. Because of the additional protection provided by ACECs in the Arizona Strip FO, the impact to archaeological and historical sites would be moderate.

American Indian Resources: Continuing to interpret and direct the public to Public Use Sites could lead to damage and vandalism to American Indian resources at these areas. Opportunities also would be available to interpret and explain past and current American Indian uses of the resources and areas near these public use sites from an American Indian perspective. The presence of the general public at some of these sites may deter American Indian visits and activities. Impacts would be moderate and site specific.

Impacts from Minerals (Arizona Strip FO only)

Archaeological and Historical Resources: Most of the Arizona Strip FO would be open to mineral exploration and development. Direct impacts to archaeological and historical resources from associated ground disturbance would be moderate.

Indirect impacts due to vandalism would also occur. For example, during uranium exploration on the Kanab Plateau during the 1980s, the incidence of vandalism to archaeological sites near the uranium mines dramatically increased during the period when the mines were in operation. Uranium workers were the main cause for the increase and were known to use helicopters and other motorized and mechanized equipment to access previously undisturbed, unrecorded, and significant archaeological sites. These sites were then illegally excavated and the prehistoric artifacts taken. If the price of uranium continues to climb, currently closed uranium mines in the Arizona Strip FO would be reopened. The return of uranium workers would be accompanied by an expected increase in vandalism to archaeological sites near the mines. Impacts would be site

specific and could be major, resulting in a loss of information on the local and regional history and prehistory.

Under Alternative A, approximately 11 percent of the Arizona Strip FO would be closed to mineral material disposals and thus protected from related impacts. Mineral material disposals would continue to be allowed in most ACECs, thus potentially impacting significant archaeological and historical resources. Impacts would be mitigated by following Section 106 procedures.

American Indian Resources: The above impacts for archaeological and historical resources would also apply to American Indian resources, with the addition that mining activities could disrupt access to TCPs and the additional noise and disturbance associated with active mining sites could disturb some activities at nearby TCPs. Impacts would be major and would be site specific. Section 106 procedures may reduce some impacts.

Impacts from Livestock Grazing

Archaeological and Historical Resources: Compaction of soil, additional erosion, and displacement of artifacts associated with livestock grazing would continue under Alternative A. Impacts to archaeological and historic resources would be minor, but more widespread compared to the other alternatives due to more lands being open to grazing..

American Indian Resources: The above impacts for archaeological and historic resources would apply to American Indian resources.

Impacts from Recreation

Archaeological and Historical Resources: Recreation use in the Planning Area would increase due to an increase in regional population, as well as new interest in the area due to the designation of the Monuments. Collection and vandalism to archaeological and historical sites by visitors is thus also expected to increase. Some sites would be monitored, as applicable, deterring adverse impacts from visitors. A substantial portion of monitoring would continue to be conducted by Site Stewards, who would assist in providing information to apprehend vandals. Law enforcement would continue to be used to stop the destruction of the public lands. Educational efforts would continue to encourage protection of cultural resources and generate an appreciation of the values being protected. The impact would be detectable but it would be slight and localized within small areas.

More public land users and more intense recreational use on Arizona Strip FO lands near the communities would result in more direct and indirect impacts to archaeological and historical resources than in either Monument. Impacts in some-specific areas near communities or on some types of archaeological sites, such as caves, rock shelters, or rock art, could be moderate or major for specific targeted sites.

Permitted activities such as SRPs or outfitters and guides would be educated about the provisions of the Archaeological Resources Protection Act (ARPA) and Native American Grave Protection and Repatriation Act NAGPRA, which would help protect archaeological and historical sites. Establishments of visitor limits, supplemental rules, or restrictions based on various strategies, including carrying capacity or limits of acceptable change (LAC), on a case-by-case basis could protect archaeological and historical sites.

American Indian Resources: The above impacts for archaeological and historical resources would also apply to American Indian Resources, with the exception that additional recreational use could interfere with traditional and sacred uses in some areas. Impacts would be moderate.

Impacts from Special Area Designations

Archaeological and Historical Resources: Maintaining the two existing ACECs in Parashant and five ACECs in the Arizona Strip FO that were designated to protect archaeological and historical sites would continue to provide such protection. The importance of the ACECs would be more greatly felt in the Arizona Strip FO as Monument designation, alone, would provide similar or higher form of protection in Parashant.

American Indian Resources: The above impacts for archaeological and historical resources would also apply to American Indian Resources.

Impacts from Lands and Realty

Archaeological and Historical Resources: Land disposals would impact archaeological and historical resources because the lands and associated resources would leave the protection provided by federal laws. Impacts would be direct, long term, and major. Land use authorizations such as ROWs, permits, or leases would cause direct and indirect long term impacts to archaeological and historical resources.

Proposed actions by the Washington County Water Conservancy District such as the Lake Powell Pipeline or the proposed flood control reservoir at Ft. Pearce would also cause direct and indirect long term impacts to archaeological and historical resources.

Other actions proposed by local communities under R&PP leases could also impact archaeological and historical resources. These and impacts mentioned above would be mitigated under Section 106 of the NHPA. But overall impacts from lands and realty would be moderate.

American Indian Resources: The above impacts to archaeological and historical resources from land use authorizations and land disposals would also apply to American Indian Resources.

Alternative BImpacts from Trails and Travel Management

Archaeological and Historical Resources: In the Monuments under Alternative B, roughly one third the miles of motorized and mechanized routes would be open to the public compared to Alternative A. This would be the least among all the alternatives. In addition, the most miles of roads would be closed under this alternative. Compared to Alternative A, these route designations would result in a dramatic decrease of unintentional impacts such as driving or camping on or near sites. On the other hand, fewer open routes under Alternative B may increase vandalism because of reduced areas receiving public and agency monitoring, thus shielding illegal activity from public view. In addition, scientific research would be more expensive under this alternative than under any other because of the challenge of access. Overall impacts to archaeological and historical resources would be moderate.

In the Arizona Strip FO, impacts would be similar to impacts discussed under Alternative A because most of the routes for the Arizona Strip FO remain to be inventoried, evaluated, and designated after this EIS is complete. Impacts from travel on archaeological and historical resources would thus continue to be moderate.

American Indian Resources: Alternative B would limit access so that more traditional areas and sites would remain undisturbed by visitors, including vandals; however, American Indians would also experience increased difficulty in access for purposes of collecting resources and using TCPs. Overall impacts would be moderate.

Impacts from Wilderness Characteristics

Archaeological and Historical Resources: The most acres would be allocated to maintain wilderness characteristics in the Monuments under Alternative B, resulting in the greatest potential for excluding motorized and mechanized access and any associated vandalism or damage. This would increase protection of archaeological and historical resources but could also allow more opportunities for vandals to excavate, remove, or damage archaeological and historical resources away from monitoring by law enforcement, Site Stewards, agency archaeologists, and the public. The impacts would be moderate.

In the Arizona Strip FO, impacts would be similar to those discussed under Alternative B for the Monuments, except that not as many acres would be allocated under this alternative as under Alternative C. Impacts would be minor.

American Indian Resources: Impacts would be similar to those described for archaeological and historic resources as allocating areas to maintain wilderness characteristics would also protect American Indian TCPs while, at the same time, making it harder for American Indians to

access such resources. The impacts would be moderate in the Monuments but minor in the Arizona Strip FO.

Impacts from Vegetation and Fire and Fuels Management

Archaeological and Historical Resources: Alternative B proposes the least amount of acreage for vegetation treatment projects among the alternatives, which would result in the least potential for damage to archaeological and historical resources from such projects. Impacts would be minor.

Having no planned vegetation treatments in the Riparian and Ponderosa Pine ecological zones under Alternative B would benefit archaeological and historical sites within these zones. All other vegetation treatment projects under this alternative, particularly those in the Great Basin Ecological Zone, would have a minor impact because such projects would have NEPA-specific review and would comply with Section 106 of the NHPA. Under such compliance, projects would be redesigned to avoid historic properties, those eligible for or listed on the NRHP.

In Parashant, restoration of Pakoon Springs would result in moderate impacts to archaeological and historical resources, even though the emphasis would be on natural processes. Some impacts could be mitigated and the project would comply with Section 106 of NHPA.

American Indian Resources: The types of impacts would be the same as described above for archaeological and historical Resources.

Impacts from Visual Resources

Archaeological and Historical Resources: VRM Class I and II would help to protect cultural resource sites and landscapes from visual intrusions and surface disturbance on nearly all acres of the Monuments under Alternative B, which is the most area covered among the alternatives. Research excavations could also be limited in all areas of the Monuments because of concerns with visual intrusions. Maintenance and/or enhancement of night sky conditions at the local level would protect historic and prehistoric landscapes. Impacts would be minor.

In the Arizona Strip FO, VRM Class I and II categories would protect cultural resource sites and landscapes from visual intrusions and surface disturbance on approximately one quarter of the Arizona Strip FO under Alternative B, which represents fewer acres of protection compared to Alternative A, but more when compared to the other Alternatives. Impacts would be minor.

American Indian Resources: Impacts would be the same as described above for archaeological and historical resources as the protected areas under VRM Class I and II would also include American Indian TCPs and important landscapes. Impacts would be moderate.

Impacts from Cultural Resources

Archaeological and Historical Resources: Under Alternative B in Parashant, Nampaweap and Witch Pool ACECs designations would discontinue. Impacts, however, would be negligible as Monument status provides similar or more comprehensive protection of archaeological and historical resources within Parashant.

Four additional public use sites in Parashant, three new sites in Vermilion, and one additional site in the Arizona Strip FO would increase the interpretive/educational opportunities throughout the Planning Area. Impacts from the remaining actions and allowable uses would be the same as described under Alternative A and remain minor.

American Indian Resources: Impacts would be the same as described above for archaeological and historic resources.

Impacts from Minerals (Arizona Strip FO only)

Archaeological and Historical Resources: Among the alternatives, Alternative B proposes the least amount of acreage to be open and available for mineral exploration and development with no or minimal restrictions. This action would result in the least amount of surface disturbance and consequential impacts to archaeological and historic resources. Effects would be site specific and moderate for specific archaeological and historical resources.

American Indian Resources: Impacts would be the same as described above for archaeological and historic resources.

Impacts from Livestock Grazing

Archaeological and Historical Resources: In Parashant, impacts to cultural resources from livestock grazing would be eliminated in the Pakoon Springs and Tuweep Allotments and the Cane Springs pasture of the Mud and Cane Allotment under this alternative because they would be closed to grazing.

In Vermilion, closure of the River Pasture of the Lees Ferry Allotment would reduce impacts to cultural resources in this area.

Other livestock grazing impacts in the Monuments would continue. These actions would have a minor impact to archaeological and historical resources. In Arizona Strip FO, impacts from livestock grazing would be the same as Alternative A.

American Indian Resources: Impacts would be the same as described above for archaeological and historic resources.

Impacts from Recreation

Impacts would be the same as described under Alternative A for both archaeological and historic resources and American Indian resources.

Impacts from Special Area Designations

Archaeological and Historical Resources: The two existing ACECs would not be continued in Parashant under Alternative B, and no new ACECs would be created. Impacts would be negligible as Monument status provides similar or superior protection afforded by ACEC designation.

In Arizona Strip FO under this alternative, all the ACECs from Alternative A would continue. Also under Alternative B, the Marble Canyon ACEC would increase in size and three new ACECs would be created, which would provide additional protection to archaeological and historical resources in these areas. As a result, Alternative B proposes the most acres to be covered by ACEC designation for protection of cultural resources in the Arizona Strip FO among the alternatives. Impacts would be moderate and beneficial.

American Indian Resources: Impacts would be the same as described under archaeological and historic resources as the ACEC protection would also apply to sites and locations of importance to American Indians, including TCPs.

Impacts from Lands and Realty (Arizona Strip FO only)

Impacts would be the same as described under Alternative A for both archaeological and historic resources and American Indian resources.

Alternative C

Impacts from Trails and Travel Management

Archaeological and Historical Resources: In the Monuments, 78 percent of those roads described as open under Alternative A would be open for motorized and mechanized use by the public. Compared to Alternative A, fewer roads would be open to the public under Alternative C, resulting in more opportunities for vandalism and more expensive research; however, impacts would not be as intense as under Alternative B. While Alternative C proposes eight times the miles of routes open for administrative use only compared to Alternative A, use on such roads would be minimal and result in few impacts. Overall impacts would be moderate.

The goals of the trail and travel management program and the benefits resulting from the use of the Route Evaluation Tree© process would result in similar impacts as described under Alternative B.

In the Arizona Strip FO impacts from Trails and Travel Management would be the same as described under Alternative A.

American Indian Resources: As discussed above for archaeological and historic resources in the Monuments, Alternative C would limit access compared to Alternative A, which would protect traditional areas and sites from disturbance by visitors, including vandals; however, reduced access would also affect American Indians for collecting resources and using TCPs. Impacts would not be as intense as Alternative B and would be minor.

Impacts from Wilderness Characteristics

Archaeological and Historical Resources: Impacts in the Monuments would be similar to Alternative B, although not as intense as roughly half many acres would be allocated to maintain wilderness characteristics under Alternative C.. Impacts would be minor.

In the Arizona Strip FO, the most acres would be allocated to maintain wilderness characteristics under Alternative C. Impacts would thus be the same as described Alternative C, but more intense. The impacts would be minor.

American Indian Resources: Impacts would be the same as described above for archaeological and historic resources.

Impacts from Vegetation and Fire and Fuels Management

Archaeological and Historical Resources: Impacts would be similar to those described under Alternative B, although more intense as Alternative C proposes more acreage for vegetation restoration, which would result in increased potential for impacts to archaeological and historical resources. Impacts would be minor, however, because Section 106 procedures would be followed.

In Parashant restoration of Pakoon Springs would result in more surface disturbance to surface and subsurface archaeological and historical resources, resulting in a moderate impact. Mitigation measures as a result of Section 106 compliance may reduce impacts.

American Indian Resources: In Parashant, restoration of Pakoon Springs would result in more surface disturbance to archaeological resources of importance to American Indians resulting in a major impact. Increased acreage for vegetation restoration in the Planning Area would also result in greater impacts to archaeological resources; however, restoration also may increase native vegetation of importance to American Indians. Overall impact would be moderate.

Impacts from Visual Resources

Archaeological and Historical Resources: Under Alternative C, 75 percent of Parashant and 99 percent of Vermilion would be assigned to VRM Class I and II, which would protect cultural resource sites and landscapes from visual intrusions and surface disturbance. Also under Alternative C, 25 percent of Parashant and less than one percent of Vermilion would be assigned to VRM Class III and IV, which would allow some modifications of the existing character of the visual landscape so that impacts would be minor.

In Arizona Strip FO, impacts would be similar to those described under Alternative A.

American Indian Resources: Impacts would be the same as described above for archaeological and historical resources.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative B for both archaeological and historic resources and American Indian Resources.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be the same as described under Alternative A for both archaeological and historic resources and American Indian Resources.

Impacts from Livestock Grazing

Impacts would be the same as described Alternative B for both archaeological and historic resources and American Indian Resources.

Impacts from Recreation

Impacts would be the same described under Alternative A for both archaeological and historic resources and American Indian Resources.

Impacts from Special Area Designations

Archaeological and Historical Resources: For Parashant, impacts would be the same as described under Alternative B. For the Arizona Strip FO, roughly one third the acres would be under ACEC protection compared to Alternative B, which would result in less protection to cultural and archaeological resources afforded by ACEC designation. More protection would be offered, however, when compared to Alternative A.

American Indian Resources: Impacts would be the same as described under archaeological and historic resources as the ACEC protection would also apply to sites and locations of importance to American Indians, including TCPs.

Impacts from Lands and Realty (Arizona Strip FO only)

Impacts would be the same as under Alternative A, except that there would be 131 acres more available for exchange, sale, or lease. Impacts would remain moderate and would be mitigated under Section 106 of NHPA.

American Indian Resources: Impacts would be the same as described above for archaeological and historical resources.

Alternative D

Impacts from Trails and Travel Management

Archaeological and Historical Resources: With the exception of Alternative A, the greatest access for all motorized and mechanized vehicle users, including the OHV community, would be provided under Alternative D, resulting in a moderate impact to archaeological and historical resources. Access for research would be easier and more cost effective under this alternative than under any other except Alternative A.

American Indian Resources: Impacts would be similar to those above for archaeological and historic resources in the Monuments. Having easier access to various sites in the Planning Area, with the exception of Alternative A, would aid American Indians in collecting resources and using TCPs. Ease of access, however, would also increase the potential for traditional areas and sites to be disturbed by visitors, including vandals

Impacts from Wilderness Characteristics

Archaeological and Historical Resources: The fewest acres would be allocated for wilderness characteristics under Alternative D compared to the other action alternatives, with the exception of the Arizona Strip FO where Alternatives D and E propose similar allocation amounts (less than Alternatives A, B, and C). As a result, Alternative D would have provide fewer opportunities for vandalism away from routes, while, at the same time, create a greater potential for unintentional and direct impacts to archaeological and historical resources due to increased motorized access compared to the other action alternatives. There could also be fewer opportunities for vandalism compared to the other action alternatives as more access would be provided for Site Stewards, law enforcement, and the general public. Impacts would be minor.

American Indian Resources: Impacts would be the same as described above for archaeological and historic resources, with the exception that fewer acres allocated to maintain wilderness

characteristic would increase motorized access to more areas would be available to American Indians for traditional uses. Impacts would be minor.

Impacts from Vegetation and Fire and Fuels Management

Archaeological and Historical Resources: Impacts would be the same as described under Alternative C, with the exception that more acres are proposed for vegetation treatment in the Great Basin and Ponderosa Pine ecological zones under Alternative D. This would result in more widespread impacts to archaeological and historical resources. Impacts would be moderate.

American Indian Resources: Impacts would be the same as described for archaeological and historical resources. Larger acreages proposed for vegetation treatment would have greater surface disturbance resulting in more impacts to archaeological sites and TCPs considered important to American Indians. The same vegetation treatments could also provide more opportunities for native vegetation to prosper, such as native tobacco. Impacts would be moderate.

Impacts from Visual Resources

Archaeological and Historical Resources: In Parashant and Vermilion, the fewest acres under any alternative are proposed for VRM Class I and II. This means that the visual integrity of historic and archaeological landscapes and resources in the Monuments would not be protected as much as in other alternatives. Impacts would be moderate.

In Arizona Strip FO, about one-eighth of the planning area would be managed under VRM Classes I and II. This would protect archaeological and historical sites and their contexts over a larger area than under Alternative A, but not as much as under Alternative B. Impacts would be minor.

American Indian Resources: Impacts would be the same as described above for archaeological and historical resources.

Impacts from Cultural

Impacts would be the same as described under Alternative B for both archaeological and historical resources and American Indian resources.

Impacts from Minerals (Arizona Strip FO only)

Archaeological and Historical Resources: Impacts would be the same as described under Alternative A, except that there would be an increase in the amount of acreage open for mineral development with the least restrictions. Impacts would be moderate due to the potential to destroy or damage archaeological and historical sites during mineral exploration or development.

American Indian Resources: Impacts would be the same as described above for archaeological and historical resources, with the addition that access to TCPs could be affected. In addition, noise and disturbance from active mining sites could affect some site-specific uses at TCPs. Impacts would be moderate, with some major impacts in site-specific areas major.

Impacts from Livestock Grazing

Impacts would be the same as described under as Alternative A for both archaeological and historical resources and American Indian resources.

Impacts from Recreation

Impacts would be the same as described under Alternative A for both archaeological and historical resources and American Indian resources.

Impacts from Special Area Designations

Archaeological and Historical Resources: Impacts in Parashant would be the same as described under Alternative B. In the Arizona Strip FO, the least amount of acres would be under ACEC designation protecting cultural resources among the alternatives, including Alternative A. Impacts would be moderate.

American Indian Resources: Impacts would be the same as described above for archaeological and historical resources as there would be the least amount of ACEC protection in the Arizona Strip FO provided to sites and areas of importance to American Indians.

Impacts from Lands and Realty (Arizona Strip FO only)

Impacts would be the same as described under Alternative C for both archaeological and historical resources and American Indian resources.

*Alternative E: Preferred*Impacts from Trails and Travel Management

Archaeological and Historical Resources: The types of impacts would be the same as described under Alternative A. Impacts would be more intense than under Alternatives B and C due to the increase of miles of roads that would be open to motorized public travel under Alternative E. Impacts would be less intense than under Alternatives A and D due to fewer miles of roads that would be open. Overall impacts would be moderate.

American Indian Resources: Impacts would be similar to those described above for archaeological and historical resources.

Impacts from Wilderness Characteristics

Archaeological and Historical Resources: In the Monuments, fewer acres would be allocated to maintain wilderness characteristics under this alternative than under Alternatives B or C, but more compared to Alternative D. Therefore, sites damage resulting from motorized access would be more likely under Alternative E than under Alternatives B and C, and less likely when compared to Alternative D.

In the Arizona Strip FO, impacts would be similar to those described under Alternative D.

American Indian Resources: Impacts would be similar to those described above for archaeological and historical resources.

Impacts from Vegetation and Fire and Fuels Management

Archaeological and Historical Resources: Overall impacts would be the similar to those described under Alternatives C or D due to similar acres being proposed for treatment, depending upon ecological zone.

In Parashant, restoration and facilities proposed for Pakoon Springs could impact archaeological and historical resources more than under any other alternative. Protective barriers to protect resources would help to stop damage to these resources. Development of interpretive trails and facilities at Cane Springs could also impact archaeological and historical resources. The opportunities for environmental education at both Pakoon and Cane springs would enhance the understanding, appreciation, and protection of archaeological and historical resources at these sites as well as the Mojave Desert and Great Basin regions. Impacts would be moderate.

American Indian Resources: Impacts would be the same as described under Alternative D

Impacts from Visual Resources

Impacts would be the same as described under Alternative B in the Monuments and the same as Alternative D in the Arizona Strip FO for both archaeological and historical resources and American Indian resources.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative B for both archaeological and historical resources and American Indian resources, with the exception that there would be fewer acres under ACEC protection in the Arizona Strip FO.

Impacts from Minerals (Arizona Strip FO only)

Archaeological and Historical Resources: Impacts would be the same as described under Alternative A. Impacts would be slightly more intense as there would be more acres available without restrictions, although this amount would be less than that proposed under Alternative D. Impacts would be moderate.

American Indian Resources: Impacts would be the same as described under Alternative D.

Impacts from Livestock Grazing

Impacts would be the same as described under Alternative A for both archaeological and historical resources and American Indian resources.

Impacts from Recreation

Impacts would be the same as described under Alternative D for archaeological and historical resources. Impacts would be the same as described under Alternative A for American Indian Resources.

Impacts from Special Area Designations

Archaeological and Historical Resources: The types of impacts would be similar to those described under Alternative A, although more widespread as more acres would be under ACEC protection for cultural and archaeological resources. Alternative E also proposes more ACEC acres compared to Alternatives C and D, but considerably fewer acres compared to Alternative B. Impacts would thus not be as widespread as under Alternative B.

American Indian Resources: Impacts would be the same as discussed above for archaeological and historical resources.

Impacts from Lands and Realty (Arizona Strip FO only)

Impacts would be the same as described under Alternatives C for both archaeological and historical resources and American Indian resources.

Cumulative Impacts

Archaeological and Historical Resources: The increase in regional population and popularity of the Monuments is correlated to an increase in damage to archaeological and historical resources from visitation, including that caused by vandalism. Vegetation treatments, mineral development, disposal of public lands, land use authorizations, and livestock grazing would continue to impact archaeological and historical resources. Conversely, creation of the national monuments on the Arizona Strip and additional wilderness areas west of the Planning Area in Nevada, as well as additional public awareness of the potential loss of irretrievable open spaces and cultural resources, may provide additional protection and more funding to conduct research and preserve archaeological and historical sites in the region.

American Indian Resources: Increasing regional population and the resulting increase in visitation and use of the Planning Area would result in degradation of the vegetation in some areas and on some TCPs, as well as loss of the original landscape context, such as the natural quiet and isolation. This may affect some TCPs and interfere with some traditional and sacred uses. The creation of the Monuments, as well as other monuments, national parks, NRAs, wilderness areas, and other protected places in the surrounding area would offer long-term protection of traditional landscapes and allow traditional uses to continue in some areas.

VISUAL RESOURCES

This section presents potential impacts of the alternatives on visual resources, specifically the potential for various management scenarios to create visual changes or contrasts, given the desired visual resource objectives proposed for each alternative. Additionally, the potential impacts of alternatives that may increase sources of artificial light at night; reduce the scenic quality ratings, as seen from high sensitivity foreground or middle ground viewpoints; block or disrupt existing views; or reduce public opportunities to view scenic resources are presented.

Methods and Assumptions

To the extent practical, spatial data was used to compare the proposed management of each alternative to the VRM classes (objectives). In the case of VRM class proposals, evaluations were made against the current condition of visual resources. Current conditions were identified through a recent updated visual inventory of the Planning Area, which was used to assign visual resource inventory (VRI) classes to existing visual resources. Impacts from VRM class assignments proposed under all of the alternatives, including Alternative A, are measured against VRI classes. Impacts would be expected in situations where VRM class assignments differ from VRI classes identified. Figures 4.1 – 4.12 are used to illustrate the discrepancies.

Various actions that might create changes to the basic landscape elements of form, line, color, and texture were considered in the estimation of impacts. In addition, viewing time-of-day, season, and duration were considered, where possible. Potential impacts to scenic quality were estimated by evaluating the potential for management actions to noticeably change one or more of the seven factors (landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications) evaluated during the inventory. The results of analysis describe the potential for reduction, maintenance, or enhancement of overall baseline visual settings for each alternative.

Effects are quantified where possible. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible:** The impact would not be detectable. The effect on visual resources, or the ability to access and/or enjoy them, would be at the lowest levels of detection, barely measurable with any perceptible consequences, either beneficial or adverse, on visual resources.
- Minor:** The impact would be detectable. The effect on visual resources, or the ability to access and/or enjoy them, would be measurable or perceptible, but it would be slight and localized within a relatively small area. The action would not permanently affect visual character or diminish quality features.
- Moderate:** The impact would be readily apparent. The adverse impact would be measurable and perceptible. The beneficial impact would be readily apparent. The action would change one or more character-defining features or opportunities of the visual resource, but it would not diminish the integrity of the resource to the extent that it would be permanently jeopardized.
- Major:** The impact would be severe. The adverse impact on visual resources, or the ability to access and/or enjoy them, would be substantial, noticeable, and permanent. Conversely, the beneficial impact would be a substantial improvement to existing contrast, scenic quality, or generate important new viewing opportunities. The action would change one or more character defining features of the resource, diminishing or improving the integrity of the resource to the extent that it would be permanently changed.

The following assumptions regarding the future management of visual resources are made:

- All laws for the management and protection of visual resources would be followed, to the extent allowed by the budget and available personnel.
- Any new surface disturbing activities proposed would be subject to NEPA analysis, including a VRM contrast rating.

- Activities proposed that would not initially meet VRM objectives for the area would be mitigated to the extent needed to meet the objectives. Those activities proposed that could not be mitigated would not be authorized.
- Some proactive restoration of areas that do not meet desired visual resource objectives may be completed each year.
- VRI classes are informational in nature and provide the basis for considering visual values in the RMP process. VRM classes (I, II, III, and IV) are designated through the land use planning process, and the assignment of VRM classes is based on management decisions made in RMPs.
- All actions proposed during the RMP process must consider the importance of the visual values and the effects the project may have on these values.

Impacts to Visual Resources

Impacts to Visual Resources would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Wilderness Characteristics
- Vegetation and Fire and Fuels Management
- Soil, Water, and Air
- Fish and Wildlife
- Special Status Species
- Visual Resources
- Cultural Resources
- Special Area Designations (Wilderness)
- Livestock Grazing
- Lands and Realty
- Recreation and Visitor Services

Alternative A: No Action

Impacts from Trails and Travel Management

Under Alternative A, Travel Management Areas (TMAs) would not be identified. Keeping wilderness and some other sensitive areas closed to motorized and mechanized vehicle use would protect visual resources and non-motorized viewing opportunities on 283,263 acres in Parashant, 89,829 acres in Vermilion, and 123,100 acres in the Arizona Strip FO. Impacts would be indirect and long term. Managing Parashant's 1,700 miles, Vermilion's 457 miles, and Arizona Strip FO's 4,353 miles of existing open routes as designated open routes and would continue to influence the landscape. Travel on these routes would continue to produce intermittent dust, causing indirect, short-term, negligible to moderate visual contrasts with the

landscape. The visual impact of 60 miles of existing closed routes in Parashant, 105 miles in Vermilion, and 249 miles in Arizona Strip FO, all of which are mainly within wilderness areas, would continue to diminish, either by direct active reclamation actions or by indirect natural processes. Additionally, actions such as rerouting certain alignments, monitoring the creation of unauthorized routes and obscuring/rehabilitating those found, and active and/or passive natural reclamation of any temporary routes would enhance visual resources by reducing visual contrasts on a localized, long-term basis. Active reclamation of routes would reduce contrast more quickly in the short-term.

Employing a designated trails and travel management system of existing routes would indirectly ensure that the public would continue to have the opportunity to view scenic resources over the long-term. No travel management actions under Alternative A would block or disrupt views as seen from a variety of popular viewing locations. Restricting travel to designated routes would reduce the potential for creation of new impacts outside those routes. Impacts would be long term and range from negligible to minor. Constraining road maintenance to within the existing disturbed travel surface areas would reduce the potential for increasing the impacts of designated routes. Impacts would be direct, localized, short or long term, and range from minor to moderate. The continued use of existing material sites on BLM lands for road maintenance would affect visual resources over the long term on a localized basis. New material sites would result in negligible to moderate impacts, depending on pit location as viewed from key observation points, quantity of material to be removed, and compatibility of subsurface/surface soil color.

Vehicles traveling along roads, aircraft landing and/or overhead, and nighttime road-related construction and/or maintenance work are the only significant sources of transportation-related artificial light at night that could be seen in the Planning Area. Impacts to night sky would generally be short-term, localized, and negligible. However, in the case of major, nighttime roadwork using high power artificial lighting, impacts to night sky conditions could be moderate, though short-term and localized.

Impacts from Wilderness Characteristics

No areas with wilderness characteristics are proposed under Alternative A.

Impacts from Vegetation and Fire and Fuels Management

Over the long term, restoration and vegetative treatments designed to improve ecological conditions could indirectly enhance visual resources on a localized basis. However, in the short-term, methods used to achieve improved ecological conditions could directly create visual changes to landscape form, line, color, and texture. Such impacts would range from minor to moderate, depending on scope and magnitude of treatment and the methods used. Chemical and biological methods would tend to gradually create visual contrasts that mimic natural ecological change, whereas fire and mechanical methods would create such contrasts more suddenly and

noticeably. Depending on the VRM class where a particular treatment is conducted, impacts to the landscape could either meet or not meet the visual objective for the class. For example, treatments that create moderate change in VRM Class III areas would likely meet the visual standard, whereas moderate change that attracts attention in a VRM Class I or II area would not. Under Alternative A, the amount of acreage that could be treated in each ecological zone would not be limited; theoretically and with sufficient funds, widespread landscape change could occur if all acres needing treatment in the Planning Area were treated. Under this extreme, impacts would be major, although this scenario is very unlikely. The possibility of localized, moderate to major impacts would be reduced by prohibiting chaining and other methods that cause substantial surface disturbances resulting in visual landscape changes in VRM Class I and II areas. Depending on location, the application of seasonal restrictions, temporary reductions, or elimination of other authorized activities in some vegetation treatment areas could directly reduce opportunities for the public to view some scenic resources. Ongoing cleanup of the abandoned equipment and materials at Pakoon Springs would indirectly improve visual quality in the area over the long term.

Under the current wilderness management plan, wildland fire would be the only treatment method considered for the ponderosa pine forest atop Mt. Trumbull, which has the potential for minor impacts to visual resources in that area. Large fire management camps using artificial lighting could directly affect night sky conditions on a localized, short-term basis. The ongoing application of minimum impact suppression tactics and minimum tool policy for fire operations in wilderness and NPS-proposed wilderness areas would indirectly contribute to maintaining landscape character in these areas. Impacts to visual resources from prevention and mitigation programs aimed at reducing unwanted ignitions in wildland fire use and non-wildland fire use areas would be similar to those described above for vegetative treatments. However, actions related to prevention could reduce human-caused ignitions and related visual impacts caused by fire. Impacts would range from minor to moderate. Post fire rehabilitation methods, such as seed drilling, mulching, netting, or hydroseeding, could directly result in localized visual contrasts. Impacts would be minor to moderate in the short term, but become negligible in the long term. Wildland fires and prescribed fires would result in smoke, causing short-term minor to moderate impacts on visual resources, including the night sky. Such fires would also affect visual resources due to increased vehicle traffic, fire lines, and the contrast between burned and unburned areas. The latter could vary in size from a few acres to tens of thousands of acres.

Noxious weeds could affect visual resources to a minor degree by replacing native vegetation and creating changes in existing landscape form, color, or texture. Attempts to control or eliminate noxious weeds would reduce such impacts. This impact would not apply to areas along the Paria River as no removal efforts would be applied to this area. In Parashant and Arizona Strip FO, visual impacts created by the localized, small-scale collection or use of vegetative materials would be negligible; however, any vegetation removal associated with larger-scale research or restoration efforts could produce impacts similar to those described above for mechanical vegetative treatments. This impact would not apply to Vermilion as the Monument would be closed to the sale of vegetative products.

Impacts from Soil, Water, and Air

Soil: Placing restrictions and guidelines on surface disturbing and reclamation activities in all three planning areas under Alternative A, and requiring the removal of facilities or improvements no longer necessary and reclaiming such sites, would mitigate visual contrasts created by a variety of resource management projects. Impacts would be localized, both short and long term, and range from moderate to major. Actions to improve riparian and watershed condition in areas of moderate to severe erosion would affect visual resources in a manner similar to those described under Impacts from Vegetation and Fire and Fuels Management.

Water: Over the long term, avoiding floodplain occupancy and development in all three planning areas would moderately reduce the potential for creating localized visual contrasts in the existing landscape. However, it would also reduce the possibility for developing recreation sites that could enhance the public's opportunity to view scenic, riparian resources.

Air: Requiring the mitigation of impacts from fugitive dust during surface disturbing projects would help maintain visual resource conditions.

Impacts from Fish and Wildlife

Under Alternative A, existing public access for hunting and wildlife viewing opportunities would be preserved. Maintaining the Mt. Trumbull Watchable Wildlife Area in Parashant would continue to attract visitors for the purpose of viewing wildlife in their natural settings. Rudimentary facilities could be developed in this Watchable Wildlife area and result in localized, long-term impacts to visual resources ranging from negligible to minor. No impacts from Watchable Wildlife areas would occur in Vermilion or the Arizona Strip FO as no such areas would be maintained.

Restoring native wildlife populations could result in larger wildlife populations that may occasionally over-utilize vegetation on a localized, short-term basis, creating a visual contrast that would be negligible to minor. Constructing and/or modifying of wildlife water developments would create visual contrasts with surrounding landscapes. Impacts would be localized and long-term and range from minor to moderate, depending on the placement, design, and use of native materials and the area's VRM class assignment. Placing a priority on maintaining existing facilities over constructing new facilities would reduce the potential for affecting visual resources at new sites. Impacts would be long term and localized, and range from minor to moderate. Limiting fence construction in pronghorn habitat would cause a minor reduction in the potential for new impacts to visual resources.

Impacts from Special Status Species

The protective management prescribed for special status species (including those relating to riparian habitats, ACECs, and non-ACEC habitats) would generally complement the maintenance of landscape character and the conservation of visual resources. Restoration measures that involve surface- or vegetation-disturbing components, however, would create noticeable contrast or reduce scenic quality ratings. Such impacts would be direct and short term, and could range from minor to moderate, depending on the type of treatment/restoration and the amount of change that it would cause to existing landscape form, line, color, or texture. Reducing or restricting public access in special status species habitats could reduce public opportunities to view some scenic resources. Impacts would be direct and long term, and could range from negligible to moderate, depending on the type and location of the restriction and its overlap with known scenic viewing locations.

Impacts from Visual Resources

Under Alternative A, designated wilderness areas would continue to be assigned to VRM Class I, which would provide long-term maintenance of existing landscape character and viewing opportunities. Any future wilderness or wild and scenic river designations made by Congress would result, by policy, in the affected lands being automatically assigned to VRM Class I. This would represent a shift from existing combinations of Class II, III, and IV areas to the highest visual management standard, preserving existing landscape character.

Use of the VRM contrast rating process would continue to provide site-specific visual analysis of proposed surface disturbing activities to ensure that such projects meet visual objectives in project areas through design features and/or mitigation. Both short-term and long-term, indirect effects would accrue over the life of the Plan as management practices are constrained by the contrast rating process to sustain or enhance visual landscapes. Research design proposals would be required to mitigate impacts to scenic quality and conform to the assigned VRM class objectives. Under Alternative A, actions to restore natural conditions or appearance in areas already modified may succeed on a localized basis, reducing some visual contrast long-term.

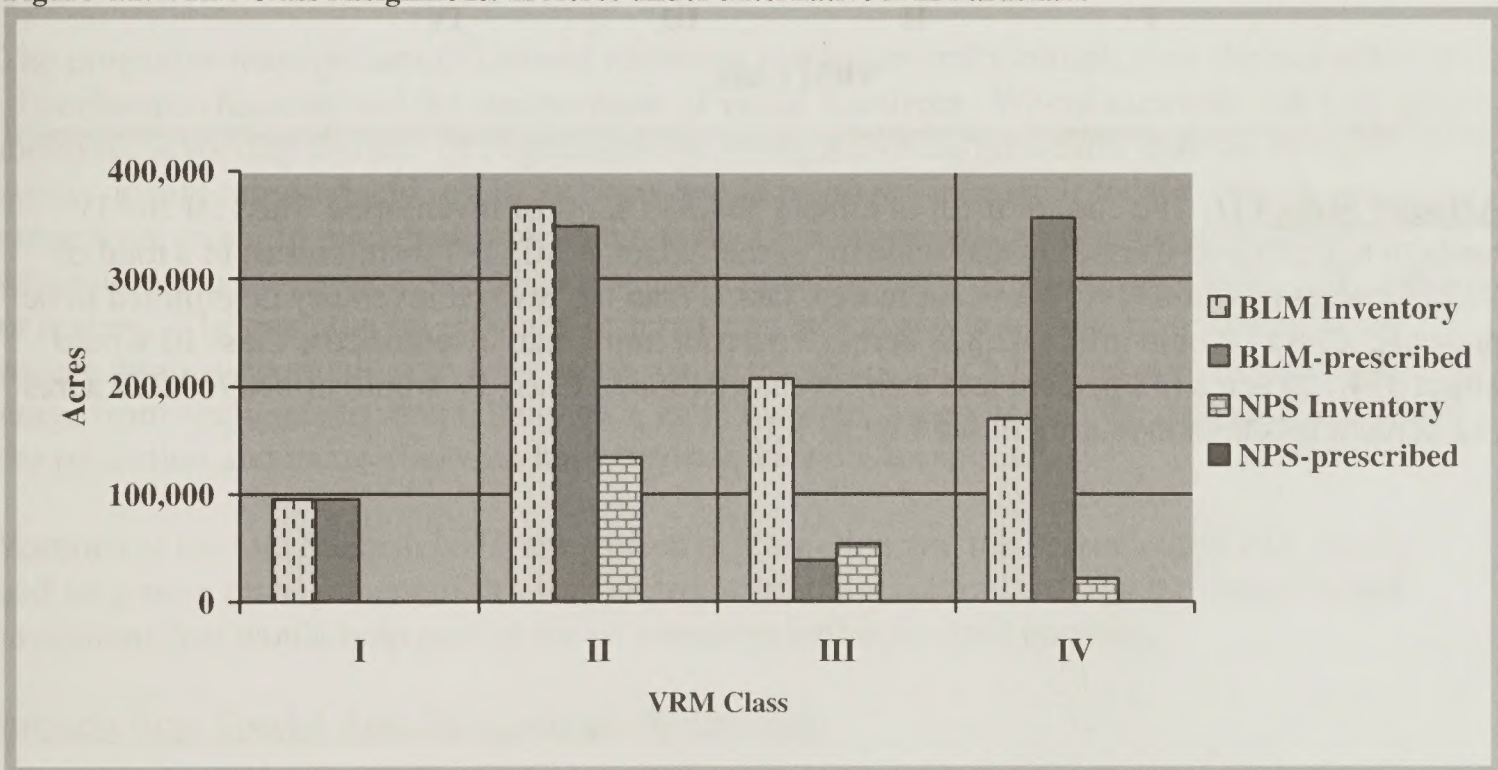
Under Alternative A, no special provisions would be made to manage, reduce, or preclude actions or facilities that contribute to unnatural night sky conditions. In the long-term, this could result in the production of artificial light sources and that could affect night skies.

Under Alternative A, current VRM classes in all three planning areas as assigned to BLM lands in the 1992 Arizona Strip RMP would continue. NPS lands in Parashant would remain unassigned. However, in the long term, NPS wilderness management practices would indirectly continue to maintain inherent visual values on the majority of the NPS portion of the Monument. Specific impacts to each of the three planning areas relating to specific VRM class assignments are presented below:

Parashant: In the Mt. Trumbull and Parashant RCAs, visual resources would receive a minor commitment of lands with Class III and IV values to a more protective Class II management standard, which would retain the existing character of the landscapes and, generally, allow natural processes to be major agent of change to existing landscapes. Over time, landscapes in Parashant would appear more natural as the signs of management activities become less obvious. The overall commitment to a Class II visual standard on BLM lands under Alternative A would be about 5 percent less than the revised inventory determined to be present (see Figure 4.1).

Under Alternative A’s VRM class assignment, 82 percent of lands with Class III inventory values in the Pakoon Basin, Poverty Mountain, and southern Shivwits Plateau and 5 percent of lands with Class II inventory values in the Hobble Canyon, Tweed Points, Jump Canyon and Hidden Hills, would primarily be managed under Class IV visual standard. The long-term, indirect result could involve major visual changes allowed to the landscape on up to 356,820 acres, which is 110 percent more than current VRI conditions indicate are present for Class IV values (see Figure 4.1). Impacts could increase by potentially allowing more activities resulting in major modifications of the existing landscape character to dominate certain views, limit some public viewing opportunities, and reduce scenic quality; however, such impacts would be minimized to the extent possible through careful project location, minimal disturbance, and project design that would repeat the basic landscape elements.

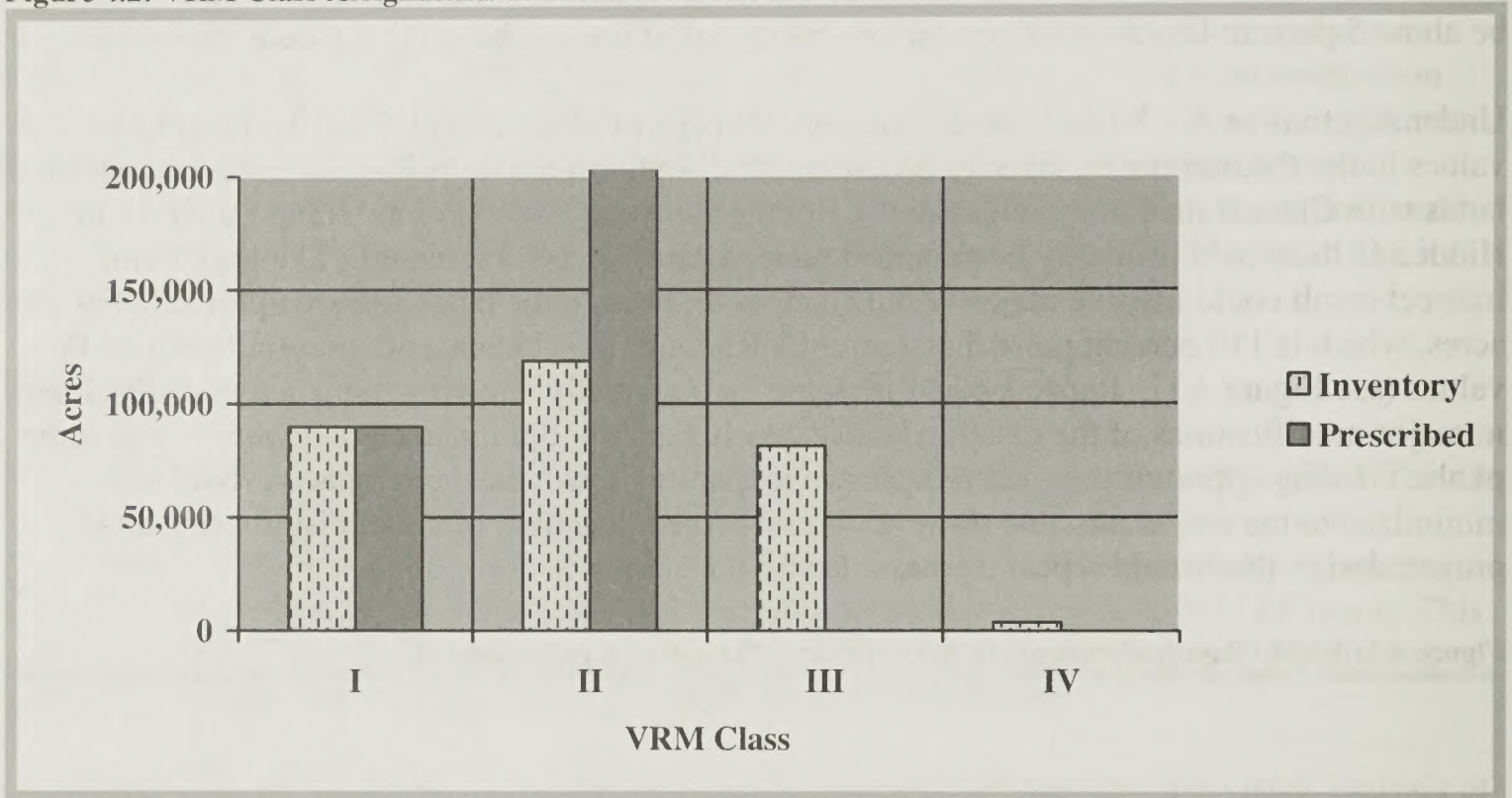
Figure 4.1: VRM Class Assignments in Acres under Alternative A in Parashant



Vermilion: Under Alternative A, no lands in Vermilion would be managed at the Class III or IV standard. In addition, 85,223 acres of inventoried Class III and IV lands would be committed to

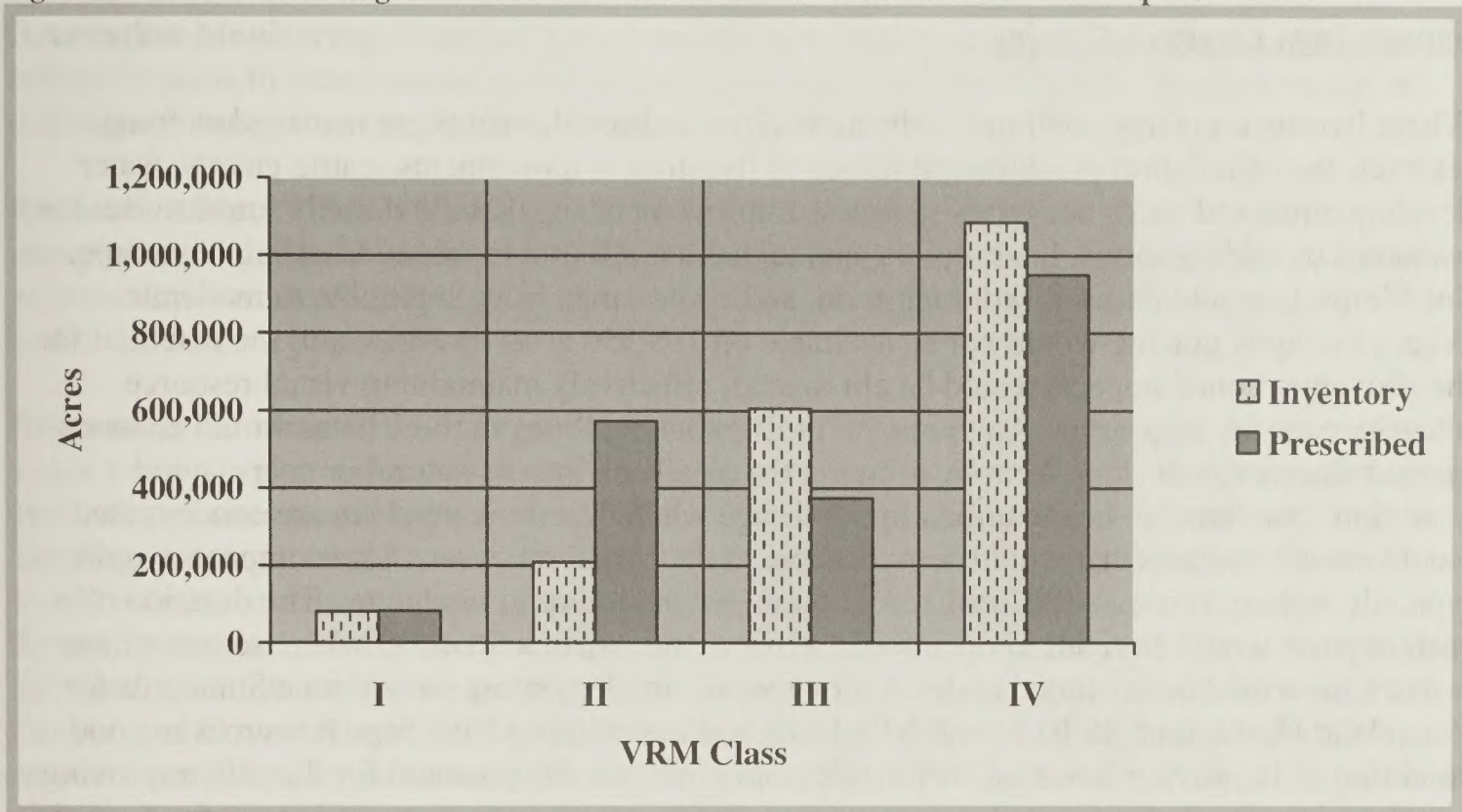
a prescribed Class II visual standard, which would result in 72 percent more Class II acres than the revised inventory determined to be present (see Figure 4.2). Impacts to visual resources would be indirect and major, and involve the long-term maintenance of the existing character of the landscapes and retention of important scenic qualities and the opportunities for the public to view them.

Figure 4.2: VRM Class Assignments in Acres under Alternative A in Vermilion



Arizona Strip FO: The commitment of almost 364,380 acres of inventoried Class III and IV lands to a prescribed Class II visual standard in the Arizona Strip FO would result in a total of 573,243 acres of Class II (174 percent more Class II than the revised inventory determined to be present). Class I would affect 82,828 acres (3 percent more than inventoried); Class III would effect 374,725 acres (38 percent less than inventoried); and Class IV would effect 950,227 acres (12 percent less than inventoried; see Figure 4.3).

Figure 4.3: VRM Class Assignments in Acres under Alternative A in the Arizona Strip FO



Impacts from Cultural Resources

The protective management of cultural resources would generally complement the maintenance of landscape character and the conservation of visual resources. Where excavation or restoration measures involving surface- or vegetation-disturbing activities, noticeable contrast or reduced scenic quality ratings could result. Impacts would be direct, localized, and short-term, and could range from minor to moderate, depending on the type, scope, and magnitude of excavation/restoration and the amount of change that it would cause to existing landscape form, line, color, or texture. The potential for reducing or restricting public access to cultural resources could reduce public opportunities to view some scenic resources. Such reduced opportunities could range from negligible to direct, long-term, and moderate, depending on the type and location of the restriction and its overlap with known scenic viewing locations.

Portions of the Old Spanish NHT are located in Vermilion and the Arizona Strip FO. Interim and long-term management of this trail aimed at retaining the trail’s character would include provisions that would help protect visual resources within the trail corridor.

Impacts from Special Area Designations (Wilderness)

Management associated with BLM designated wilderness and NPS proposed wilderness (Parashant only) would maintain existing landscape character. Additionally, a VRM assignment of Class I for wilderness areas would perpetuate a reduced potential for actions to create noticeable change to a moderate to major degree over the long-term.

Impacts from Livestock Grazing

Where livestock grazing continues to be authorized and/or allotments are managed as forage reserves, the installation of additional fences or livestock improvements (cattle guards, water developments, and roads necessary to access improvement sites) could directly impact visual resources by adding forms, lines, colors, and textures not found in the surrounding landscape. Such impacts would be localized, long-term, and could range from negligible to moderate. Where livestock grazing would not be available on 199,350 acres in Parashant, the potential for the abovementioned impacts would be eliminated, effectively maintaining visual resource integrity over the long-term. Any removal of livestock facilities in these areas would enhance visual resources in the long-term by bringing the area back into its natural or near-natural condition. Moderate to heavy utilization of forage where livestock numbers are concentrated would create contrasts that would be noticeable to the casual observer. These impacts would typically be long-term, direct, localized, and range from minor to moderate. The duration of such impacts would be reduced on 144,023 acres in the Arizona Strip FO where season of use restrictions would be instituted under Alternative A. Implementing the Arizona Standards for Rangeland Health on both BLM and NPS lands and maintaining Vital Sign resources in good condition or improving status on NPS lands would increase the potential for directly improving or enhancing visual resources. Impacts would be widespread, long-term, and range from minor to moderate.

Impacts from Recreation and Visitor Services/Interpretation and Environmental Education

General: Impacts from relying on the maintenance and/or enhancement of remote, generally natural landscapes to sustain a variety of recreation activities and experiences would be short-term and localized, and range from negligible to minor.

Special Recreation Management Areas/Special Management Areas: SRMAs would likely attract more visitor use to the Planning Area in the long-term. Increased visitor use could generate localized visual contrasts in the form of dust from traffic, changes to camping areas, and potential impacts from illegal, off-road driving. More intensive management of these areas may enhance public access to scenic views and overlooks. The continuation of current management of the NPS-proposed wilderness Special Management Area (SMA) would complement the protection of visual resources.

Recreation Management Actions: Under Alternative A, maintaining and/or restoring natural, remote settings would help preserve visual landscapes over the long-term. Current recreation management decisions aimed at minimizing signing in Area B, focusing the few recreation-related facilities in roaded-natural portions of Area A, and signing to minimize OHV damage would complement protection of visual resources. The placement and design of recreation developments, facilities, and projects could contrast with the natural landscape, although they would be planned to minimize any potential contrasts and to meet the VRM objectives of the area, thus reducing impacts.

Recreation Monitoring: Establishing recreation carrying capacities could reduce recreation-related impacts to visual resource and reduce the potential of new impacts. Impacts would be indirect and range from negligible to minor.

Recreation Marketing: Providing information to visitors regarding recreation opportunities, interpretation of natural and human history, and specific rules and regulations would continue to improve land-use behaviors that are compatible with visual resources. Impacts would be direct and range from negligible to minor.

Recreation Administration: Dispersed recreation activities would create fewer impacts to visual resources than more intensive, concentrated recreation uses. Closing and/or rehabilitating undeveloped sites would restore the visual resources of those sites. Placing limits/restrictions on camping, recreation activities in sensitive areas, motor speed events, and competitive events would reduce recreation-related impacts on visual resources. Impacts would be long term. Requiring the use of weed-free feed for recreational stock would continue to reduce the potential for visual contrasts created by noxious weed infestations. Continuing visitor use limits in Paria Canyon and Coyote Buttes (Vermilion only) would complement the maintenance of visual resource conditions by reducing the potential for visual impacts attributable to larger numbers of visitors at-one-time at popular attraction sites.

Impacts from Lands and Realty

Management prescriptions related to acquisition, retention, and withdrawals, especially within the Monuments, would generally complement the maintenance of existing landscape character and public opportunities to view visual resources. Land-use authorizations involving new surface- or vegetation-disturbing components, primarily restricted to the Arizona Strip FO, would result in direct, localized, short- and long-term impacts, which could include a reduction in scenic quality ratings. Such changes could range from minor to moderate, depending on the type of authorization and the amount of change it would cause to existing landscape form, line, color, or texture.

In the Arizona Strip FO, up to 25,188 acres could potential leave Federal ownership through various forms of disposal. The potential for the loss of public viewing of scenic resources on these lands would be low. However, development of disposed lands could create minor to major, long-term, direct, localized visual contrasts with the surrounding landscape.

Alternative B

Impacts from Trails and Travel Management

Impacts from OHV closed area designations and prohibitions on new road construction would be similar to those described under Alternative A in the Monuments. Differing from Alternative A, TMAs would be identified under Alternative B. The Rural TMA would only apply to the

Arizona Strip FO. Management of visual resources on 9 percent of this planning area in the Rural TMA would range from retaining the existing character of the landscape and scenic backdrops or settings for communities to providing for management activities that require major modifications. Because such modifications could be evident to the casual viewer, but would usually replicate the basic elements found in the predominant natural features of the characteristic landscape, the overall impact to visual resources in the Rural TMA could be minor to moderate. Management of the Backways TMA would retain the existing character of the landscape on 9 percent of Parashant, 2 percent of Vermilion, and 14 percent of the Arizona Strip FO. Although some modifications to the landscape would occur, because such modifications would be required to blend with the surrounding landscape, the overall impact to visual resources in the Backways TMA would be minor. Impacts from managing the Specialized TMA on 4 percent of Parashant, 12 percent of Vermilion, and 40 percent of the Arizona Strip FO, would range from retaining the existing character of the landscape to allowing major modification. Because such modifications could be evident to the casual viewer, although they would usually replicate the basic elements found in the predominant natural features of the characteristic landscape, the overall impact to visual resources in the Specialized TMA could range from minor to moderate. The majority of the Monuments (86-87 percent) would be managed under the Primitive TMA, while 36 percent of the Arizona Strip FO would be managed under this TMA. Impacts within this TMA could range from preserving to providing for partial retention of the existing character of the landscape. Although some modifications to the landscape would be allowed in the Primitive TMA, such modifications would need to be unnoticeable or blend with the surrounding landscape. As a result, impacts to visual resources in the Primitive TMA would range from negligible to minor.

In the long-term, the combined total of 1,726 miles of roads open to the public and to administrative use only in Parashant and 457 such miles open in Vermilion would bring about the types of visual influences described under Alternative A, although impacts would be reduced 23 and 16 percent, respectively, with fewer miles open under Alternative B. Since the majority of the 444 miles of routes in Parashant and 171 miles of routes in Vermilion proposed for closure and rehabilitation under Alternative B would be tertiary routes where existing visual influence is generally negligible to minor, the overall long-term, indirect enhancement to visual resources would only be negligible on a localized basis and minor on a widespread basis. Impacts from actions such as rerouting and monitoring the creation of unauthorized routes and closing those found would be the same as described under Alternative A. Overall impacts from intermittent dust and to night sky conditions would also be the same as described under Alternative A, even though there would be a 63 percent reduction in roads open to the public under Alternative B in Parashant and 52 percent reduction in Vermilion. Based on information gathered from traffic counters on several primary roads, a 71 percent increase in annual traffic is expected to occur throughout Parashant over the life of the Plan. Traffic in Vermilion is expected to increase by 405 percent. Thus, although a 52 to 63 percent reduction in public open roads under Alternative B would reduce the amount of potential traffic on all roads, the actual use of the primary roads, where the majority of traffic occurs, is expected to remain static or experience a minor to major increase over the life of the Plan. The 52 to 63 percent reduction in open roads to the public,

however, would affect opportunities to view some scenic resources if critical viewing routes are closed. Impacts would be long term and range from a moderate to major. The impacts from restricting travel to designated routes, route maintenance actions, and existing and new road material sites would be the same as described under Alternative A.

Impacts in the Arizona Strip FO from implementing Alternative B would differ from the Monuments in the following ways:

- The impacts of Closed OHV area designations in designated wilderness and Marble Canyon ACEC would take place on 92,648 acres or 25 percent less than Arizona Strip Alternative A.
- The effects of the designated trails and travel management system for the Littlefield and Ferry Swale Sub-regions would occur on 254 miles of open public roads, 176 miles of administrative-use-only roads, and 40 miles of open for non-motorized/non-mechanized use; the combined total of 470 miles perpetuate the types of visual influences already described in Alternative A, only on 13 percent fewer miles.
- The visual effects of actions related to closed routes would take place on 90 miles closed and rehabilitated in the Arizona Strip, or a 350 percent increase from Alternative A.
- The impacts related to intermittent dust, night sky conditions, and viewing opportunities described in Parashant Alternative B would be similar in Arizona Strip, though attributable to 23 percent fewer open public roads from Alternative A and to the absence of any Open OHV areas and motorized speed events.
- The potential effects of a designated trails and travel management system for the St. George Basin Sub-region could occur on up to 290 miles of open public roads, 200 miles of administrative-use-only roads, and 80 miles of open for non-motorized/non-mechanized use; the combined total of up to 570 miles perpetuate the types of visual influences already described in Alternative A, only on up to 8 percent fewer miles.
- The visual effects of actions related to closed routes in the St. George Sub-region could take place on up to 110 miles closed and rehabilitated in the sub-region, or a 2 percent increase from Alternative A.
- The impacts related to intermittent dust, night sky conditions, and viewing opportunities described in Parashant Alternative B could be similar in St. George Basin, though attributable to 46 percent fewer open public roads from Alternative A.
- Pending future route designation decisions, managing 4,697 miles of existing routes as a 'preliminary route network' (within the St. George Basin, Colorado City, Main Street, Uinkaret, Yellowstone Mesa, Kanab Plateau, Grama Canyon, Buckskin, White Sage, and House Rock Sub-regions), would be a continuation of the existing visual influence that existing system has on the landscape.
- Use of the primary roads could increase 173 percent over the life of the plan.
- By allowing motorized-vehicles may to pull off designated routes 100 feet either side of centerline in "limited" area designations, short-term and long-term, direct and localized negligible to moderate visual landscape change could occur.

Impacts from Wilderness Characteristics

The combination of management actions and allowable uses aimed at maintaining or enhancing areas having wilderness characteristics would generally complement the retention or preservation of visual resources and existing landscapes. Under Alternative B, such complementary management would occur on 39 percent of Parashant, 33 percent of Vermilion, and 2 percent of the Arizona Strip FO, which does not include existing wilderness or NPS-proposed wilderness.

Impacts from Vegetation and Fire and Fuels Management

Localized impacts to visual resources from restoration and vegetative treatment methods would be the same as those described under Alternative A. However, impacts would be less widespread under Alternative B because only 2 to 3 percent of each of the three planning areas could be treated, which would result in a major reduction in potential impacts to visual resources compared to Alternative A (under which the entire Monument could be treated). Such treatments would also be limited to two ecological zones in Parashant and the Arizona Strip FO and one ecological zone in Vermilion, limiting the area of impact compared to Alternative A where all ecological zones could be treated. Impacts from the possible treatments proposed under Alternative B would be long-term, site-specific, and range from negligible to minor. The potential for moderate to major, short- and long-term impacts on NPS lands in Parashant would be reduced by prohibiting chaining and other methods that cause substantial surface disturbance; however, such impacts could occur on BLM lands. Potential impacts to opportunities to view some scenic resources due to possible seasonal restrictions, temporary reductions, or elimination of authorized activities in some vegetation treatment areas would be the same as described under Alternative A. Restoration efforts proposed for Pakoon Springs would have negligible impacts to visual resources in that allotment while closing the Cane Springs pasture of the Mud and Cane Allotment and removing the fencing around the spring under Alternative B would slightly enhance visual resources in the area. Restoration efforts to remove invasive plant species along the Paria River would be limited to the use of non-powered, hand tools. As a result, the scope of any one project would be minimized, and impacts would be short-term and minor.

Under Alternative B, the wilderness management plan would be amended to allow for wildland fire use to be used for restoration efforts in the Ponderosa Pine forest of Mt. Trumbull, which could result in minor to moderate impacts visual resources in the short-term, and negligible to minor impacts in the long-term. Because the results of management-ignited fire can emulate natural-ignition fires and natural ecological change, the use of fire to restore ecological condition and enhance wilderness character could meet VRM Class I objectives. The application of minimum impact suppression tactics and minimum tool policy for fire operations in wilderness and NPS-proposed wilderness areas would be the same as described under Alternative A. Impacts to visual resources from prevention and mitigation programs, wildland fires, prescribed fires, and post fire rehabilitation methods and efforts would be the same as described Alternative A, as would impacts to night sky conditions from operating large fire management camps.

Impacts to visual resources from noxious weed prevention/elimination would be the same as described under Alternative A, as would research/restoration-related use of vegetative materials, but only on the acres described above for restoration treatments.

Impacts from Soil, Water, and Air

Impacts from Air, Water, and Soil would be the same as described under Alternative A, with the exception that, under the soils program, impacts from watershed improvements/ treatments would primarily be localized in the Upper Lang's Run, Black Rock Mountain, Upper Parashant, Lower Hurricane Valley, Fort Pearce Salinity Area, Clayhole Flood Control Structures Area, and Wild Band Valley watersheds in Parashant and/or Arizona Strip FO. Riparian and watershed improvements/treatments would be considered for all watersheds in Vermilion, which would affect visual resources in a manner similar to general impacts that would stem from vegetation management.

Impacts from Fish and Wildlife

Impacts would be the same as described under Alternative A, with a few exceptions. Under Alternative B, public access for hunting and wildlife viewing opportunities could be greatly reduced by route designation decisions. No new water developments or improvements would occur on NPS lands in Parashant, preventing the creation of new visual contrasts related to such developments. In addition, fences not necessary for range management or other administrative purposes would be removed under Alternative B, which would improve visual landscape conditions. Finally, in the Arizona Strip FO, protective management prescribed for Bighorn Sheep ACECs would generally complement retention of visual resources on 48,076 acres or two percent of the Arizona Strip. Impacts would be long-term and localized, ranging from minor to moderate.

Impacts from Special Status Species

Overall impacts would be the same as described under Alternative A.

Impacts from Visual Resources

Impacts from future Congressional designations, prohibiting activities that could not be mitigated to achieve long-term visual objective(s), and from the use of the VRM contrast rating process would be the same as described under Alternative A. Allowing research/ restoration actions to exceed VRM class objectives in the short-term (0-5 years) but not in the long-term (over 5 years) under Alternative B would likely result in noticeable, short-term impacts to research/restoration sites and viewing opportunities near those sites. Impacts would be direct and range from negligible to minor. Bringing existing facilities or other landscape contrasts into conformance with visual objectives would enhance local scenic conditions and viewing opportunities.

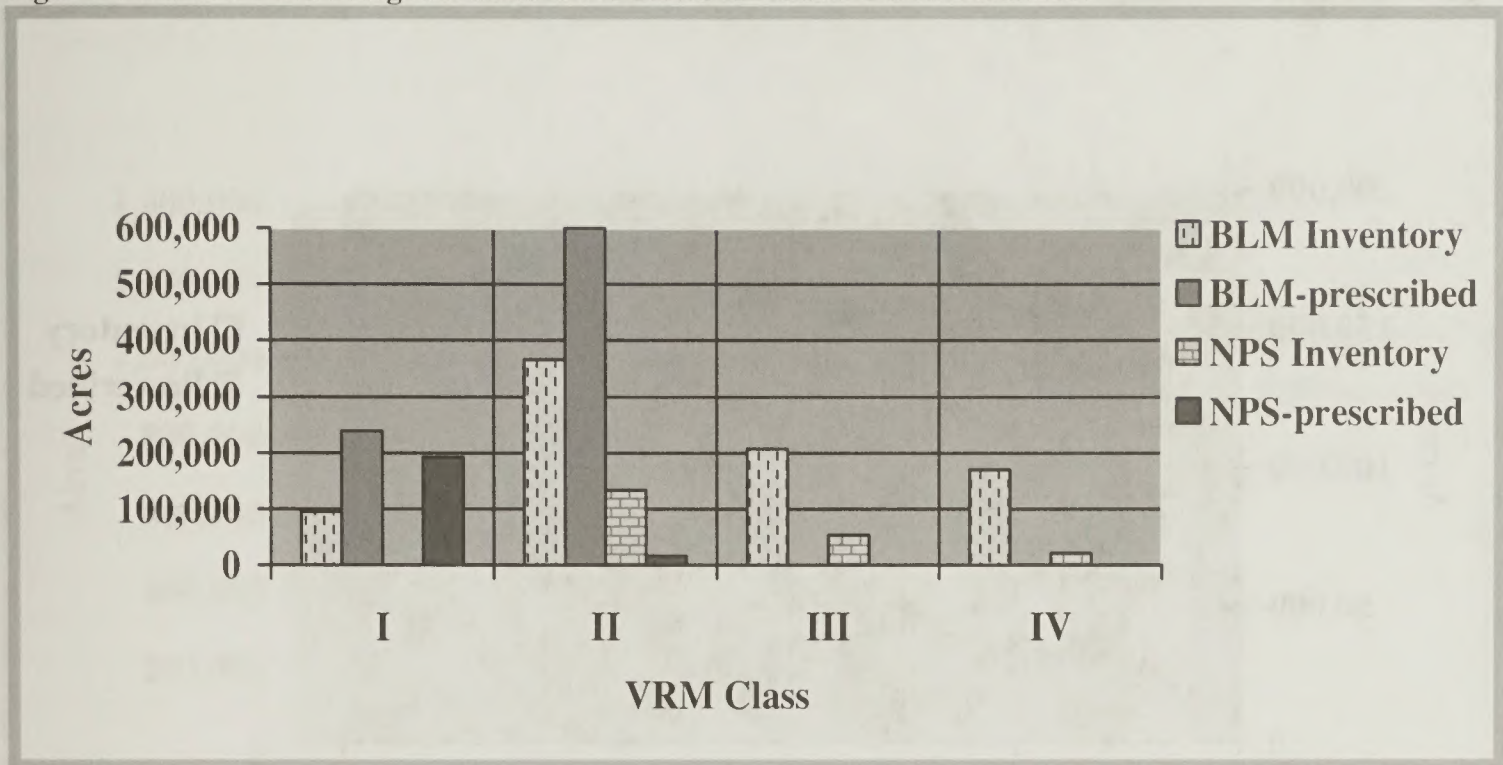
Indirectly, night sky conditions would be maintained over the long-term under Alternative B, as actions would be prohibited that create artificial light at night.

Under Alternative B, all BLM and NPS lands would be assigned to Class I and II in Parashant and Vermilion, except 12 acres in each Monument which would be assigned to Class IV. Alternative B would thus provide the greatest contribution to maintaining the "remote character" of the Monuments. How impacts to each of the three planning areas relating to specific VRM class assignments under Alternative B compare to Alternative A are presented below:

Parashant: The types of impacts to visual resources from assigning VRM Class I under Alternative B would be similar to those described in Alternative A, albeit more widespread as roughly 32 percent more of the Monument would be assigned to this VRM Class, including all 188,121 acres of NPS-proposed wilderness lands and 145,084 acres identified with wilderness characteristics.

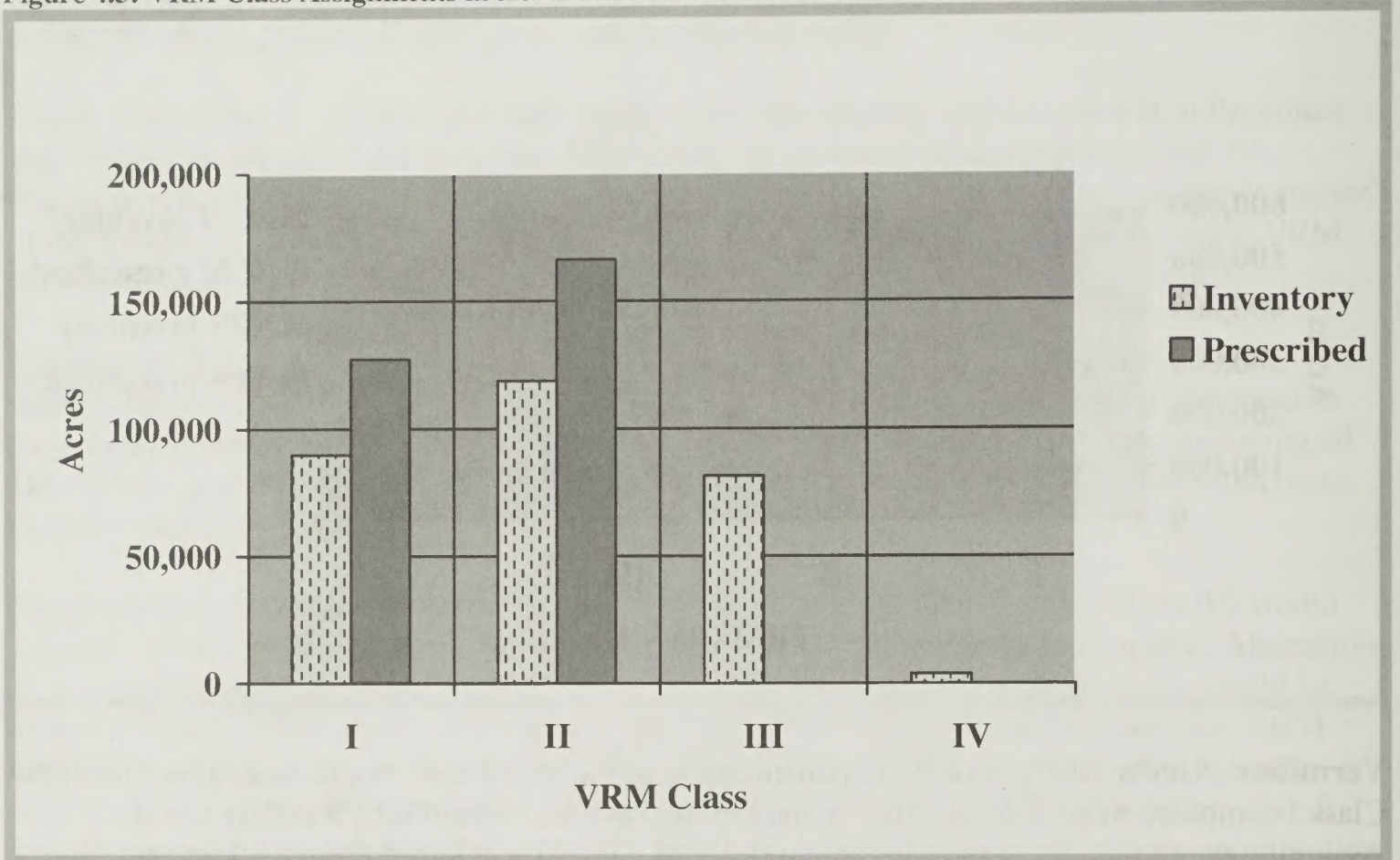
Assigning the remainder of the Monument to VRM Class II (except 12 acres Class IV) would represent a 64 percent increase over the inventoried Class II BLM lands compared to Alternative A, and an 87 percent decrease from the inventoried NPS Class II lands (those lands would be assigned VRM Class I as discussed above; see Figure 4.4). The types of impacts from VRM Class II assignments would be similar to those described under Alternative A, although more widespread as 77 percent more lands would be assigned to VRM Class II under Alternative B. Impacts to visual resources would be indirect and major, and involve the long-term conservation of landscapes and retention of important scenic qualities and the opportunities for the public to view them. Additionally, under Alternative B, visual resources on 59 percent of the Monument with inventoried Class III and IV values would be managed under VRM Class I and II, which would provide long-term maintenance of the existing character of the landscape.

Figure 4.4: VRM Class Assignments in Acres under Alternative B in Parashant



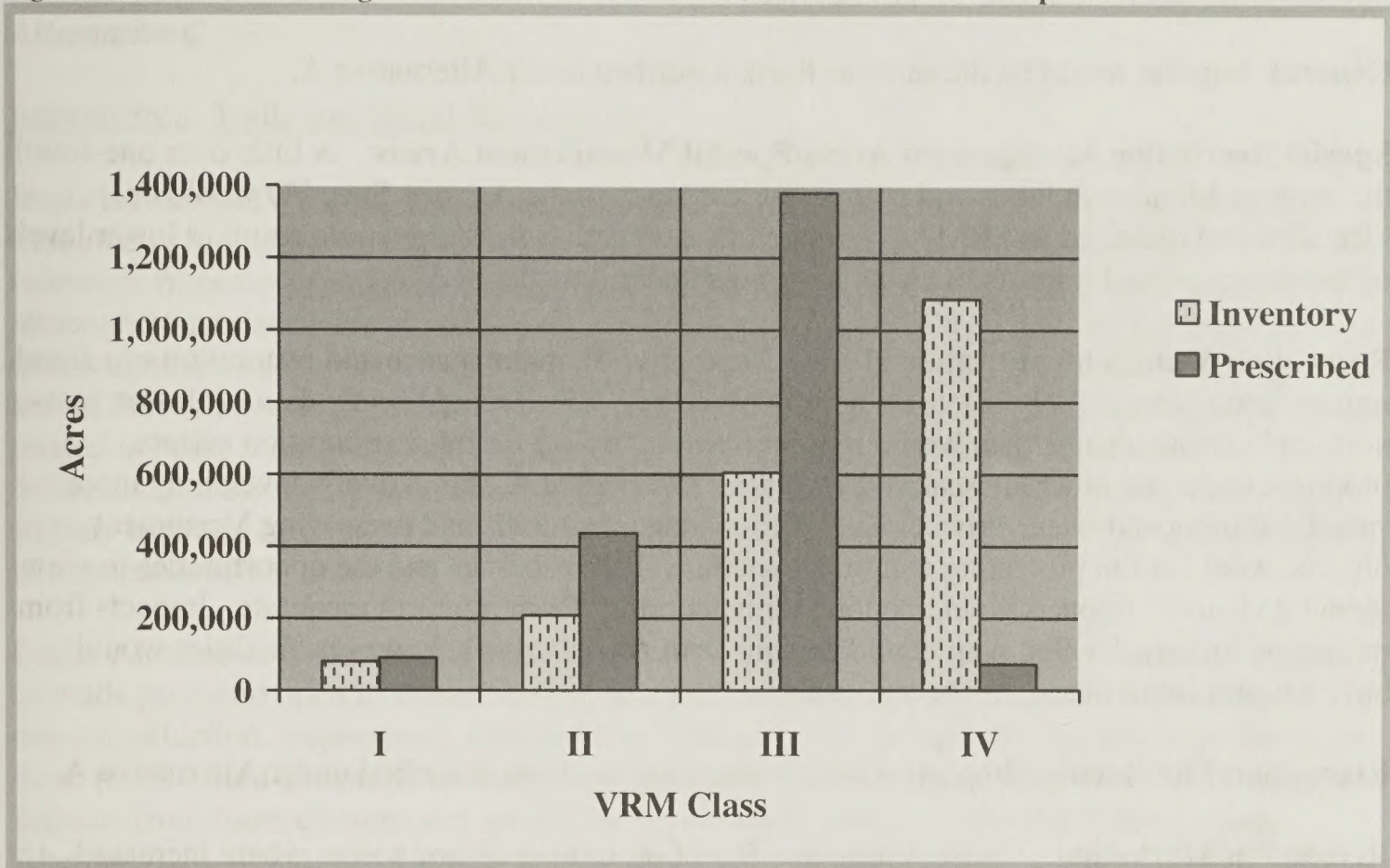
Vermilion: Under Alternative B, 42 percent more of the Monument would be assigned to VRM Class I compared to both Alternative A and the total acres of identified VRI Class I lands. Assigning the remainder of the Monument to VRM Class II would represent a 40 percent increase over the inventoried Class II lands, although this would represent a decrease compared to Alternative A, as those lands would be assigned to VRM Class I and thus experience more long-term conservation/retention of the existing landscape. Additionally, visual resources on 29 percent of the of the Monument with inventoried Class III and IV values would be managed under VRM Class I and II, which would provide long-term maintenance of the existing character of the landscape. The remaining 12 acres located various existing mineral material sites would be assigned to Class IV, which would allow for localized, moderate and long-term visual contrast. Figure 4.5 illustrates the VRM Class assignments under Alternative B in Vermilion

Figure 4.5: VRM Class Assignments in Acres under Alternative B in Vermilion



Arizona Strip FO: Under Alternative B, 11 percent more would be assigned to VRM Class I compared to Alternative A, which would be 13 percent more than the total acres of identified VRI Class I lands. The additional acreage associated with some areas having wilderness characteristics. The commitment of 437,256 acres to a Class II VRM standard would represent a 109 percent increase over the inventoried Class II lands and a 24 percent decrease from Alternative A. The commitment of 1,379,468 acres to a Class III VRM standard would represent a 128 percent increase over the inventoried Class III lands and a 268 percent increase from Alternative A. The commitment of 72,803 acres to a Class IV standard would represent a 93 percent decrease from the inventoried Class IV lands and Alternative A. Figure 4.6 illustrates the VRM Class assignments under Alternative B in the Arizona Strip FO

Figure 4.6: VRM Class Assignments in Acres under Alternative B in Arizona Strip FO



Impacts from Cultural Resources

Overall impacts would be the same as described under Alternative A.

Impacts from Special Area Designations (Wilderness)

Impacts would essentially be the same as those described in Alternative A, with the exception that NPS-proposed wilderness lands would also be assigned to VRM Class I, thus receiving the same protection as designated wilderness on BLM lands.

Impacts from Livestock Grazing

Overall impacts would be similar to those described under Alternative A, except that additional improvements to visual resources would occur because approximately twice as many acres in Parashant and over 124,160 times the acres in the Arizona Strip would be closed under Alternative B. In addition, 15,610 acres would be closed in Vermilion, improving visual resources in the Lees Ferry Allotment. Finally, seasonal restrictions would be placed on an additional 8,939 acres in Parashant, which would also improve visual impacts from grazing.

Impacts from Recreation and Visitor Services

General: Impacts would be the same as those described under Alternative A.

Special Recreation Management Areas/Special Management Areas: A little over one-fourth the acres of Monument lands and 36 percent less lands in the Arizona Strip FO would be identified and managed as SRMAs compared to Alternative A, which could result in lower levels of recreation-related impacts to visual resources under Alternative B.

Recreation Management Actions: Under Alternative B, maintenance and restoration of natural, remote settings would rely solely on natural processes, which would bring about a slower, less-noticeable visual change than would more proactive, project-oriented restoration actions proposed under the other alternatives, including Alternative A. Proactively developing more specific signing and interpretive plans tied to management units and preserving Monument objects, would aid in protecting and/or enhancing visual resources and the opportunities to view them by visitors. Impacts would be long term and range from minor to moderate. Impacts from recreation facility development would be similar to Alternative A; however, facilities would have to conform to management unit goals.

Recreation Monitoring: Impacts would be the same as those described under Alternative A.

Recreation Marketing: Under Alternative B, not promoting visitor access where increased visitation could create unacceptable changes to sensitive resources would reduce the potential for visitor-related impacts to visual resources. Impacts would be indirect, long term, and localized, and range from minor to moderate. Identifying and eventually increasing in the use of driving tours routes would enhance opportunities to view scenic resources. Impacts would be direct and long term. On the other hand, increased use of driving routes would fugitive dust along such routes. These impacts would be direct, localized, and short term.

Recreation Administration: Overall impacts would be the same as those described under Alternative A, with the exception that limiting vehicle camping to designated sites would further reduce localized impacts to visual resources from camping. In addition, prohibiting the commercial use of horses and pack stock in Paria Canyon could reduce the potential for impacts to viewing opportunities and creating visual contrast to a negligible to minor degree, long-term

Impacts from Lands and Realty

Impacts would essentially be the same as those described under Alternative A. The only exception is that ongoing maintenance by ADOT of existing drainage structures/areas on the north side of Highway 89A in Vermilion would create direct, short-term, localized minor to moderate visual contrast.

Alternative C

Impacts from Trails and Travel Management

Impacts from OHV closed area designations and prohibitions on new road construction in the Monuments would be similar to those described in Alternative A. The types of impacts to visual resources from the management of TMAs would be the same as described under Alternative B, although 16 percent more of Parashant and 19 percent more of Vermilion would experience minor to moderate impacts related to being managed as the Specialized TMA, while 15 percent less of Parashant and 19 percent less of Vermilion would experience negligible to minor impacts related to being managed as the Primitive TMA. In addition, The Rural TMA would be delineated on less than 1 percent of Vermilion. Since the acres proposed for each TMA varies slightly between Alternatives B and C in the Arizona Strip FO (within +/- 2 percent), differences in impacts would be minimal.

Under Alternative C, the combined total of 1,551 miles in Parashant and 446 miles in Vermilion of roads proposed open to the public and to administrative use would be a 10 percent and 2 percent reduction, respectively, compared to Alternative A. Long-term impacts from travel on these roads would be similar to those described under Alternative A, albeit somewhat reduced. Impacts from route closures and rehabilitation would be similar to those described under Alternative B, although not as intense and widespread as only half as many routes would be closed under Alternative C. Impacts from rerouting and monitoring the creation of unauthorized routes and closing those found would be the same as those described under Alternative A. Impacts from intermittent dust and to night sky conditions would also be similar those described under Alternative A, although reduced due to the reduction in roads open to the public compared to Alternative A. This reduction would also result in minor, long-term impacts to public opportunities to view some scenic resources if critical viewing routes are closed. The impacts from restricting travel to designated routes, route maintenance actions, and existing and new road material sites would be similar to those described under Alternative A, although additional route improvement activities (e.g., grading, widening, realignment, etc.) could create localized, long-term, minor to moderate impacts within standard maintenance widths, rather than merely within existing roadbed disturbance zones.

Impacts in the Arizona Strip FO from implementing Alternative C would differ from the Monuments in the following ways:

- The effects of the designated trails and travel management system for the Littlefield and Ferry Swale Sub-regions would occur on 373 miles of open public roads, 99 miles of administrative use only roads, and 40 miles of open for non-motorized/non-mechanized use; the combined total of 512 miles perpetuate the types of visual influences already described in Alternative A, only on 6% fewer miles.

- The visual impacts of actions related to closed routes would take place on 48 miles closed and rehabilitated in the Arizona Strip, or a 47% decrease from Alternative B.
- The impacts related to intermittent dust, night sky conditions, and viewing opportunities described in Parashant Alternative B could be similar in the Littlefield and Ferry Swale Sub-regions, though attributable to 24% fewer open public roads than Alternative A.
- Use of the 1,481-acre Open OHV area designations and the larger motorized speed event area could impact visual resources with negligible to moderate amounts of airborne dust on a short-term, localized basis. The Open OHV areas could result in minor to moderate visual contrast over the long-term as unlimited off-road use creates new routes.
- The potential effects of a designated trails and travel management system for the St. George Basin Sub-region could occur on up to 470 miles of open public roads, 80 miles of administrative-use-only roads, and 80 miles of open for non-motorized/non-mechanized use; the combined total of up to 630 miles perpetuate the types of visual influences already described in Alternative A.
- The visual impacts of actions related to closed routes in the St. George Sub-region could take place on up to 60 miles closed and rehabilitated in the sub-region, or a 44% decrease from Alternative A.
- The impacts related to intermittent dust, night sky conditions, and viewing opportunities described in Parashant Alternative B could be similar in St. George Basin, though attributable to 12% fewer open public roads from Alternative A.
- The effects of a 'preliminary route network' pending future route designation decisions for applicable sub-regions would be similar to Alternative B, however, for those sub-regions or parts of sub-regions that would be within a 'limited to existing roads and trails' OHV area designation, the impacts to visual resources would be similar to those described in Parashant Alternative A.

Impacts from Wilderness Characteristics

Overall impacts would essentially be the same as those described in Alternative B. Complementary management relating to wilderness characteristics would occur on roughly 45 and 58 percent less acres than proposed under Alternative B in Parashant and Vermilion, respectively. There would be approximately 68% more acres than proposed under Alternative B in Arizona Strip FO.

Impacts from Vegetation and Fire and Fuels Management

Localized impacts to visual resources from restoration and vegetative treatment methods would be the same as those described in Alternative A. However, impacts would be less widespread under Alternative C, as only 10 percent of Parashant and the Arizona Strip FO and 14 percent of Vermilion could be treated, which would be a major reduction in potential impacts compared to Alternative A (under which the entire Monument could be treated), although the potential for impacts would be greater than under Alternative B. Impacts from treating 10 – 14 percent of the Monument would be long term and minor, and be restricted to three ecological zones on NPS

lands, but more widespread on BLM lands as they would potentially occur in all ecological zones in the three planning areas. Under Alternative C, impacts due to restrictions on chaining and other methods that cause substantial surface disturbance would be the same as described under Alternative A. Potential impacts to public opportunities to view some scenic resources due to possible seasonal restrictions, temporary reductions, or elimination of authorized activities in some vegetation treatment areas would be the same as Alternative A. Under Alternative C, active restoration methods would be employed at Pakoon Springs, which could result in short-term, minor to moderate impacts, depending upon method used. In the long-term, a restored wetland area would moderately enhance both visual quality and the opportunities for public viewing. Closing Cane Springs to grazing and installing fencing around the springs would enhance existing visual resources, while developing the site for interpretation would moderately enhance public opportunities for viewing riparian scenery. While a rest area/picnic area would further enhance such viewing opportunities, facility development to accomplish that aim could produce direct, localized, visual contrast that may not meet VRM Class II objectives. Impacts would range from minor to moderate.

Impacts to night sky conditions from operating large fire management camps would be the same as described Alternative A. The application of minimum impact suppression tactics and minimum tool policy for fire operations in wilderness and NPS-proposed wilderness areas would indirectly be the same as described under Alternative A. Impacts to visual resources from prevention and mitigation programs and wildland fires, prescribed fires and post fire rehabilitation methods and efforts would be the same as Alternative A.

Impacts to visual resources from noxious weed prevention/elimination would be the same as described under Alternative A, with the exception that impacts from using non-motorized hand tools to remove invasive weeds along the Paria River would be the same as described under Alternative B. Impacts from restoration treatments at Mt. Trumbull would be the same as described under Alternative B. Impacts from research/restoration-related use of vegetative materials would be the same as described under Alternative A, but only on the acres described above for restoration treatments.

Impacts from Soil, Water, and Air

Impacts would be the same as those described under Alternative B.

Impacts from Fish and Wildlife

Under Alternative C, public access for hunting and wildlife viewing opportunities could be somewhat reduced by route designation decisions compared to Alternative A, although impacts would be not as intense as under Alternative B. The types of impacts from the management of Watchable Wildlife areas would be similar to those described in Alternative A, although more widespread as four new Watchable Wildlife areas would be identified in Parashant, one in Vermilion, and five in the Arizona Strip FO.

Impacts from management activities carried out to restore native wildlife populations would be the same as described under Alternative A. Impacts related to the construction of wildlife habitat improvement projects and fences in pronghorn habitat would be the same as those described under Alternative B.

Impacts from Special Status Species

Impacts would essentially be the same as those described in Alternative A.

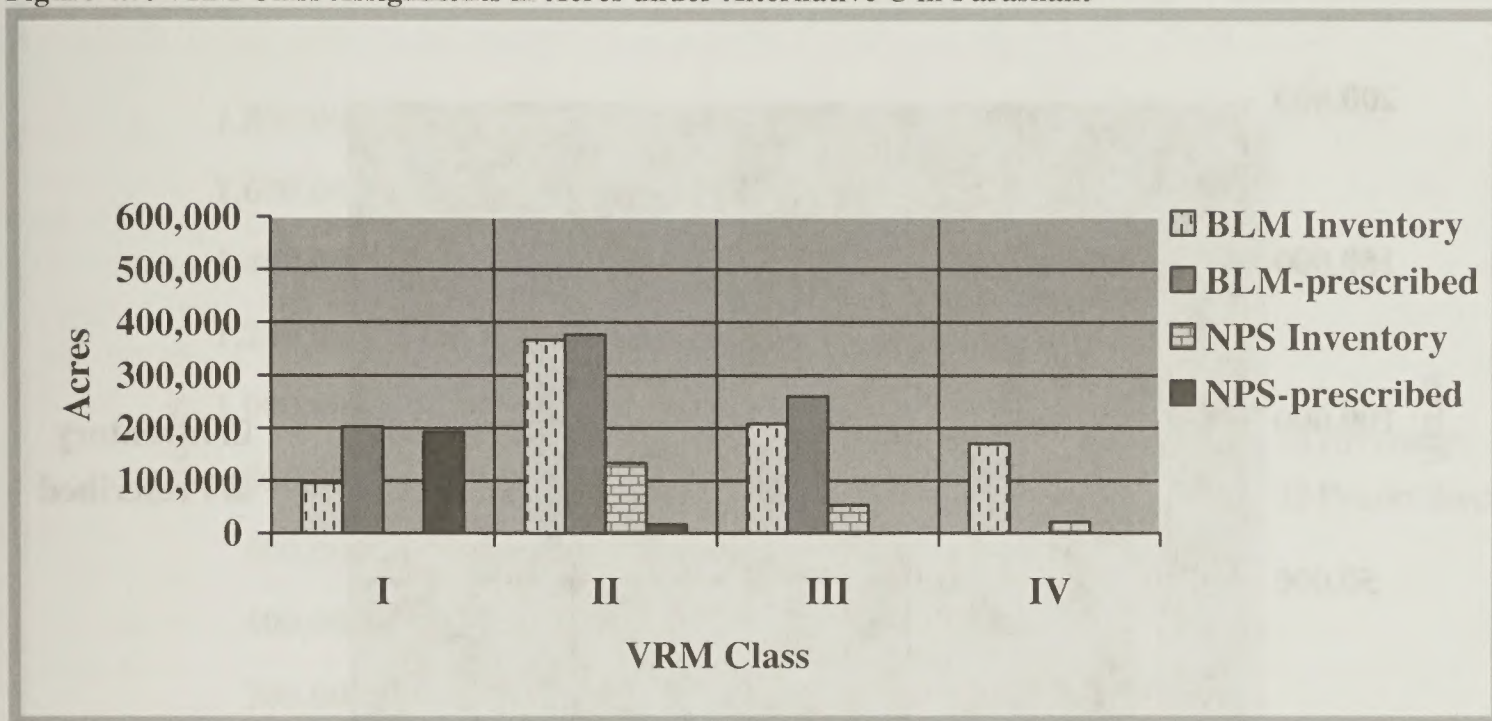
Impacts from Visual Resources Management

Impacts from future Congressional designations of wilderness or wild and scenic rivers would be the same as described under Alternative A. Impacts from prohibiting activities that could not be mitigated to achieve long-term visual objective(s) and from the use of the VRM contrast rating process would be the same as described under Alternative A. Allowing research/restoration actions that would be allowed to exceed VRM objectives would have the same short-term effects as described under Alternative B. Under Alternative C, the requirement that new facilities not attract attention at night would directly contribute to maintaining current night sky conditions in the short-term and moderately reducing the potential for new artificial light sources in the long-term. Additionally, night sky conditions could moderately improve over the long-term through direct mitigation of existing artificial light sources in the Monument.

How impacts to each of the three planning areas relating to specific VRM class assignments under Alternative C compare to Alternative A and/or B are presented below:

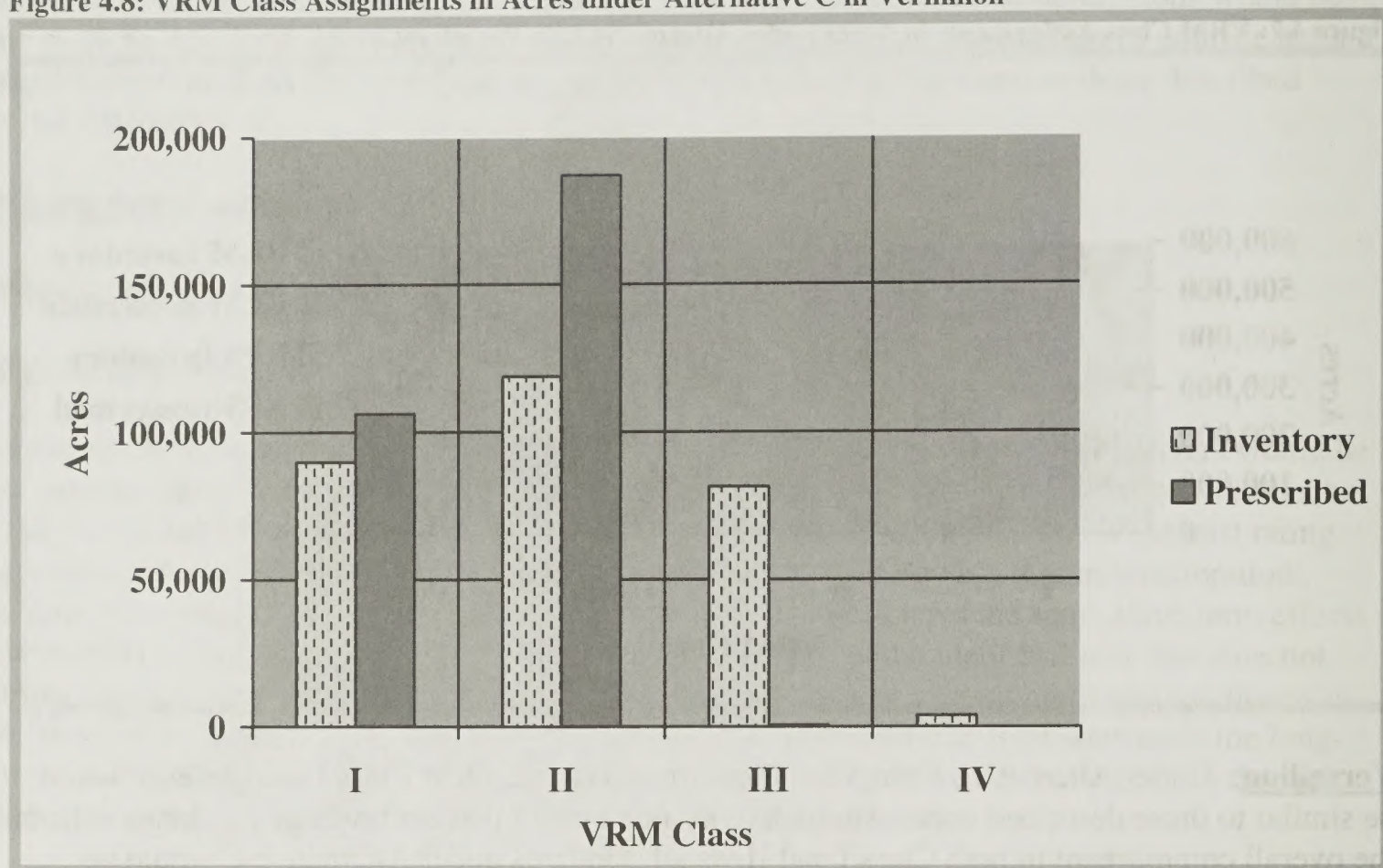
Parashant: Impacts from assigning VRM Class I under Alternative C would be similar to that Alternative B, although slightly reduced due to 15 percent fewer acres being assigned in Parashant. The types of impacts to visual resources and their availability for viewing by the public would be the same as described under Alternative B; however, the overall commitment to both Class I and II visual standards under Alternative C would cover 25 percent fewer acres than proposed under Alternative B and 78 percent more than proposed under Alternative A. As Figure 4.7 demonstrates, 32 percent more lands would be assigned to Class I and II than the VRI determined to be present. Due to the nature of the Class III objectives, existing visual resources and viewing opportunities could be affected in the short-term by management practices that have the potential to create contrast, such as certain types of vegetation treatments. Impacts would be direct and range from minor to moderate.

Figure 4.7: VRM Class Assignments in Acres under Alternative C in Parashant



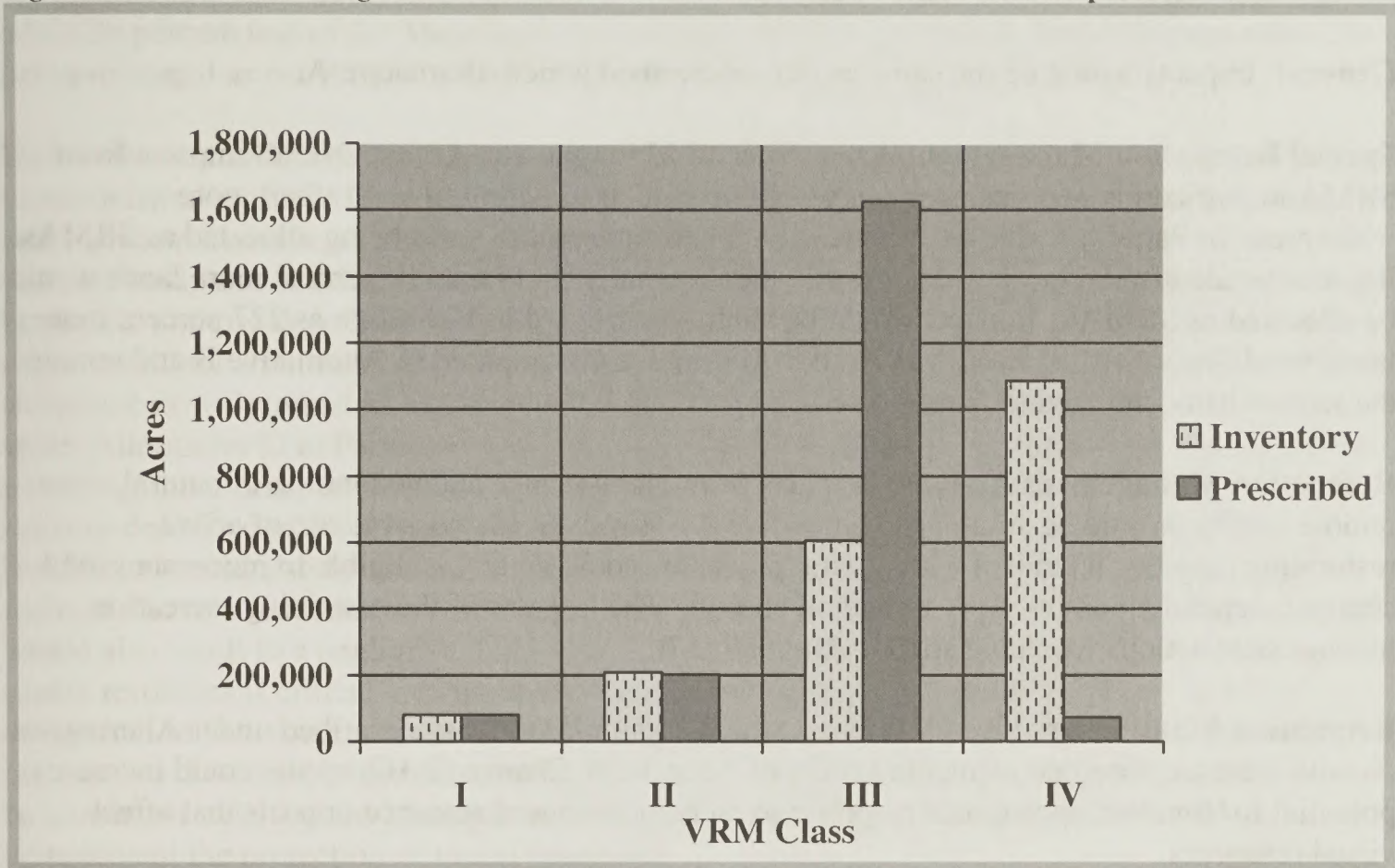
Vermilion: Under Alternative C for Vermilion, impacts from VRM Class I assignments would be similar to those described under Alternative B, albeit on 17 percent fewer acres. Impacts from the overall commitment to both Class I and II visual standards under Alternative C would be similar to Alternatives A and B as only one percent fewer acres would be covered, which would represent 41 percent more than the VRI determined to be present (see Figure 4.8).

Figure 4.8: VRM Class Assignments in Acres under Alternative C in Vermilion



Arizona Strip FO: The commitment of 80,760 acres to Class I would represent about the same acreage that was inventoried and three percent less than Alternative A (see Figure 4.9). The commitment of 202,092 acres to a Class II VRM standard would represent three percent less than the inventoried Class II lands and a 65% decrease from Alternative A. The commitment of 1,625,409 acres to a Class III VRM standard would represent a 168% increase over the inventoried Class III lands and a 334% increase from Alternative A. The effects of a Class IV standard would be the same as Arizona Strip Alternative B.

Figure 4.9: VRM Class Assignments in Acres under Alternative C in the Arizona Strip FO



Impacts from Cultural Resources

Overall impacts would be the same as those described under Alternative A.

Impacts from Special Area Designation (Wilderness)

Impacts would be the same as those described under Alternative B.

Impacts from Livestock Grazing

Overall impacts would be similar to those described under Alternative A, although some improvement in visual quality would occur on 8 percent more acres that would be closed from livestock grazing and 102,300 additional acres that would receive seasonal restrictions in Parashant. In the Arizona Strip FO, impacts could occur on 0 acres closed for grazing under Alternative A, although seasonal restrictions would limit impacts on 216,950 acres. Impacts in Vermilion would be the same as described under Alternative A.

Impacts from Recreation and Visitor Services

General: Impacts would be the same as those described under Alternative A.

Special Recreation Management Areas/Special Management Areas: Overall impacts from SRMA identification and management would be similar to Alternative A, albeit more widespread in Parashant due to over two and a half times more acres being allocated as SRMAs. Impacts would also be more widespread in the Arizona Strip FO, as 19 percent more lands would be allocated as SRMAs. Impacts would be slightly increased in Vermilion as 227 percent more lands would be identified as SRMAs under Alternative C compared to Alternative B and remain the same when compared to Alternative A.

Recreation Management Actions: Impacts from maintenance and restoration of natural, remote settings would be similar to Alternative A. However, the possible use of active restoration projects in tandem with natural processes could create negligible to moderate visual contrast, depending on the type of method chosen. The impacts of the remaining recreation management actions would be similar Alternative B.

Recreation Monitoring: Overall impacts would be similar to those described under Alternative A, with the exception that using the Limits of Acceptable Change (LAC) model could increase potential for timelier, appropriate response to recreation-caused resource impacts that affect visual resources.

Recreation Marketing: Impacts would be the same as those described under Alternative B.

Recreation Administration: Overall impacts would be the same as those described under Alternative A, with the exception that possible extensions beyond the 14-day camping limit could slightly increase impacts.

Impacts from Lands and Realty

Impacts would essentially be the same as those described under Alternative A for Parashant and the Arizona Strip FO, but similar to Alternative B for Vermilion.

Alternative DImpacts from Trails and Travel Management/Transportation Facilities

Impacts from OHV closed area designations and prohibitions on new road construction in the Monuments would be similar to those described in Alternative A. In Vermilion and the Arizona Strip FO, the types of impacts to visual resources from the management of TMAs would be similar to those described under Alternative C due to similar allocations (+/- 1%). In Parashant, 20 percent more lands would experience minor to moderate impacts related to being managed as

the Specialized TMA compared to Alternative B (5 percent more compared to Alternative C), while 20 percent less of the Monument would experience negligible to minor impacts related to being managed as the Primitive TMA (5 percent less compared to Alternative C).

Under Alternative D, the combined total of 1,616 miles of roads proposed open to the public and to administrative use in Parashant and 463 miles in Vermilion would be a 6 percent reduction and 1 percent increase, respectively, compared to Alternative A. This would represent an increase compared to Alternatives B and C. Long-term impacts from travel on these roads would be similar to those described under Alternative A, albeit slightly reduced. Impacts from route closures and rehabilitation would be similar to those described under Alternative B, although not as intense or widespread as less than one-third (36 percent) as many routes would be closed under Alternative D in Parashant and less than a half in Vermilion. Impacts from actions such as rerouting, monitoring the creation of unauthorized routes and closing those found, would be the same as described under Alternative A. Impacts from intermittent dust and to night sky conditions would also be similar to those described under Alternative A, although somewhat reduced due to a reduction in roads open to the public compared to Alternative A. The reduction would also result in a negligible, long-term impact to the public's opportunity to view some scenic resources if critical viewing routes are closed. The impacts from restricting travel to designated routes, route maintenance actions, and existing and new road material sites would be the same as described under Alternative A, with the exception that route upgrades would have to be consistent with desired Management Unit goals and TMA objectives, which would complement the protection of visual resources.

Impacts in the Arizona Strip FO from implementing Alternative D would differ from the Monuments in the following ways:

- The effects of the designated trails and travel management system for the Littlefield and Ferry Swale Sub-regions would occur on 439 miles of open public roads, 50 miles of administrative use only roads, and 40 miles of open for non-motorized/non-mechanized use; the combined total of 529 miles perpetuate the types of visual influences already described in Alternative A, only on 2% fewer miles.
- The visual impacts of actions related to closed routes would take place on 31 miles closed and rehabilitated in the Littlefield and Ferry Swale Sub-regions, or a 55% increase from Alternative A.
- The impacts related to intermittent dust, night sky conditions, and viewing opportunities described in Parashant Alternative B would be similar in the Littlefield and Ferry Swale Sub-regions, though attributable to 11% fewer open public roads than Alternative A.
- Use of the 7,186-acre Open OHV area designations (385% larger than proposed under Alternative C) and the case-by-case consideration of motorized speed events anywhere in the Arizona Strip could impact visual resources with minor to major amounts of airborne dust on a short-term, localized basis. The Open OHV areas could result in moderate visual contrast over the long-term as unlimited off-road use creates new routes.

- The potential effects of a designated trails and travel management system for the St. George Basin Sub-region could occur on up to 520 miles of open public roads, 40 miles of administrative-use-only roads, and 90 miles of open for non-motorized/non-mechanized use; the combined total of up to 650 miles perpetuate the types of visual influences already described in Alternative A.
- The visual impacts of actions related to closed routes in the St. George Sub-region could take place on up to 50 miles closed and rehabilitated in the sub-region, or a 54% increase from Alternative A.
- The impacts related to intermittent dust, night sky conditions, and viewing opportunities described in Parashant Alternative B could be similar in St. George Basin, though attributable to 2% fewer open public roads from Alternative A.
- The effects of a 'preliminary route network' pending future route designation decisions for applicable sub-regions would be similar to Alternative B, however, for those sub-regions or parts of sub-regions that would be within a 'limited to existing roads and trails' OHV area designation, the impacts to visual resources would be similar to those described in Parashant Alternative A.

Impacts from Wilderness Characteristics

Overall impacts would essentially be the same as those described in Alternative B for Parashant and Arizona Strip FO, albeit less widespread as, under Alternative D, complementary management relating to wilderness characteristics would occur on 66 percent less acres. Similar to Alternative A, no areas with wilderness characteristics are proposed for management in Vermilion under Alternative D. There would be 20 percent less acres proposed in Arizona Strip FO under Alternative D than Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Localized impacts to visual resources from restoration and vegetative treatment methods would be the same as those described in Alternative A. However, impacts would be less widespread under Alternative D, as only 20 percent of Parashant, 22 percent of the Arizona Strip FO, and 31 percent of Vermilion could be treated, which would be a major reduction in potential impacts compared to Alternative A (under which the entire Monument could be treated), but would pose a greater potential for impacts compared to Alternative B and C. Impacts from treating 20-31 percent of the three planning areas would be long-term and widespread, as some treatments would be conducted in all ecological zones. Under Alternative D, impacts due to restrictions on chaining and other methods that cause substantial surface disturbance in VRM Class I and II areas would be the same as described under Alternative A. Potential impacts to public opportunities to view some scenic resources due to possible seasonal restrictions, temporary reductions, or elimination of authorized activities in some vegetation treatment areas would be the same as Alternative A. Impacts from restoration activities at Pakoon Springs would be similar to those described under Alternative C. In addition, developing the site for interpretation would moderately enhance public opportunities for viewing riparian scenery. While a

campground/picnic area would further enhance such viewing opportunities, facility development to accomplish that aim could produce direct, localized, and minor to moderate visual contrast that may not meet VRM Class II objectives. Impacts from the continuation of grazing and the installation of fencing around upper Cane Spring would be similar to those described under Alternative A.

Potential impacts from fire-related ecological restoration activities on Mt. Trumbull would be the same as described under Alternative B. However, the “falling and bucking” of smaller diameter trees and brush adjacent to old growth trees would produce localized, short-term visual contrast that would not meet VRM Class I objectives. Initial and repetitive burning of treatment areas would consume felled trees and stumpage, reducing the visual contrast to meet Class I objectives over the long term. Impacts to night sky conditions from operating large fire management camps would be the same as Alternative A. Impacts from minimum impact suppression tactics and minimum tool policy for fire operations in wilderness and NPS-proposed wilderness areas would be the same as described under Alternative A, as would impacts from prevention and mitigation programs and from wildland fires, prescribed fires, and post fire rehabilitation efforts.

Impacts to visual resources from noxious weed prevention/elimination would be the same as described under Alternative A, as would research/restoration-related use of vegetative materials, but only on the acres described above for restoration treatments. Impacts from using non-motorized hand tools to remove invasive weeds along the Paria River would be the same as described under Alternative B.

Impacts from Air, Water, and Soil

Impacts would be the same as those described under Alternative B.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative C, with the exception that the reduction in public access for hunting and wildlife viewing opportunities would not be as great when compared to Alternative A.

Impacts from Special Status Species

Impacts would essentially be the same as those described in Alternative A.

Impacts from Visual Resources

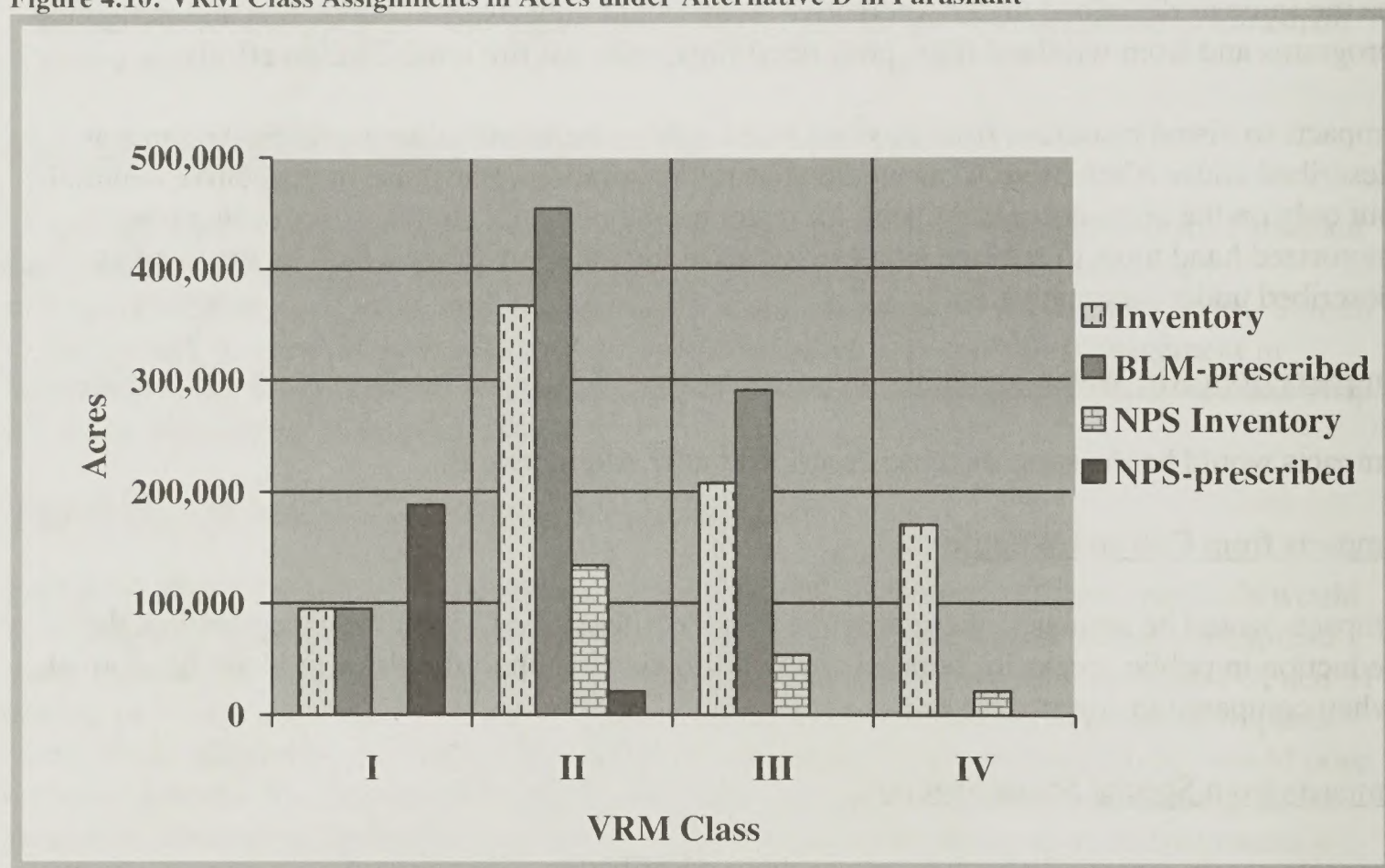
Impacts from future Congressional designations of wilderness or wild and scenic rivers would be the same as described under Alternative A. The effects of prohibiting activities that could not be mitigated to achieve long-term visual objective(s) and the use of the VRM contrast rating process would be the same as described under Alternative A. Impacts research/restoration actions that

would be allowed to exceed onsite VRM objectives would have the same short-term effects described under Alternative B. Impacts to night sky conditions would essentially be the same as those described under Alternative C.

How impacts to each of the three planning areas relating to specific VRM class assignments under Alternative D compare to the previous alternatives is presented below:

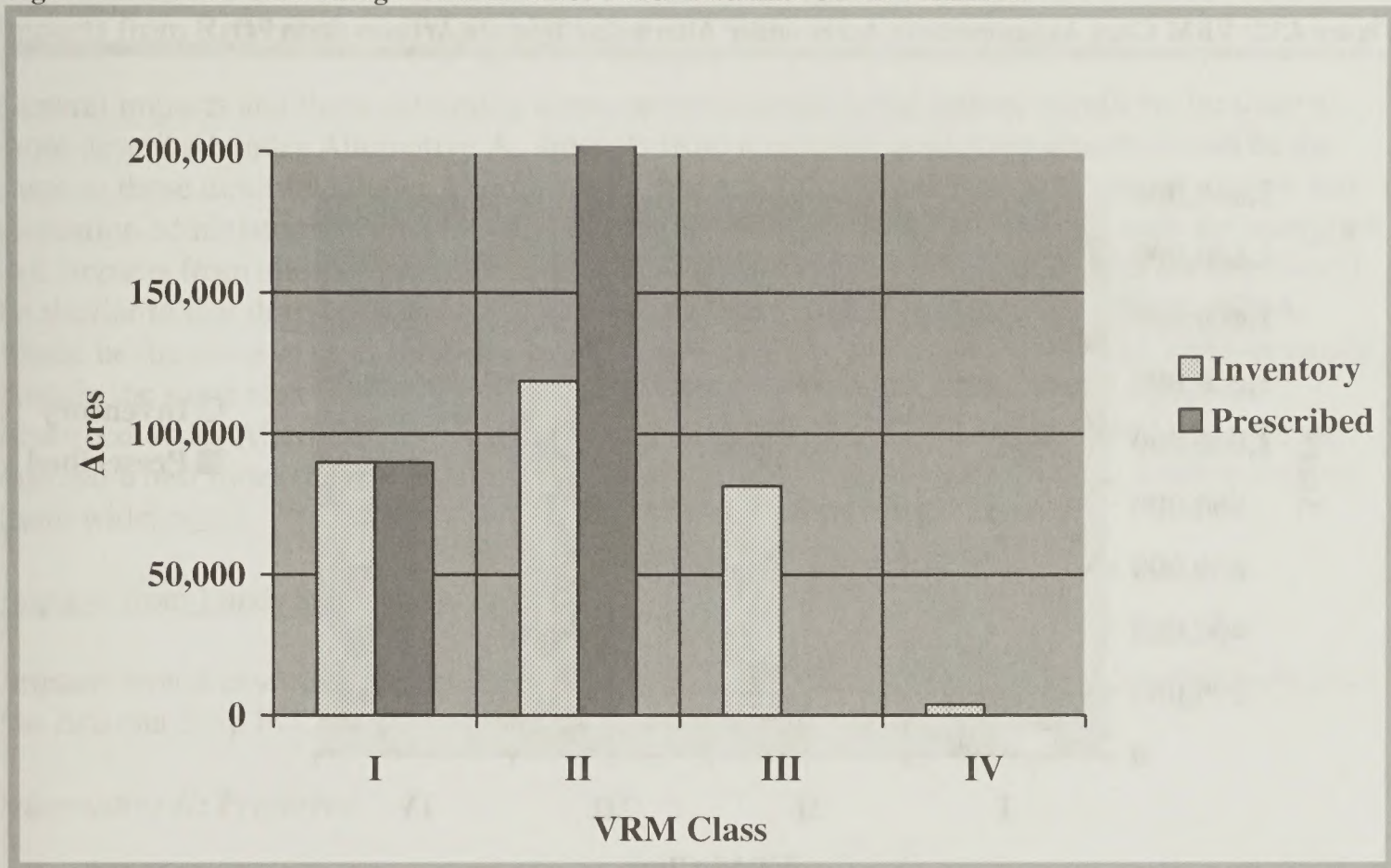
Parashant: Under Alternative D, the types of impacts to visual resources from VRM Class I assignments would be similar to that described under Alternative B and C, but on 60 percent and 53 percent fewer acres respectively. The overall commitment to both Class I and II visual standards on under Alternative D would be 28 percent less than proposed under Alternative B, 27 more than the VRI determined to be present (see Figure 4.10), and 71 percent more than proposed under Alternative A.

Figure 4.10: VRM Class Assignments in Acres under Alternative D in Parashant



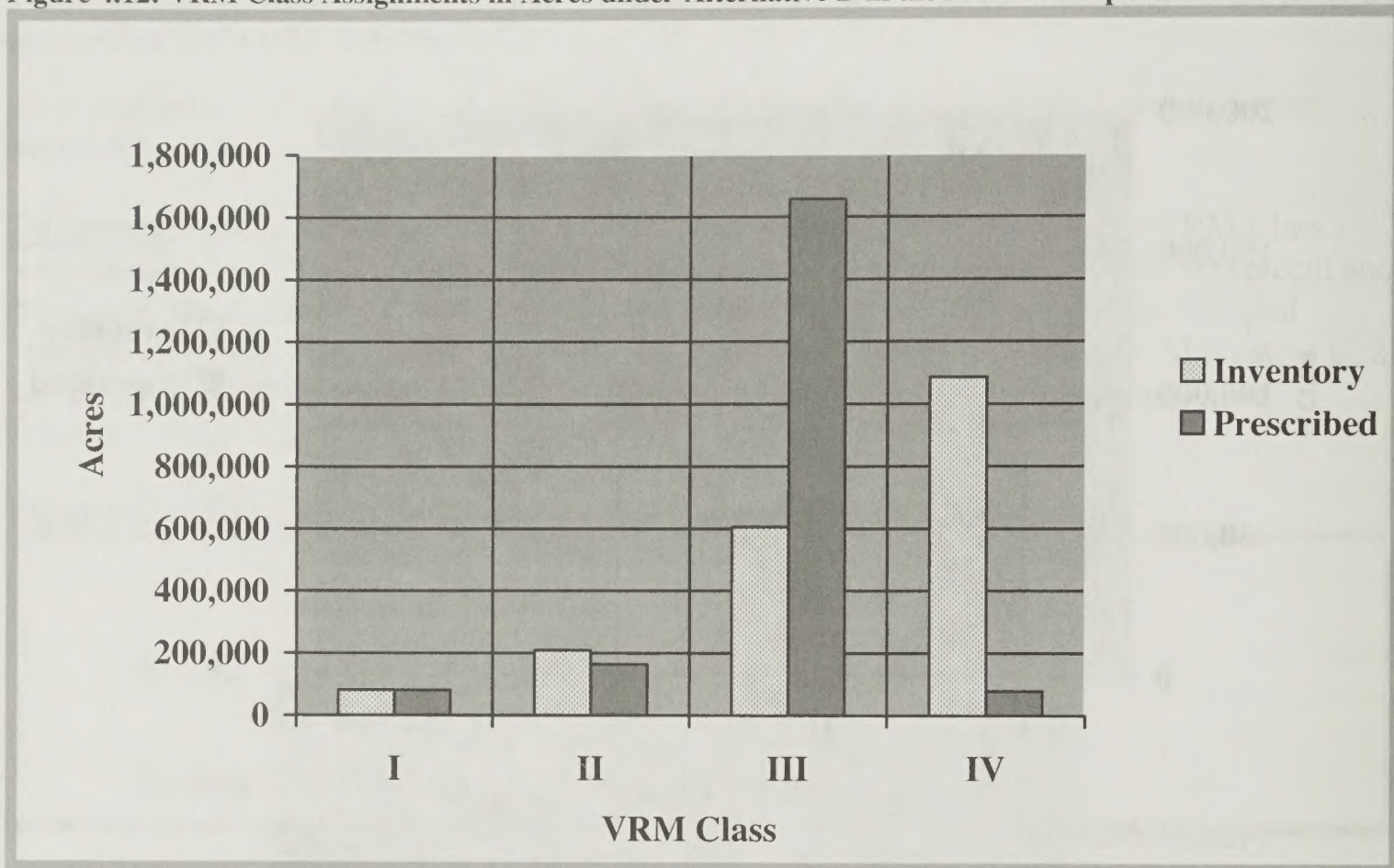
Vermilion: Impacts would essentially be the same as those described under Alternative A, with the exception that assigning 12 total acres at various existing mineral material sites assigned to VRM Class IV would cause long-term, localized, and moderate visual contrasts. Figure 4.11 illustrates the discrepancies between VRM classes proposed and VRI classes.

Figure 4.11: VRM Class Assignments in Acres under Alternative D in Vermilion



Arizona Strip FO: The effects of a Class I standard would be the same as Arizona Strip Alternative C. The commitment of 164,932 acres to a Class II VRM standard would represent a 21% decrease from the inventoried Class II lands and a 71% decrease from Alternative A. The commitment of 1,656,576 acres to a Class III VRM standard would represent a 173% increase over the inventoried Class III lands and a 342% increase from Alternative A. The commitment of 72,797 acres to a Class IV standard would represent a 93-92% decrease from the inventoried Class IV lands and Alternative A. Figure 4.12 illustrates the discrepancies between VRM classes proposed and VRI classes.

Figure 4.12: VRM Class Assignments in Acres under Alternative D in the Arizona Strip FO



Impacts from Cultural Resources

Overall impacts would be the same as those described under Alternative A

Impacts from Special Area Designation (Wilderness)

Impacts would essentially be the same as those described under Alternative B. However, active restoration efforts could create minor, short-term visual change, depending on the scope and magnitude of the methods used. In the long-term, successful restoration efforts would not be noticeable.

Impacts from Livestock Grazing

Overall impacts would be similar to those described under Alternative A, although some improvement to visual quality would occur on 3 percent more acres that would be closed from livestock grazing in Parashant and 111,983 additional acres that would receive seasonal restrictions. In Vermilion, impacts would be the same as under Alternative C due to the same number of acres closed to grazing and similar number of acres covered by seasonal restrictions. However, in the Arizona Strip FO, there would be 6 percent more acres that would receive seasonal restrictions when compared to Alternative A.

Impacts from Recreation and Visitor Services

General impacts and those stemming from recreation monitoring actions would be the same as those described under Alternative A. Impacts from recreation marketing actions would be the same as those described under Alternative B. Impacts from recreation management actions and recreation administration would be the same as described under Alternative C, with the exception that impacts from allowing the commercial use of horses and pack stock in Paria Canyon would be similar to that described under Alternative A. In Parashant, impacts from SRMAs/SMAs would be the same as described under Alternative C. In Vermilion, the proposed SRMAs would contain the same area as the SRMA of Alternative A, thus resulting in similar impacts as described under Alternative A. In the Arizona Strip FO, proposed SRMAs would cover nearly one and a half times the area compared to Alternative A, which would result in impacts that are more widespread.

Impacts from Lands and Realty

Impacts would essentially be the same as those described under Alternative A for Parashant and the Arizona Strip FO, but similar to Alternative B for Vermilion.

Alternative E: Preferred

Impacts from Trails and Travel Management/Transportation Facilities

Impacts from OHV closed area designations and prohibitions on new road construction would be similar to those described in Alternative A. Impacts from management of TMAs would be similar to those described under Alternative C as TMA designations proposed are only within a 1 percent difference in all three planning areas.

Under Alternative E, impacts from the combined total of roads open to the public and to administrative use in the Monuments would be similar to those described under Alternative C due to similar number of miles. Impacts from route closures and rehabilitation would be similar to those described under Alternative B, although not as intense and widespread as less than half the miles of routes in Parashant and 60 percent in Vermilion would be closed under Alternative E than under Alternative B. Impacts from rerouting and monitoring the creation of unauthorized routes and closing those found would be the same as Alternative A. Impacts from intermittent dust and to night sky conditions would also be similar to those described under Alternative A, although reduced due to a reduction in roads open to the public compared to Alternative A. This reduction would also result in negligible to minor, long-term impacts to public opportunities to view some scenic resources if critical viewing routes are closed. The impacts from restricting travel to designated routes and existing and new road material sites would be similar those described under Alternative A. Impacts from route maintenance/improvement actions would be the similar to those described under Alternative D.

Impacts in the Arizona Strip FO from implementing Alternative D would differ from the Monuments in the following ways:

- The effects of the designated trails and travel management system for the Littlefield and Ferry Swale Sub-regions would occur on 378 miles of open public roads, 96 miles of administrative use only roads, and 40 miles of open for non-motorized/non-mechanized use; the combined total of 514 miles perpetuate the types of visual influences already described in Alternative A, only on 5% fewer miles.
- The visual impacts of actions related to closed routes would take place on 47 miles closed and rehabilitated in the Littlefield and Ferry Swale Sub-regions, or a 135 % increase from Alternative A.
- The impacts related to intermittent dust, night sky conditions, and viewing opportunities described in Parashant Alternative B would be similar in the Littlefield and Ferry Swale Sub-regions, though attributable to 23% fewer open public roads than Alternative A.
- The effects of Open OHV area designations would be the same as Alternative D and the impacts of motorized speed events would be the same as Alternative C.
- The potential effects of a designated trails and travel management system for the St. George Basin Sub-region could occur on up to 520 miles of open public roads, 40 miles of administrative-use-only roads, and 90 miles of open for non-motorized/non-mechanized use; the combined total of up to 650 miles perpetuate the types of visual influences already described in Alternative A.
- The visual impacts of actions related to closed routes in the St. George Sub-region could take place on up to 50 miles closed and rehabilitated in the sub-region, or a 54% decrease from Alternative A.
- The impacts related to intermittent dust, night sky conditions, and viewing opportunities described in Parashant Alternative B could be similar in St. George Basin, though attributable to 2% fewer open public roads from Alternative A.
- The effects of a 'preliminary route network' pending future route designation decisions for applicable sub-region would be similar to Alternative B.

Impacts from Wilderness Characteristics

Overall impacts would be similar to those described in Alternative B, albeit less widespread because complementary management relating to wilderness characteristics under Alternative E would occur on 49 percent less acres in Parashant and 63 percent less acres in Vermilion. There would be 20 percent less acres in Arizona Strip FO under Alternative E than Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative D.

Impacts from Air, Water, and Soil

Impacts would be the same as those described under Alternative B.

Impacts from Fish and Wildlife

Overall impacts would be most similar to those described under Alternative C.

Impacts from Special Status Species

Impacts would essentially be the same as those described in Alternative A.

Impacts from Visual Resources

Impacts from future Congressional designations of wilderness or wild and scenic rivers would be the same as described under Alternative A. The effects of prohibiting activities that could not be mitigated to achieve long-term visual objective(s) and the use of the VRM contrast rating process would be the same as described under Alternative A. Impacts from research/restoration actions that would be allowed to exceed VRM objectives would have the same short-term effects described under Alternative B. Impacts to night sky conditions would essentially be the same as those described under Alternative C.

Impacts from VRM Class assignments in Parashant would be essentially the same as those described under Alternative C, except that they would apply to 107,216 fewer VRM Class I acres and 80,581 more VRM Class II acres. Impacts from VRM Class assignment in Vermilion under Alternative E would be the same as those described under Alternative D due to the same allocations. In the Arizona Strip FO, the effects of a Class I standard would be the same as under Alternative C, while the effects of a Class IV standard would be the same as Arizona Strip Alternative D. The commitment of 322,106 acres to a Class II VRM standard would represent a 54% increase from the inventoried Class II lands and a 44% decrease from Alternative A. The commitment of 1,499,401 acres to a Class III VRM standard would represent a 147% increase over the inventoried Class III lands and a 300% increase from Alternative A.

Impacts from Cultural Resources

Overall impacts would be the same as those described under Alternative A

Impacts from Special Area Designation (Wilderness)

Impacts would be the same as those described in Alternative D.

Impacts from Livestock Grazing

Overall impacts would be the similar to those described under Alternative C in Parashant, Alternative B in Vermilion, and Alternative A in the Arizona Strip FO.

Impacts from Recreation and Visitor Services/Interpretation and Environmental Education

General impacts would be the same as described under Alternative A, while impacts from recreation marketing actions would be the same as described under Alternative B. Impacts from recreation management, monitoring, and administration actions would be similar to that described under Alternative C, while impacts from SRMAs/SMAAs would be the same as described under Alternative D..

Impacts from Lands and Realty

Impacts would essentially be the same as those described under Alternative A for Parashant and the Arizona Strip FO, but similar to Alternative B for Vermilion.

Cumulative Impacts

The geographic area for analysis of cumulative impacts to visual resources is northern Arizona, southwestern Utah, and southeastern Nevada. Over time, continued population growth of the large and small communities in this area would erode natural night sky conditions in the Planning Area. During the life of the Plan, the development of large blocks of Arizona State Trust lands for residential, commercial, urban, and other community expansion purposes would shift much of the recreation use that currently takes place on those lands to adjacent public lands. Such a shift would produce an increase in the creation of illegal routes and fugitive dust that would noticeably change the visual character of affected public lands.

The growing need to decrease the potential for catastrophic fire in the region through mechanical treatments aimed at reducing fuel loads would gradually alter landscapes where treatments are conducted. Smoke from prescribed fires used for the same purpose would sporadically affect the quality of viewsheds and interfere with the public's viewing of scenery. The potential for noxious weed invasions in the region to change existing landscape form, texture, and color over large areas in a relatively short time would continue to increase.

Extended drought conditions combined with construction activities (related to urban growth) and increased use of dirt roads in the region (related to the growing numbers of visitors) would contribute to more frequent and prolonged periods of fugitive dust, which would affected the quality of visual resources. Conversely, diligent application of Standards for Rangeland Health, the maintenance of Vital Sign resources on NPS lands, reclamation practices, restoration projects, and the progression toward achieving desired future conditions for vegetation management would noticeably reduce the potential for fine soil particles to become airborne.

Such practices would, if successful, improve scenic quality on sites that historically have been compromised.

Continued application of visual resource design principles for permitted projects, activities, and uses on public lands would do much to maintain visual resources within the Planning Area. A shift toward renewed uranium exploration and extraction would create visual contrasts in non-Monument areas. As some shifting in the region occurs from agricultural-related businesses to recreation and tourism, some landscapes would be visually enhanced by the removal of unneeded structures. However, such a shift would create other impacts to visual resources by providing for more structured recreation, accompanied by increased visitation. Management of areas such as wilderness, proposed wilderness, areas having wilderness characteristics, and various ACECs would contribute to maintaining or enhancing landscape conditions on scattered, large tracts of public land.

WILDERNESS CHARACTERISTICS

This section presents potential impacts from the proposed alternatives to areas allocated for maintaining wilderness characteristics. Analyzed are management actions that either enhance or diminish those characteristics most often associated with wilderness (i.e., solitude, naturalness, and outstanding opportunities for primitive and unconfined recreation). In the Planning Area, these characteristics are primarily influenced by the number and proximity of motorized travel corridors, the volume and type of traffic on those corridors, and the quantity and type of recreational users. Noise from motorized travel can degrade solitude, motorized intrusions can cause surface disturbances that impact naturalness, and both types of impacts can reduce opportunities for primitive and unconfined recreation. To a lesser extent, range and wildlife management projects can affect areas with wilderness characteristics. These impacts normally come from vegetation treatments and the installation, maintenance, and use of range/wildlife catchments and wildlife “drinkers” (i.e., manmade water sources).

The plan alternatives provide a wide range of acreage combinations that are proposed for maintaining wilderness characteristics (Table: 2.10). In order to provide an appropriate array of management alternatives for wilderness characteristics, an objective scoring criteria (Appendix: 3.D) was developed to prioritize areas that, early in the planning process, had been assessed and found to have all three wilderness characteristics (i.e., solitude, naturalness, and outstanding opportunities for primitive and unconfined recreation). Each area that had been assessed and found to have the three characteristics was scored on three criteria: the value of the characteristics (e.g., condition, uniqueness, relevance, and importance); the need (i.e., trend and risk) for that particular area, given existing and future tendencies; and whether the area was practical to manage for maintenance of the wilderness characteristics.

Methods and Assumptions

The analysis of potential impacts to wilderness characteristics is based on visitor use reporting statistics from the Arizona Strip FO and the Recreation Management Information System (RMIS), which provide information on the number and types of recreational use within areas containing wilderness characteristics, and on the wilderness characteristics assessments, which were conducted between April 2002 and May 2004. The assessments provide boundary data, as well as narrative information on type and quality of areas with wilderness characteristics. Spatial/GIS information was also used in this analysis, such as wildlife habitat boundaries, range and wildlife developments, wilderness characteristic boundaries, transportation inventory, transportation designations, ecological zones, vegetation types, and known historical/cultural sites. In the absence of data, analyses were based on the knowledge base of local recreation/wilderness planners. All areas referenced as containing wilderness characteristics have been assessed and shown to possess all three wilderness characteristics.

Impacts are quantified where possible. In the absence of quantifiable data, professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. Impacts to each of the three wilderness characteristics can be quite different. For instance, naturalness, solitude, and opportunities for primitive/unconfined recreation can all be impacted by surface disturbing activities; but only solitude and opportunities for primitive/unconfined recreation can be impacted when no surface disturbance is present. Despite these differences, the intensities of impacts to each wilderness characteristic can be described using the following guidance:

- Negligible: The impact is at the lower level of detection; there would be no measurable change.
- Minor: The impact is slight but detectable; there would be a small change.
- Moderate: The impact is readily apparent; there would be a measurable change that could result in a small but permanent change.
- Major: The impact is severe; there would be a highly noticeable, long-term, or permanent measurable change.

The following assumptions regarding the future management of lands allocated to maintain wilderness characteristics are made:

- All guidelines for the management and maintenance of wilderness characteristics, as identified in this document would be followed, to the extent allowed by existing budget and available personnel.
- Any new surface disturbing activities proposed would be subject to NEPA analysis.

- Activities proposed that would not initially meet wilderness characteristic objectives for the area would be mitigated to the extent needed to meet the objectives. Activities that could not be mitigated would not be authorized.

Impacts to Wilderness Characteristics

Impacts to areas allocated to maintain wilderness characteristics would result from actions proposed by the following resource management programs:

- Trails and Travel Management
- Wilderness Characteristics
- Vegetation Management
- Fish and Wildlife
- Special Status Species
- Visual Resources
- Cultural Resources
- Livestock Grazing
- Recreation
- Lands and Realty

Alternative A: No Action

Under Alternative A, no allocation to maintain wilderness characteristics is made nor can be made. The current management plan (No Action) makes no provision for managing or maintaining these characteristics because it (the plan) predates the agency policy that created the wilderness characteristics allocation. Therefore, it must be noted that Alternative A describes impacts to the “supply” or “inventory” of assessed wilderness characteristics and the potential effects from the absence of a management allocation. Alternatives B through E evaluate the effects of plan alternatives on both the “supply” and the allocated acreage for each alternative.

Impacts from Trails and Travel Management

Under Alternative A, no routes would be closed in the Planning Area. In addition, 637 miles of routes in Parashant, 280 miles in Vermilion, and 430 miles in the Arizona Strip FO that run parallel to or are located within the wilderness characteristics “supply” would be potentially open to motorized and mechanized vehicle use by the public. These routes could have a moderate impact on the wilderness characteristics “supply”, as vehicle traffic could degrade solitude, naturalness, and opportunities for primitive/unconfined recreation. The effects would be direct and long-term. While the remote nature of much of the Planning Area would forestall these effects in the short-term, over time there could be a general eroding of the quality of such characteristics.

The majority of the wilderness characteristics “supply” in Vermilion is on the Paria Plateau, with the remainder found in the Ferry Swale area. Both areas consist of rolling, sandy terrain, and quite often, a route or road defines the edge of the wilderness characteristics “supply.” Because of the deep sand throughout the area, these routes are poor impediments to motorized intrusion, particularly from OHV traffic. This vulnerability places the wilderness characteristics “supply” in these areas at a higher risk for the impacts described above.

Impacts from Wilderness Characteristics

Field assessments conducted as part of the planning process determined that the “supply” of wilderness characteristics in the Planning Area is as follows: 437,430 acres in Parashant, 95,876 acres in Vermilion, and 157,412 acres in the Arizona Strip FO. As previously stated, under Alternative A, none of these lands would be allocated to maintain wilderness characteristics. Therefore, no proactive management to maintain wilderness characteristics would be undertaken, which would allow all of the “supply” to be effected by other resource impacts as identified throughout this section. Alternative A, therefore, proactively maintains the least (none) amount of the “supply” among the alternatives.

Impacts from Vegetation Management

The wilderness characteristics “supply” makes up 42 percent of the total acreage of Parashant, 33 percent of Vermilion, and eight percent of the Arizona Strip FO. Under Alternative A, vegetation treatments could have minor to moderate, localized impacts on that “supply” because no allocation for wilderness characteristics is made whereby such treatments could be mitigated or disallowed based on a maintenance-of-wilderness-characteristics emphasis. These impacts could be short-term and direct, reducing solitude, naturalness, and opportunities for primitive/unconfined recreation, depending on the type and scope of work being performed.

Impacts from Fish and Wildlife

Wildlife Habitat Improvement Projects: Twenty-two wildlife drinkers located within the wilderness characteristics “supply” in Parashant would remain in place under Alternative A. These serve wildlife populations throughout the Monument. On NPS lands, four existing water features would remain as part of the cultural landscape. No such drinkers are located within the wilderness characteristics “supply” in Vermilion or the Arizona Strip FO. Motorized access to the existing drinkers in Parashant would continue for maintenance purposes, which could have minor impacts on the “supply” with regard to opportunities for solitude and naturalness. New drinkers and other wildlife developments could potentially be developed on BLM lands in all three planning areas. The construction and maintenance of any future wildlife developments could have minor impacts on the “supply” because no allocation for wilderness characteristics is made whereby such projects could be mitigated or disallowed based on a maintenance-of-wilderness-characteristics emphasis. Naturalness and opportunities for solitude could be effected by the addition and motorized use of new routes and structures. However, such facilities, in so

far as they would cultivate sustainable, viable wildlife populations over time, could enhance wildlife components of naturalness and opportunities for certain primitive types of recreation. Impacts would be direct, localized, and minor.

Vegetation Treatment Projects for Wildlife: Maintaining existing treatments and initiating new treatments to meet vegetation DFCs could affect the wilderness characteristics “supply” because no allocation for wilderness characteristics is made whereby such projects could be mitigated or disallowed based on a maintenance-of-wilderness-characteristics emphasis. Solitude and naturalness could experience short-term impacts while work was being conducted. Long-term impacts would depend on the size and scope of the project.

Restoration of Native Wildlife Populations: There could be a temporary loss of solitude during release operations for bighorn sheep and other species in the wilderness characteristics “supply.” These impacts would be minor and localized and would be offset by enhanced opportunities for wildlife viewing in the long term.

Impacts from Special Status Species

Under Alternative A, special status species management actions for fire suppression, grazing, species reintroduction, vegetation management, and recreation could all impact the wilderness characteristics “supply”, depending on the type and scope of the project proposed. In order to protect special status species, such actions generally rely on minimum surface disturbance, which would result in direct, localized, and negligible to minor impacts to the wilderness characteristics “supply.”

Impacts from Visual Resources

In Parashant, VRM Class III or IV allocations would overlap 229,307 acres of the wilderness characteristics “supply”, while VRM Classes I or II allocations would overlap 203,014 acres. In Arizona Strip FO, VRM Class III or IV allocations would overlap 70,195 acres of the wilderness characteristics “supply”, while VRM Classes I or II allocations would overlap 87,215 acres. VRM Class III and IV would allow for greater landscape modification, via projects such as vegetation treatments, communications towers, and range developments, than VRM Class I and II. This places approximately half of the wilderness characteristics “supply” in Parashant and the Arizona Strip FO at greater risk of diminished naturalness or opportunities for solitude and primitive/unconfined recreation because no allocation for wilderness characteristics is made whereby such landscape change could be mitigated or disallowed based on a maintenance-of-wilderness-characteristics emphasis. Impacts would be direct and long-term and, depending on what projects are proposed, could range from minor to major, with the potential to effectively eliminate wilderness characteristics “supply” in some areas.

VRM Class I or II allocations would overlap all of the wilderness characteristics “supply” in Vermilion (95,876 acres) under Alternative A. VRM Class I and II would be aimed at greater

preservation or retention of existing landscape character than VRM Class III and IV. In mitigating, restricting or even prohibiting landscape-altering developments or projects, management of VRM Class I and II allocations could indirectly contribute to sustaining the “supply” of naturalness and opportunities for solitude and primitive/unconfined recreation. For those projects that would be allowed in VRM Class I or II allocations, the impacts to the wilderness characteristics “supply” would be dependent on the type of project, but would be expected to be direct, localized, and range from negligible to minor.

Impacts from Cultural Resources

Under Alternative A, four existing public use sites are located within one-quarter mile of the wilderness characteristics “supply” in Parashant. Two existing public use sites in Vermilion and five in the Arizona Strip FO are adjacent to, or fall within the “supply.” Increased visitor use of cultural public use sites could indirectly impact existing opportunities for solitude in or near the wilderness characteristics “supply.” However, given existing location and terrain, impacts of the existing public use sites to the wilderness characteristics “supply” would be localized and negligible to minor.

Cultural field inventories proposed in Parashant could have a temporary short-term impact on existing solitude and primitive/unconfined recreation opportunities because no allocation for wilderness characteristics is made whereby such projects could be mitigated or disallowed based on a maintenance-of-wilderness-characteristics emphasis. There could be a longer-term effect on existing naturalness, depending on the extent of the inventories. Impacts would be direct, localized, and minor.

In the Arizona Strip FO, the existing Lost Spring Mountain, Virgin Slope, and Beaver Dam Slope ACEC designations overlap, in varying amounts, portions of the wilderness characteristics “supply.” ACEC designation and its accompanying management prescriptions could indirectly contribute to sustaining the wilderness characteristics “supply.”

Impacts from Livestock Grazing

Livestock grazing could affect the naturalness “supply” in areas where excessive vegetation utilization and surface disturbance typical of livestock operations in an arid environment occur. The presence of livestock could affect the “supply” of both opportunities for solitude and primitive/unconfined recreation as users seeking these types of experiences may choose to avoid areas where cattle are present. In general, grazing impacts to the wilderness characteristics “supply” could be direct, localized, seasonal, and range from minor to moderate, depending on the number of livestock present.

Range Developments: Under Alternative A, 129 range developments in Parashant, 37 in Vermilion, and 47 in the Arizona Strip FO would remain within the wilderness characteristics “supply.” In addition, there would be approximately 140 miles of livestock fence and 30 miles

of pipeline in Parashant, 200 miles of livestock fence and 58 miles of pipeline in Vermilion, and 167 miles of livestock fence and 26 miles of pipeline in the Arizona Strip FO. Motorized access to a majority of these sites for construction and maintenance purposes would be allowed. Such activities and the developments themselves could have minor to moderate impacts on the wilderness characteristics “supply”, as they could diminish naturalness, solitude, and the opportunity for primitive/unconfined recreation in the vicinity. These impacts would be direct, localized, and depending on the development, could affect the surrounding terrain for up to one-half mile in any direction because no allocation for wilderness characteristics is made whereby such impacts could be mitigated or disallowed based on a maintenance-of-wilderness-characteristics emphasis.

Allotment Closures: Under Alternative A, by fully closing all or portions of five allotments in Parashant and seasonally restricting three allotments in the Arizona Strip FO, the reduction or cessation of livestock grazing could indirectly contribute to sustaining the wilderness characteristics “supply” on 61,692 acres. No allotments would be subject to closures or seasonal restrictions in Vermilion, allowing livestock grazing impacts to continue to affect the wilderness characteristics “supply”, as described above.

Impacts from Recreation

Restoration Projects: Restoration projects using natural processes would generally have minimal localized impacts and short-term effects on the existing “supply” of naturalness and opportunities for solitude and primitive/unconfined recreation. Using natural restoration processes could have moderate to major long-term impacts to naturalness, as the ability to control invasive species would likely be ineffective. These impacts would be greatest under Alternative A when compared to the other alternatives.

Geocaching: Impacts to the naturalness “supply” from geocaching could range from negligible soil disturbance in the area immediately surrounding a geocache site, to OHV and four-wheel drive impacts from enthusiasts trying to get as close as possible to a site. In general, these impacts would be direct, localized, and minor. Moderate impacts would be possible at more popular sites, although the remoteness of the Planning Area would make this unlikely.

Signage and Facilities: Minor new facilities (e.g., toilets, information kiosks, directional signs) when placed at trailheads or other high-use areas could indirectly contribute to sustaining the wilderness characteristics “supply.” Visitor education on “Leave No Trace” ethics and area-specific rules and regulations would create better-informed, less-impacting recreational users.

Visitor Limits and Regulations: Establishing visitor limits, supplemental rules, or restriction when monitoring shows a trend towards unacceptable change could indirectly contribute to sustaining the wilderness characteristics “supply”. However, such practices would be based on waiting until areas display degraded conditions and would not allow the flexibility to manipulate use levels based on changing social and/or resource conditions.

Impacts from Lands and Realty

Retention and acquisition of surface ownership lands and sub-surface mineral estates could indirectly contribute to sustaining the wilderness characteristics "supply". Such actions could prevent surface disturbing activities that may degrade the wilderness characteristics "supply."

Alternative B

Impacts from Trails and Travel Management

Under Alternative B, 1,147 miles of routes in Parashant and 345 miles of routes in Vermilion could potentially be closed or seasonally closed to the public (miles are the combination of routes potentially closed to motorized and mechanized vehicle use and routes potentially open to administrative use only.) Of these closures, 637 miles in Parashant and 160 miles in Vermilion run parallel to or are within the wilderness characteristics "supply." In Parashant, 606 miles of routes would potentially be closed or seasonally closed to the public that run parallel to, or are within the proposed Alternative B allocation to maintain wilderness characteristics, while all 637 miles of such routes in Vermilion would potentially be closed or seasonally closed.

Only a small number of routes have been potentially designated in the Arizona Strip FO; all other routes remain open pending route designation. Under Alternative B, 38 miles of routes that run parallel to or are within areas allocated to maintain wilderness characteristics would be potentially closed.

Impacts in the Arizona Strip FO would be minor due to the limited number of miles potentially closed. Potential route closures in the Monuments would have a major impact on areas allocated to maintain wilderness characteristics. Potential large-scale route closures would dramatically reduce vehicle traffic, which would indirectly enhance solitude and naturalness. The effects would be direct and long-term, becoming noticeable as soon as the routes were closed, and over time as potential closed routes were allowed to rehabilitate and eventually blend in with the surrounding landscape. Because of the number of route closures, any negative impacts from open routes to areas allocated to maintain wilderness characteristics would be negligible, and would be significantly less than all other alternatives.

Under Alternative B, the total area available for primitive recreational pursuits would increase significantly. However, because of the limited number of potentially open routes in the Monuments, access to many areas would become more difficult, and when combined with the scarcity of reliable water sources, would render many areas impractical to visit using non-motorized means. Consequently, while Alternative B would enhance solitude and naturalness, it would also reduce outstanding opportunities for primitive, unconfined recreation in the Monument. However, in the Arizona Strip FO, most access routes would be preserved, maintaining primitive recreational opportunities.

Impacts from Wilderness Characteristics

Under Alternative B, 411,256 acres in Parashant and 96,796 acres in Vermilion would be allocated to maintain wilderness characteristics. This represents 94 percent and 100 percent, respectively, of wilderness characteristics “supply” acres, which represents the greatest commitment to active management of wilderness characteristics among the alternatives.

In the Arizona Strip FO, 46,135 acres would be allocated to maintain wilderness characteristics. However, six ACECs proposed for the protection of cultural and wildlife resources have overlapping acreage with wilderness characteristics. Because ACEC management would include maintenance of wilderness characteristics, no further allocation for maintaining wilderness characteristics was necessary. As a result, the commitment to maintaining wilderness characteristics within the subject ACECs was not reflected in the total acres of lands allocated for the maintenance of wilderness characteristics in this alternative. Even so, Alternative B remains the greatest commitment to active management of wilderness characteristics among the alternatives for all three planning areas.

Impacts from Vegetation Management

Under Alternative B, restoration efforts in all ecological zones would be minimal and vegetation treatments would be limited. Any vegetation treatment in areas allocated to maintain wilderness characteristics would have minor, localized impacts only. Recreational users could experience direct, short-term, minor impacts to solitude while the work was being conducted. Naturalness could also experience a similar level of impacts, depending on the type and scope of work.

Impacts from Fish and Wildlife

Impacts from wildlife habitat improvement projects, vegetation treatment projects, and restoration of native wildlife populations would be the same as described under Alternative A for the unallocated wilderness characteristics “supply.” However, for areas allocated to maintain wilderness characteristics under Alternative B, the active management of this allocation would contribute to greater mitigation and/or disallowance of projects that could be hinder or prevent the maintenance of wilderness characteristics.

Impacts from Special Status Species

Impacts would be the same as described under Alternative A for the unallocated wilderness characteristics “supply.” However, for areas allocated to maintain wilderness characteristics under Alternative B, the active management of this allocation would contribute to greater mitigation and/or disallowance of projects that could be hinder or prevent the maintenance of wilderness characteristics.

Impacts from Visual Resources

Impact types would be similar to Alternative A. However, VRM Class I or II allocations would overlap nearly all areas in Parashant and Vermilion and the majority of areas in Arizona Strip FO that would be allocated to maintain wilderness characteristics. The effects of the VRM allocations, in tandem with the direct, active management of a wilderness characteristics allocation versus allowing the indirect contribution of VRM assignments to sustain the wilderness characteristics “supply” would contribute to a greater likelihood of maintaining wilderness characteristics compared to Alternative A.

Impacts from visual resources to wilderness characteristics would be the same as described under Alternative A for the unallocated wilderness characteristics “supply.”

Impacts from Cultural Resources

Overall impacts from public use site designations would be similar to those described under Alternative A, with the exception that one additional public use site in Parashant would be located one-quarter mile from an area of the wilderness characteristics “supply.” While impacts from cultural surveys would be similar to those described under Alternative A, for areas allocated to maintain wilderness characteristics under Alternative B, active management of this allocation would contribute to greater mitigation and/or disallowance of projects that could be hinder or prevent the maintenance of wilderness characteristics.

Several areas to be allocated for wilderness characteristics in the Arizona Strip FO that overlap ACECs would, instead, be directly included in the ACECs as components of relevance and importance. The ensuing proactive management of such ACECs would impact wilderness characteristics to a moderate degree by ensuring the maintenance of their desired future conditions. Impacts from such ACEC/wilderness characteristics combinations would be greatest under Alternative B compared to the other alternatives.

Impacts from Livestock Grazing

Overall impacts from livestock grazing and range developments would be the same as described under Alternative A for the unallocated wilderness characteristics “supply.” However, for areas allocated to maintain wilderness characteristics under Alternative B, the active management of this allocation would contribute to greater mitigation and/or disallowance of projects that could be hinder or prevent the maintenance of wilderness characteristics.

Allotment Closures: Under Alternative B in Parashant, full allotment closures would eliminate livestock grazing impacts on 77,260 acres and partial/seasonal restrictions would reduce impacts on 13,681 acres that would be allocated to maintain wilderness characteristics. Not only is Alternative B more acreage than Alternative A, (29,249 acres more), but the direct, active management of a wilderness characteristics allocation versus allowing the indirect contribution

of allotment closures to sustain the wilderness characteristics “supply” would contribute to greater mitigation of the residual effects of grazing practices.

Impacts from livestock grazing in Vermilion under Alternative B would be the same as those described under Alternative A for the unallocated wilderness characteristics “supply.” However, for areas allocated to maintain wilderness characteristics under Alternative B, the active management of this allocation would contribute to greater mitigation and/or disallowance of projects and practices that could be hinder or prevent the maintenance of wilderness characteristics.

In the Arizona Strip FO under Alternative B, seven allotments would be subject to seasonal restrictions, none of which overlap areas allocated to maintain wilderness characteristics. However, the seasonal restrictions would contribute indirectly to sustaining 32,985 acres of the wilderness characteristics “supply, which is 7,561 more acres than under Alternative A.

Impacts from Recreation

Impacts from restoration projects and signing and facilities would be the same as described under Alternative A for the unallocated wilderness characteristics “supply.” However, for areas allocated to maintain wilderness characteristics under Alternative B, the active management of this allocation would contribute to greater mitigation and/or disallowance of projects that could be hinder or prevent the maintenance of wilderness characteristics.

Geocaching: Removing geocache sites if impacts to resources were observed would have a positive impact on areas allocated to maintain wilderness characteristics as it would reduce or eliminate many of the impacts often associated with geocaching as described under Alternative A. The reduction in impacts would be direct and localized, but would require monitoring to ensure that improvements had long-term effects.

Recreation Marketing Actions: The production of maps, brochures, and other information regarding recreation opportunities would have a positive, moderate, and indirect impact on areas allocated to maintain wilderness characteristics because such publications would allow BLM to educate potential users about specific rules, regulations, and guidelines. The dissemination of such information could also increase user safety in these areas. Such promotional efforts, however, could also increase the number of users and thus affect solitude. Impacts would be direct and could range from minor to moderate.

Visitor Limits and Regulations: Establishing mandatory carrying capacity limits in intensive use areas would reduce or maintain the number of users, would help maintain solitude and naturalness in areas allocated to maintain wilderness characteristics. However, positive impacts would be limited as such practices would be based on waiting until areas displayed degraded conditions and would not allow the flexibility to manipulate use levels based on changing social and/or resource conditions.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A for the unallocated wilderness characteristics "supply." However, for areas allocated to maintain wilderness characteristics under Alternative B, the active management of this allocation would contribute to greater mitigation and/or disallowance of projects that could be hinder or prevent the maintenance of wilderness characteristics.

Alternative C

Impacts from Trails and Travel Management

Under Alternative C, 477 miles of routes in Parashant and 176 miles of routes in Vermilion could potentially be closed or seasonally closed to the public (miles are the combination of routes potentially closed to motorized and mechanized vehicle use and routes potentially open to administrative use only.) Of these closures, 233 miles in Parashant and 83 miles in Vermilion run parallel to or are within the wilderness characteristics "supply." In Parashant, 121 miles of routes would potentially be closed or seasonally closed to the public that run parallel to, or are within the proposed Alternative C allocation to maintain wilderness characteristics, while all 38 miles of such routes in Vermilion would potentially be closed or seasonally closed.

Potential route closures would have a minor to moderate impact on areas allocated to maintain wilderness characteristics. Such closures would reduce vehicle traffic, enhancing solitude and naturalness. The effects would be direct and long-term, becoming noticeable as soon as the routes were closed, and also over time, as closed routes were allowed to rehabilitate and eventually blend in with the surrounding landscape. Potential administrative use only and seasonal closures would benefit solitude, but have little impact on naturalness because roads would continue to be visible. Because the number of potential route closures in this alternative is significantly less than Alternative B, negative impacts to areas allocated to maintain wilderness characteristics could be expected to increase. This could be exacerbated in Vermilion by the number of routes that are cherry-stemmed within areas allocated to maintain wilderness characteristics. However, since the areas affected are quite remote and any routes in proximity receive light traffic only, including the cherry-stemmed routes in Vermilion, impacts to naturalness and solitude would be minor.

Under Alternative C in the Monuments, outstanding opportunities for primitive, unconfined recreation would increase. Potentially closing routes to public motorized and mechanized use would increase the total area available for primitive recreational pursuits. However, unlike Alternative B, where potential route closures and rehabilitation of such routes may render many areas impractical to visit using primitive means, most access routes, though limited to administrative motorized uses, would be preserved under Alternative C, thus protecting primitive recreational opportunities.

Pending route designation, impacts in the Arizona Strip FO would be similar to those described in Alternative B.

Impacts from Wilderness Characteristics

Under Alternative C, 226,394 acres in Parashant and 40,345 acres in Vermilion would be allocated to maintain wilderness characteristics. This represents 52 percent and 42 percent, respectively, of the wilderness characteristics “supply”, which is considerably less of a commitment to maintain wilderness characteristics than Alternative B. In the Arizona Strip FO, 77,575 acres would be allocated to maintain wilderness characteristics. While this is a greater acreage than proposed under Alternative B, the number and size of proposed cultural and wildlife ACECs that could provide the opportunity for overlapping, co-lateral management would be significantly reduced. As a result, Alternative C actually provides a smaller total acreage committed to maintenance of wilderness characteristics than Alternative B, but more than Alternative D.

Impacts from Vegetation Management

Under this alternative, restoration efforts would have a larger scope and could involve a wider range of restoration tools than under Alternative B. Individual impacts from restoration treatments would be similar to Alternative B, but the number and size of treatments would likely increase. Impacts to solitude, naturalness, and opportunities for primitive/unconfined recreation could range from minor to moderate and be short-term, direct, and localized.

Impacts from Fish and Wildlife

Impacts from wildlife habitat improvement projects, vegetation treatment projects, and restoration of native wildlife populations would be the same as described under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts from Visual Resources

Under Alternative C in Parashant, 173,861 acres of areas allocated to maintain wilderness characteristics in the Monument would be assigned to VRM Class I or II. Because these assignments would be aimed at greater preservation or retention of existing landscape character, most developments/disturbances that could affect solitude, naturalness, and primitive/unconfined recreation would be mitigated or not allowed. The remaining 52,391 acres of wilderness characteristics “supply” would lie, unallocated, within lands assigned to VRM Class III, which allows for greater landscape modification. This would risk the possible loss of solitude,

naturalness, or opportunities for primitive/unconfined recreation in the unallocated “supply.” Impacts would be direct, localized, and range from minor to moderate, depending on the type of project.

Impacts in Vermilion and Arizona Strip FO would be the same as described under Alternative B.

Impacts from Cultural Resources

Impacts from cultural resources would be the same as described under Alternative B.

Impacts from Livestock Grazing

Overall impacts from livestock grazing and impacts from range developments would be the same as described under Alternative B.

Allotment Closures: Under Alternative C in Parashant, full, partial, or seasonal closures on seven allotments would occur. Full closures would eliminate impacts on 36,428 acres (40,833 less than Alternative B) and partial/seasonal restrictions would reduce impacts on 13,476 acres (205 acres less than Alternative B) of areas that would be allocated to maintain wilderness characteristics.

Impacts from livestock grazing in Vermilion would be the same as those described under Alternative B. In the Arizona Strip FO impacts from livestock grazing would be similar to Alternative B.

Impacts from Recreation

Impacts from signing and facilities would be the same as described under Alternative A for the unallocated wilderness characteristics “supply.” However, for areas allocated to maintain wilderness characteristics under Alternative C, the active management of this allocation would contribute to greater mitigation and/or disallowance of projects that could be hinder or prevent the maintenance of wilderness characteristics. Impacts from geocaching, recreation marketing actions, and visitor use reporting would be the same as described under Alternative B.

Restoration Projects: Active restoration projects would have a localized impact and a generally short-term effect on solitude, naturalness, and primitive/unconfined recreation, depending on the scope of the project. Long-term benefits would be realized by active restoration; having a full suite of restoration tools would allow an aggressive approach to controlling invasive species in areas allocated to maintain wilderness characteristics.

Visitor Limits and Regulations: Using a Limits of Acceptable Change (LAC) framework in intensive use areas would have a positive impact on areas allocated to maintain wilderness characteristics. The establishment of acceptable resource, social, and managerial settings would

provide an optimal balance between the demand for wilderness use and maintenance of wilderness characteristics. These impacts would be indirect and long-term.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative B.

Alternative D

Impacts from Trails and Travel Management

Under Alternative D, 250 miles of routes in Parashant and 130 miles of routes in Vermilion could potentially be closed or seasonally closed to the public (miles are the combination of routes potentially closed to motorized and mechanized vehicle use and routes potentially open to administrative use only.) Of these closures, 105 miles in Parashant and 53 miles in Vermilion run parallel to or are within the wilderness characteristics "supply." In Parashant, 36 miles of routes would potentially be closed or seasonally closed to the public that run parallel to, or are within the proposed Alternative D allocation to maintain wilderness characteristics. No lands in Vermilion would be allocated to maintain wilderness characteristics under Alternative D.

These potential closures could have a minor to moderate impact on areas allocated to maintain wilderness characteristics. Some impacts would be positive, as potential route closures would enhance solitude and naturalness. The effects would be direct and long-term, becoming noticeable as soon as the routes were closed, and also over time, as closed routes were allowed to rehabilitate and eventually blend in with the surrounding landscape. However, potential administrative use only and seasonal closures would have little impacts on naturalness. Because the number of potential route closures in this alternative is significantly less than Alternative B and slightly less than Alternative C, impacts to areas allocated to maintain wilderness characteristics would be expected to be minor to moderate as potential open routes in close proximity degrade naturalness and solitude.

Outstanding opportunities for primitive, unconfined recreation would be reduced in Vermilion because no areas would be allocated to maintain wilderness characteristics. While the total area available for primitive recreational pursuits would decrease, because of their remoteness, the primitive nature of these areas would likely continue.

Outstanding opportunities for primitive, unconfined recreation would be reduced in Parashant and the Arizona Strip FO. With routes potentially closed to the public on areas allocated to maintain wilderness characteristics, the total area available for primitive recreational pursuits would increase. However, unlike Alternative B, where potential route closures may render many areas impractical to visit using primitive means, under this alternative, all access routes would be preserved, maintaining opportunities to experience primitive recreation.

Pending route designation, impacts in the Arizona Strip FO would be similar to those described in Alternative B.

Impacts from Wilderness Characteristics

Under Alternative D, 140,949 acres in Parashant and none of the Vermilion would be allocated to maintain wilderness characteristics. This represents 32 percent and 0 percent, respectively, of the wilderness characteristics "supply", which is considerably less of a commitment to maintain wilderness characteristics than Alternative B. In the Arizona Strip FO, 34,628 acres would be allocated to maintain wilderness characteristics. There are no overlapping, co-lateral management ACEC designations under Alternative D. As a result, Alternative D actually provides the smallest total acreage committed to maintenance of wilderness characteristics.

Impacts from Vegetation Management

Impacts would be the same as described under Alternative C.

Impacts from Fish and Wildlife

Impacts from wildlife habitat improvement projects, vegetation treatment projects, and restoration of native wildlife populations would be the same as described under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts From Visual Resources

Impacts in Parashant would be similar to those described under Alternative C based on VRM class assignments, although 38,569 more acres would be assigned to VRM Class III and thus be subject to greater landscape modification, potentially effecting naturalness, as well as opportunities for solitude and primitive/unconfined recreation.

Impacts in Vermilion and the Arizona Strip FO would be similar to those described under Alternative A and B respectively.

Impacts From Cultural Resources

Impacts from cultural resources would be to those described under Alternative B.

Impacts from Livestock Grazing

Overall impacts from livestock grazing and impacts from range developments would be the same as described under Alternative B.

Allotment Closures: Under Alternative D, seven allotments in Parashant would be subject to full, partial, or seasonal closures. Impacts from full closures would be 6,951 acres fewer acres than described under Alternative C. Partial/seasonal restrictions would be the same as Alternative C. Impacts in Vermilion due to the lack of allotment closures would be the same as described under Alternative A, while impacts in the Arizona Strip FO would be the same as described under Alternative C.

Impacts from Recreation

Impacts from signing and facilities would be the same as described under Alternative A. Impacts from recreation marketing actions would be the same as described under Alternative B. Impacts from restoration projects would be the same as described under Alternative C.

Geocaching: Working with local geocachers to relocate geocache sites if, through monitoring, it was determined that resources would be at risk would have a generally positive impact on areas allocated to maintain wilderness characteristics. This approach would reduce or eliminate many of the impacts often associated with geocaching. The reduction in impacts would be direct and localized, but would require monitoring to ensure that improvements had long-term benefits.

Visitor Limits and Regulations: Establishing visitor limits, supplemental rules, or restrictions on a case-by-case basis when resource and social impacts exceed acceptable limits would reduce or maintain the number of users, having a generally positive and direct impact on areas allocated to maintain wilderness characteristics. However, such practices would be based on waiting until areas displayed degraded conditions and would not allow the flexibility to manipulate use levels based on changing social and/or resource conditions.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative B.

Alternative E: Preferred

Impacts from Trails and Travel Management

Under Alternative E, 376 miles of routes in Parashant and 168 miles of routes in Vermilion could potentially be closed or seasonally closed to the public (miles are the combination of routes potentially closed to motorized and mechanized vehicle use and routes potentially open to administrative use only.) Of these closures, 172 miles in Parashant and 75 miles in Vermilion

run parallel to or are within the wilderness characteristics "supply." In Parashant, 36 miles of routes would potentially be closed or seasonally closed to the public that run parallel to, or are within the proposed Alternative E allocation to maintain wilderness characteristics, while 32 miles of such routes in Vermilion would potentially be closed or seasonally closed.

These potential closures could have minor to moderate impacts on areas allocated to maintain wilderness characteristics. The impacts would be positive, as potential route closures would enhance solitude and naturalness. The effects would be direct and long-term, becoming noticeable as soon as the routes were closed, and over time, as closed routes were allowed to rehabilitate and eventually blend in with the surrounding landscape. Where routes are potentially left open for administrative use and where they are potentially seasonally closed, routes would continue to be noticeable. Because the number of potential route closures in this alternative would be significantly less than Alternative B, negative impacts to areas allocated to maintain wilderness characteristics would be expected to increase. However, the areas affected are already remote and any routes in proximity receive light traffic only so impacts to naturalness and solitude are expected to be minor.

Outstanding opportunities for primitive, unconfined recreation would increase. Closing routes to the public on areas allocated to maintain wilderness characteristics would increase the total area available for primitive recreational pursuits. However, unlike Alternative B, where route closures may render many areas impractical to visit using primitive means, under this alternative, most access routes have been preserved, maintaining primitive recreational opportunities. The impacts would be similar to Alternative C.

Pending route designation, impacts in the Arizona Strip FO would be similar to those described in Alternative B.

Impacts from Wilderness Characteristics

Under Alternative E, 140,949 acres in Parashant and 36,018 of the Vermilion would be allocated to maintain wilderness characteristics. This represents 48 percent and 38 percent, respectively, of the wilderness characteristics "supply," which is somewhat less of a commitment to maintain wilderness characteristics than Alternative B. In the Arizona Strip FO, 34,415 acres would be allocated to maintain wilderness characteristics. There is one overlapping, co-lateral management ACEC designation under Alternative E in the Grama Canyon area. As a result, Alternative E actually offers slightly more areas allocated to maintain wilderness characteristics compared to Alternative D, but significantly less than all other action alternatives.

Impacts from Vegetation Management

Impacts would be the same as described under Alternative C.

Impacts from Fish and Wildlife

Impacts from wildlife habitat improvement projects, vegetation treatment projects, and restoration of native wildlife populations would be the same as described under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts from Visual Resources

Impacts in Parashant would be the same as described under Alternative C, while impacts in Vermilion and the Arizona Strip FO would be the same as described under Alternative B.

Impacts from Cultural Resources

Impacts from public use sites would be the same as described under Alternative B. Impacts from cultural surveys would be the same as described under Alternative B. Impacts from ACEC designations would be the same as described under Alternative C.

Impacts from Livestock Grazing

Overall impacts from livestock grazing and impacts from range developments would be the same as described under Alternative B.

Allotment Closures: Under Alternative E in Parashant, full, partial, or seasonal closures on seven allotments would occur. Full closures would eliminate impacts on 36,415 acres (38,845 less than Alternative B; 1,987 more than Alternative C; 8,938 more than Alternative D) and partial/seasonal restrictions would reduce impacts on 38,415 acres (24,734 acres less than Alternative B) of areas that would be allocated to maintain wilderness characteristics.

Impacts from livestock grazing in Vermilion would be the same as those described under Alternative B. In the Arizona Strip FO impacts from livestock grazing would be similar to Alternative C.

Impacts from Recreation

Impacts from recreation marketing actions and signing and facilities would be the same as described under Alternative B. Impacts from restoration projects and visitor limits and regulations, would be the same as described under Alternative C. Impacts from geocaching would be the same as described under Alternative D.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative B.

Cumulative Impacts

The geographic area of analysis for cumulative impacts to wilderness characteristics is the Planning Area. Wilderness characteristics are primarily affected by the number and proximity of motorized travel corridors; the volume and type of traffic on those corridors; and the quantity and type of recreational users. To a lesser extent, range and wildlife management projects can affect areas with wilderness characteristics. These impacts normally come from vegetation treatments and the installation, maintenance, and use of range/wildlife catchments and wildlife drinkers.

Population growth and the resulting increase in recreational use are expected to eventually generate impacts to areas allocated to maintain wilderness characteristics. An increase in motorized and non-motorized use during the life of this plan could have major impacts on solitude, naturalness, and opportunities for primitive/unconfined recreation.

Vegetation treatments could be conducted on some areas allocated to maintain wilderness characteristics in those areas classified as VRM Class III in the agency-preferred alternative, with potential long-term impacts to naturalness, solitude, and opportunities for primitive/unconfined recreation.

The growing need to decrease catastrophic fire potential in the region through the reduction of fuel loads by mechanical means would gradually and visibly alter landscapes where treatments are conducted, with short and long-term reductions in the quality of solitude, naturalness, and opportunities for primitive/unconfined recreation.

IMPACTS TO RESOURCE USES

VEGETATION PRODUCTS

Impacts to Vegetation Products

As discussed in Chapter 3, the sale, collection, or use of vegetative products (e.g., native seed, medicinals, landscape mulch, posts, fuel wood, Christmas trees, lumber, etc.) is limited in the Planning Area. Under all the alternatives, the sale of vegetative products in the Monuments would generally not be authorized. The only exception is that the sale, collection, or use of vegetative material could be allowed on BLM lands in Parashant, by permit only, if associated with a research or restoration project. In general, the sale, collection, or use of vegetative materials would be authorized in the Arizona Strip FO, but would require a permit. Such items as pinyon pine seeds and dead and downed wood for campfire use (where campfires are allowed

and subject to fire restrictions) could be collected throughout the Planning Area and would be excluded from the permit requirement.

Overall, since the use and demand for vegetative products is minimal throughout the Planning Area, impacts to that use/demand due to management actions proposed under all the alternatives (primarily from the vegetation resources program) would be negligible. Refer to Impacts to Cultural Resources and Impacts to Socioeconomics for details on how restrictions on the sale, collection, or use of vegetative products would affect American Indian groups and socioeconomics within and surrounding the Planning Area.

LANDS AND REALTY

This section presents potential impacts of the various resource program alternatives on the Lands and Realty program, specifically on land tenure decisions (disposals, acquisitions, withdrawals) and land use authorizations (ROWs, permits, leases). See Chapter 3 for a discussion of the Lands and Realty program in the Planning Area.

Lands and Realty actions are vulnerable to any management action that would limit or deny authorization of an ROW or permit; limit exchange, lease, or sale of a parcel to a governmental entity, qualified individual, or business entity; or limit classification of lands for resource protection or the public good. Any management action that limits or denies these Land and Realty actions would affect the Lands and Realty program and the public.

The various kinds and types of authorizations and realty actions conducted by the Lands and Realty program would differ by planning area. Lands and Realty actions in the Monuments would be constrained by the proclamation for each Monument and the purpose, significance, and missions statements. For example, lands within the Monuments cannot be exchanged or sold out of Federal ownership but may be acquired within the Monuments. The proclamations provide that lands and interests in lands within the boundaries of the Monuments are withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the Monument. The proclamations also provide that lands and interests in lands within the Monuments not owned by the United States would be reserved as a part of the Monument upon acquisition by the United States.

Lands and Realty actions in the Arizona Strip FO would allow the full array of potential realty actions the BLM authorizes. The Lands and Realty program impacts are a direct result of management actions of other resource programs. All Land and Realty actions are performed using an interdisciplinary approach with input from other resource programs in order to address potential resource conflicts. Site-specific NEPA analysis would be performed on all land actions.

Methods and Assumptions

To analyze the potential effects of the alternatives on the Lands and Realty program, information was gathered from administrative files for lands and realty actions in and adjacent to the Planning Area and from the various actions proposed by other resource programs. The analysis is also based on the professional expertise of BLM specialists at the Arizona Strip FO and the Arizona State Office, and the realty specialist's knowledge of the area.

Effects are quantified where possible. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

For purposes of this analysis, the levels of effect on Lands and Realty were defined as follows:

- Negligible: The effect would be barely detectable, and/or the public would not be affected.
- Minor: The effect would be slight, but detectable, and/or the public might be affected.
- Moderate: The effect would be readily apparent and/or the public would be affected.
- Major: The effect would be severely adverse or exceptionally beneficial and/or the public would be affected.

The area of analysis for cumulative effects was defined as the Planning Area boundary and those communities and city immediately adjacent including Mesquite, Nevada; St. George, Hildale, and Kanab, Utah; and Page, Arizona.

The following assumptions regarding future Lands and Realty actions were made;

- **Disposals**

1. Only lands or interests in lands identified for disposal in the Arizona Strip FO could be sold or exchanged out of Federal ownership.
2. No land disposals would take place within the Monuments.
3. No lands have been identified for disposal within any ACECs.
4. The identification of lands for disposal in the Arizona Strip FO does not ensure that these lands would be sold or otherwise disposed.
5. Before any disposals occur, lands would be examined for the presence of high-value resources. Lands that contain high surface values would not be disposed of or the disposal would provide for those values to be preserved.
6. Disposal of small, isolated parcels of public land would decrease the cost of public land administration in the Arizona Strip FO and enhance efficient management of remaining public lands.

7. The disposal of small, isolated parcels would decrease conflicts between public land users and private landowners.
- **Acquisitions**
 1. Non-federal land, interests in land, access easements, and water rights would be considered for acquisition when they are within Congressionally or administratively designated areas or contain important resources (i.e., NLCS units, Monuments, ACECs, DWMAs, critical habitat, lands supporting listed species, and riparian/wetland areas, etc.).
 2. Acquisition, in the form of direct purchase, conservation easement, donation, or exchange would only be considered when there is a willing seller and the goals and objectives of the land use plan would be furthered.
 - **Land Use Authorizations**
 1. The effects of development of utility and transportation systems would be mitigated individually. Generally, this would be accomplished by consolidation of new developments along existing routes or by innovative construction techniques that disturb less land and improve reclamation success.
 2. Visitor's centers for Monuments would be located outside the Monuments and in nearby communities.
 3. Requests for renewable energy generating projects would only be considered within the Arizona Strip FO and not within the Monuments.

Impacts to Lands and Realty

Impacts to the Lands and Realty program in Parashant and Vermilion would result from actions proposed under the following resource management programs:

- Trails and Travel
- Wilderness Characteristics
- Vegetation, including Fire and Fuels Management
- Special Status Species (Arizona Strip FO only)
- Visual
- Special Area Designations (Vermilion and Arizona Strip FO only)
- Recreation
- Lands and Realty

Alternative A: No Action

Impacts from Trails and Travel

There would be negligible impacts to Lands and Realty from Trails and Travel Management under the No Action Alternative. No TMAs would be developed. The most motorized and

mechanized routes open to the public would occur under this alternative. Therefore, access to private and state parcels would continue.

Impacts from Wilderness Characteristics

No lands would be allocated for wilderness characteristics under this alternative.

Impacts from Vegetation, including Fire and Fuels Management

Wildland and non wildland fire use, appropriate management response, and prescribed fire suppression activities could have potential impacts to ROWs (powerlines, communication sites, etc.), facilities, and adjacent non-BLM lands, however, chances of catastrophic fire would be reduced, which would have greater impacts overall. Post fire rehabilitation improvements could affect adjacent non-BLM lands (less erosion, less chance of alien plant invasion, etc.). Impacts to Lands and Realty would be minor.

Impacts from Special Status Species (Arizona Strip FO only)

In the Arizona Strip FO approximately 25,119 acres would be identified for disposal, including approximately 170 acres within the Beaver Dam Slope ACEC. The BLM's ability to support community growth and expansion would be limited because some of the land identified for disposal would be within the Beaver Dam ACEC. Impacts to the local communities could be moderate.

The utility corridor would remain one mile wide, except one-half mile wide in the Ferry Swale area and the width of the ROW across the Beaver Dam Slope would be only the width occupied by the existing power lines and a second yet un-built line. Only one additional new ROWs proposal within the corridor could be approved irregardless of the size and type of proposed powerline. Impacts to the local communities could be moderate.

Lands and Realty would be affected in areas where no land disposal of listed species or critical habitat is allowed especially when special status species habitat is located in an area with high exchange or sale value or with high development value. The presence of special status species may preclude the issuance of some land use authorizations and place restrictions on others. The reintroduction of endemic or non-endemic special status species may potentially impact Lands and Realty depending upon the species and the use restrictions and/or conservation measures applied. The mitigation requirement to fence new roads in desert tortoise habitat would potentially impact applicants of land use authorizations in areas that border desert tortoise habitat. Overall impacts to Lands and Realty would be moderate.

Impacts from Visual Resources

Under the No Action Alternative, more than one-third of Parashant would be assigned to VRM Class III or IV, which would allow more visual modifications than under any other alternative. Impacts to Lands and Realty actions would be negligible to minor under this alternative.

Under this alternative, all the acres in Vermilion would be assigned to VRM Class I or II. Because there would be no new ROWs or ancillary public facilities authorized in the Monuments, there would be no impacts from Visual.

In the Arizona Strip FO, two-thirds of the acreage would be assigned to VRM Class III or IV, slightly less than under Alternative B, but more than any other alternative other than B. Impacts to Lands and Realty would be minor.

On lands open to lease and the operation of mining laws in the Arizona Strip FO, mineral exploration and development could lead to increased Lands and Realty actions such as ROWs (powerlines, communication sites, etc.) and facilities. Also, the sale of mineral materials and establishment of community pits could also lead to increased Lands and Realty actions. Impacts to Lands and Realty would be minor.

The Navajo-McCullough ROW/utility corridor across the northern portion of Arizona Strip FO crosses a variety of VRM classifications, including VRM Class II, III, and IV, thus creating conflicts between use, maintenance, and any proposed additional facilities within the corridor. Impacts on Lands and Realty would be minor to major depending on the VRM Class in which the action is proposed within the ROW.

Impacts from Recreation

SRMAs would continue in the designated wildernesses and at Little Black Mountain and Virgin River Corridor ACECs. Management of recreation activities in these SRMAs could compliment other community support initiatives and may help to reduce user conflicts. Impacts to Lands and Realty would be minor.

The potential for user conflicts and safety issues with ADOT management of I-15 would continue due to public access issues relating to river use and rock climbing areas in the Virgin River Gorge. Impacts to Lands and Realty would be minor.

Impacts from Special Area Designations

Wild and Scenic Rivers. Impacts on Lands and Realty would continue to be affected where management activities along the Virgin River are not allowed to damage existing eligibility, classification, or suitability. The wild and scenic river suitability determination could affect community development because the river channel could not be altered. The BLM's ability to

support community growth and expansion by making land tenure adjustments and issuing land use authorizations in the Virgin River Communities area could result in minor impacts.

National Historic Trails. Visitors would be encouraged to respect the rights of landowners in the NHT area, uses of adjacent lands would complement the protection and interpretation of the NHT, grandfathered and valid existing rights would be recognized on public lands, and new land use authorizations should not compromise viability of identified NHT sites and/or segments for future management. Impacts to Lands and Realty could be minor to moderate depending upon the specific location.

Areas of Critical Environmental Concern. In ACECs designated for plants and animals, there would be potential impacts to Lands and Realty in the form of additional or increased stipulations, restrictions on ROWs, R&PP leases, and other land use authorizations. Impacts would be moderate.

Impacts from Lands and Realty

The Navajo-McCullough ROW would continue to be one mile wide, except for narrower widths in the Ferry Swale area and across the Beaver Dam Slope. Future power lines within this corridor would be limited to one additional line. Land acquisitions and use authorizations would continue within the parameters of both Monuments' proclamations. Land disposals would only occur in the Arizona Strip FO. Impacts on Lands and Realty would be minor to moderate.

Alternative B

Impacts from Trails and Travel Management

Alternative B proposes roughly twice as many roads closed compared to Alternative A, which would limit motorized and mechanized access. Impacts would be moderate.

Since access to private and state parcels was considered during route evaluation for the Monuments and the Littlefield sub-region, impacts on motorized and mechanized access to these areas would be negligible.

Impacts from Wilderness Characteristics

The BLM would acquire private or state inholdings from willing sellers in areas allocated to maintain wilderness characteristics in Arizona Strip FO, while acquisition of private or state inholdings from willing sellers would occur on all lands in the Monuments. Thus, impacts to the Lands and Realty program would only occur in the Arizona Strip FO and they would be minor because of the limited amount of non-Federal acreage involved.

Impacts from Vegetation, including Fire and Fuels Management

Impacts would be the same as discussed under Alternative A. Additionally, construction equipment and/or vehicles from outside the Planning Area used to implement authorized projects and uses would be required to be cleaned prior to entering the Planning Area and initiating projects. Impacts to authorized land users would be minor.

Impacts from Special Status Species

Impacts would be the same as discussed under Alternative A, except that less acreage would be available for disposal. In the Arizona Strip FO, the BLM's ability to support community growth and expansion would be more limited under this alternative because of the lower number of acres identified for disposal. No lands would be identified for disposal within the Beaver Dam ACEC, which could impact the Virgin River communities near Littlefield because of the limits to community growth and expansion. Impacts would be moderate.

Impacts from Visual

The types of impacts would be similar to those discussed under Alternative A. The percentage of lands assigned to VRM Class I and II would be more under this alternative than any other, while the percentage of VRM Class III and IV would be the least under this alternative. Impacts would remain moderate.

The entire length of the existing utility corridor would be assigned to VRM Class IV, which would lessen conflicts from visual contrasts within the ROW corridor than would be experienced under Alternative A.

Impacts from Special Area Designations

Wild and Scenic Rivers. Impacts would be the same as under Alternative A.

National Historic Trail. Impacts would be the same as under Alternative A.

Areas of Critical Environmental Concern. Impacts would be the same as under Alternative A, except that they would be more widespread as Alternative B proposes the most ACEC acreage designation than under any other alternative. Impacts would still be moderate.

Impacts from Recreation

Impacts would be the same as under Alternative A.

Impacts from Lands and Realty

In the Arizona Strip FO, the existing utility corridor beginning at the Glen Canyon Dam and ending at the Arizona/Nevada border would remain one mile wide, except in the Ferry Swale area and Beaver Dam Slope ACEC where the corridor would be ½ mile wide. Because every proposed ROWs within the corridor would be subject to site-specific NEPA compliance and compliance with NHPA and ESA, impacts would be minor.

*Alternative C*Impacts from Trails and Travel

About three-quarters of the motorized and mechanized routes open to the public under Alternative A would remain open under this alternative, which is considerably more miles compared to Alternative B. Impacts would be moderate.

Impacts from Wilderness Characteristics

Approximately half as many acres would be allocated for wilderness characteristics in the Monuments compared to Alternative B except in Arizona Strip FO where there would be a 68% increase from Alternative B. Impacts would be minor because of the limited amount of non-Federal acreage involved.

Impacts from Vegetation, including Fire and Fuels Management

Impacts would be the same as under Alternative B.

Impacts from Special Status Species

Impacts to Lands and Realty from the identified resource management programs would be the same as Alternative A, except slightly more acres would be identified for disposal. The BLM's ability to support community growth and expansion would be improved over Alternative B because of the increased number of acres identified for disposal. Impacts are expected to be less than those under Alternative B, they would, however, remain moderate.

Impacts from Visual

Significant amounts of acreage would be assigned to VRM Class III, more than under Alternative A but less than under Alternative D. Impacts would be minor.

Impacts from Special Area Designations

Wild and Scenic Rivers. Impacts would be the same as under Alternative A.

National Historic Trail. Impacts would be the same as under Alternative A.

Areas of Critical Environmental Concern. Impacts would be the same as under Alternative A.

Impacts from Recreation

Impacts would be the same as under Alternative A.

Impacts from Lands and Realty

The existing utility corridor would be the same as under Alternative B. Other impacts would be the same as under Alternative A.

Alternatives D and E (Preferred Alternative)

Impacts from Trails and Travel

With the exception of Alternative A, the most motorized and mechanized routes open to the public would occur under Alternative D. Alternative E proposes slightly fewer miles of open motorized and mechanized routes than Alternative D but significantly more than Alternative B. Less than half as many routes would be closed to motorized and mechanized public use under Alternative E than under Alternative B, but approximately two times more would be closed than under Alternative A. Impacts would be minor.

Impacts from Wilderness Characteristics

Among the action alternatives, Alternative D proposes the least amount of acreage allocated for wilderness characteristics, followed by Alternative E. Impacts, however, would remain minor under both alternatives due to the limited amount of non-Federal acreage involved.

Impacts from Vegetation, including Fire and Fuels Management

Impacts would be the same as under Alternative B.

Impacts from Special Status Species

Impacts would be the same as under Alternative C.

Impacts from Visual

In Parashant, more acreage would be assigned to VRM Class I and Class II than under Alternative A, and significantly less land would be assigned to VRM Class IV. Significantly

more acres would be assigned to VRM Class III than under Alternative A. Impacts to Lands and Realty would be minor. In Vermilion, approximately the same amount of acreage would be assigned to VRM Class I, II, and III. Twelve acres would be assigned VRM Class IV under Alternatives D and E, whereas Alternative A would assign no VRM Class IV acres in the Monument. Impacts to Lands and Realty would be negligible to minor.

In Arizona Strip FO under Alternatives D and E, a little more than half the acreage would be assigned to VRM Class II compared to Alternative A. Slightly fewer acres would be assigned to VRM Class I, four times more acres would be assigned to VRM Class III, and 8 percent as many acres would be assigned VRM Class IV. Impacts on Lands and Realty would be minor.

Impacts from Special Area Designations

Wild and Scenic Rivers. Impacts would be the same as under Alternative A.

National Historic Trail. Impacts would be the same as under Alternative A.

Areas of Critical Environmental Concern. Impacts would be the same as Alternative A except that the least amount of acreage proposed for ACECs would occur under Alternative D, which would make impacts less widespread. Impacts would remain moderate under both Alternative D and E.

Impacts from Recreation

Impacts would be the same as under Alternative A.

Impacts from Lands and Realty

The existing utility corridor beginning at the Glen Canyon Dam and ending at the Arizona/Nevada border would be designated one-mile wide. All proposed ROWs within the corridor would be subject to site-specific NEPA compliance and compliance with cultural and ESA laws so impacts are expected to be minor. Other impacts would be the same as under Alternative A.

Cumulative Impacts

Cumulative impacts to lands and realty could occur through changes in the designation and development of land resources and in changes to access of the land. Under the Preferred Alternative, the Navajo-McCullough ROW corridor would be one mile wide and allowed one future transmission line between the Arizona/Nevada state line and St. George, Utah. Other ROW proposals would also be evaluated including the Lake Powell Pipeline and Fort Pearce Reservoir.

LIVESTOCK GRAZING

This section presents potential impacts of the alternatives on livestock grazing as determined through changes in allocations, designations, and/or resource uses. See Chapter 3 for a discussion of livestock grazing in the Planning Area.

Livestock grazing operations may be impacted by management actions that alter types and amounts of grazing permitted and the amount and type of vegetation present in livestock grazing allotments. The latter can be influenced by vegetation treatment efforts, soil stability, and watershed function. Impacts to livestock grazing operations also come from interaction with visitors, access provisions, and other management factors that limit or restrict livestock grazing in certain areas.

Methods and Assumptions

Available information was obtained through relevant literature, best management practices, standards and guidelines assessments, monitoring, existing land use plans, and consultation with the public, livestock grazing permittees, and interdisciplinary teams. Impacts were assessed using best professional judgment from BLM and NPS resource specialists. Effects are quantified where possible. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible:** The impact would not be detectable. Grazing operations would not be appreciably affected. Normal day-to-day livestock grazing operations would not be affected.
- Minor:** The impact would be detectable. The effect would be perceptible, and the action would result in a slight change in grazing operations, but the change would be localized. Normal day-to-day livestock grazing operations would not be affected, except in small, localized areas.
- Moderate:** The effects would be apparent, and the action would result in a limited change in grazing operations. Normal day-to-day livestock grazing operations may be restricted.
- Major:** The impact would be severe. The effects would be readily apparent or widespread, and the action would result in a substantial change in livestock grazing operations. Normal day-to-day livestock operations would be restricted.

The following assumptions regarding the future management of livestock grazing resources are made:

- All laws, regulations, and policies for the management livestock grazing would be followed, to the extent allowed by budget and available personnel.
- Livestock grazing would be managed to meet the BLM Arizona Standards for Rangeland Health and NPS Vital Signs.
- The type and amount of grazing use would be expected to remain approximately the same.
- Range improvements would continue to occur at current rates to reach rangeland improvement goals.
- Improvements would include the following types of projects: spring/seep development and protection; reservoirs and pits; wells; new or modified fencing; vegetation treatments; and pipelines.

Impacts to Livestock Grazing

Impacts to livestock grazing would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Wilderness Characteristics
- Vegetation and Fire and Fuels Management
- Special Status Species
- Fish and Wildlife
- Air, Water, and Soil
- Visual Resources
- Minerals (Arizona Strip FO only)
- Special Area Designations (ACECs; Arizona Strip FO only)
- Livestock Grazing
- Recreation
- Lands and Realty (Arizona Strip FO only)

Alternative A: No Action

Impacts from Trails and Travel Management

Under Alternative A in the Arizona Strip FO, all authorized public land users that hold a permit or license (i.e., grazing permittees; ROW holders; persons with wood permits, hunting license, mining claims; etc.) would be allowed to continue to drive off-road, if necessary, in order to fulfill requirements of their permit or license in a limited to existing roads and trails area. Specific requests and approval by the authorized officer would continue to be required prior to most off-road vehicle use in limited to designated roads and trails areas.

Both Monument proclamations prohibit vehicle use off road except for emergency or authorized administrative purposes. Cross-country travel is a management tool used by livestock grazing operators. Eliminating the possibility of using such a tool would increase overhead costs by increasing time necessary to conduct support activities and reducing efficiency resulting in negligible to moderate impacts to the livestock grazing operation.

For all three planning areas, the most miles of roads would remain open and the least closed under Alternative A. This would facilitate livestock management by allowing continued access to livestock grazing operations. However, it is expected that visitation to the monument would continue to grow at high rates during the life of this Plan. Easy access afforded by the most miles of open roads would allow for increased interaction of the public with livestock and livestock developments (e.g., fences, corrals, and water developments). This would increase the occurrences of livestock harassment, gates being inappropriately left open or closed, and range improvements being damaged.

Providing the greatest miles of roads under Alternative A would also facilitate dispersed visitor use, which, in turn, would diffuse impacts to livestock and related facilities instead of concentrating such impacts on particular allotments or areas. Overall, Alternative A would cause the fewest impacts to livestock grazing operations compared to the other Alternatives. Such impacts would be moderate.

Impacts from Lands with Wilderness Characteristics

No areas would be allocated for wilderness characteristics under Alternative A.

Impacts from Vegetation and Fire and Fuels Management

Within the Planning Area, vegetation treatments and restoration activities such as mechanical and chemical, including fire and fuels management, would continue to be implemented. These activities would decrease forage available for livestock use in the short term and could result in seasonal restrictions, temporary reductions, or elimination of authorized activities to protect sensitive resources and/or ensure attainment of restoration objectives. Restoration activities in the long term would improve the watersheds and vegetation, and provide additional forage for livestock. These impacts would be moderate.

Wild fire could decrease forage available for livestock use in the short term, and would require changes in and restrictions to livestock grazing use during emergency fire rehabilitation. In the long term, forage quality and quantity available to livestock could potentially increase. Overall, these impacts would be moderate.

Treatment of noxious weeds would control and/or contain weed species proliferation, thereby maintaining forage production, diversity, and vigor in the treatment areas. Long-term impacts would range from minor to moderate.

Impacts from Air, Water, and Soil

Air, Water, and Soil management considerations during the implementation of the Arizona Standards for Healthy Rangelands generally insure proper vegetative conditions and that allowable uses/actions are designed to minimize erosion. These considerations could indirectly increase forage levels for livestock.

Specific grazing management practices designed to protect vegetation and soils could be required on some small localized areas with soil erosion concerns, which could have minor impacts to livestock operation(s) involved. Normal day-to-day livestock grazing operations may be restricted on some allotments containing larger areas with soil concerns, resulting in localized moderate to major impacts to the livestock grazing operation(s) involved.

Implementing watershed management activity plans would continue to improve the watershed conditions by increasing vegetation cover, reducing erosion, and indirectly increasing forage conditions. Implementing such plans would cause negligible to moderate short-term impacts on livestock operations as livestock use is adjusted to provide protection until treatment can become established. The long-term effect would be reduced erosion from increased vegetation and ground cover, which could result in better forage conditions for livestock.

Impacts from Fish and Wildlife

Management and restoration of native wildlife populations into their historic ranges could have negligible to minor short- and long-term impacts on livestock operations by creating conflict with space, forage use, and water. However, the two activities have mutual goals. Water developments designed to provide new water sources for wildlife in some situations increase water availability for livestock, promoting improved distribution of both livestock and wildlife.

Limiting fences to specific designs to allow wildlife movement may allow livestock to move into and out of fenced pastures, which would increase the cost of locating the animals as well as allow grazing outside permitted areas. The need to modify existing fences to meet standards would also increase costs for livestock operators, resulting in minor impacts.

Animal damage control efforts removing animals known to have killed livestock could have minor to moderate impacts by reducing further predation and loss of animals.

Impacts from Special Status Species

Under Alternative A, season of use restrictions, exclusion of livestock, loss of access, or other restrictions meant to protect special status species may impact livestock grazing operations through the loss of forage, increased difficulty of access, increased costs, reduction in livestock numbers, or allotment closures. Impacts would range from minor to moderate.

Impacts from Visual Resources

Depending on the VRM class, new range improvements such as structures or vegetation treatments would be required to meet VRM class objectives. Some VRM class restrictions on range improvement design could affect functionality and cost by not allowing the construction of pipelines and water storage tanks to distribute livestock grazing where perennial forage is available. Impacts would range from negligible to moderate.

Impacts from Minerals (Arizona Strip FO only)

Historically, minerals activities have had only minor impacts on the forage available to livestock. However, any major mineral activity has the potential to increase or decrease the forage available to livestock. Such impacts would be negligible to moderate, depending on the size and duration of the project. In addition to displacing cattle, mining operations also have the potential to injure or kill cattle due to increased use of roads and presence of heavy mining equipment.

Impacts from Special Area Designations (ACECs)

In the Arizona Strip FO, ACECs would continue to cover 127,193 acres or 6 percent of the planning area. These designations would continued to have minor to major impacts on those allotments within ACEC boundaries as grazing operators are required to adjust their normal, day-to-day operations to meet seasonal-use restrictions.

Impacts from Livestock Grazing

Designating the Parashant Allotment (Parashant) as a forage reserve would compliment restoration research and assist in stabilizing local livestock operations while accomplishing resource objectives on a landscape scale. Impacts would be negligible to minor because AUMs would still be available through either forage reserves or reconfiguration, which would help in stabilizing the livestock grazing in the area.

Impacts from Recreation

Under Alternative A, recreation activities would continue to directly impact livestock grazing operations through human disturbance, including animal displacement; livestock respiratory problems caused by airborne dust; and the injury or death of animals caused by vehicle collisions. Vandalism to range projects and leaving gates open would also have an impact on livestock grazing operations. These impacts would likely increase over the life of the Plan due to the increasing level of visitation in the Planning Area.

In Vermilion, the River Pasture of the Lees Ferry Allotment would be closed to livestock grazing in order to eliminate conflicts with recreation users. This would create a major impact to the livestock grazing operator involved.

Overall impacts from recreation on livestock grazing would be moderate under Alternative A; the least intense among the alternatives.

Impacts from Lands and Realty (Arizona Strip FO only)

The construction of power lines, pipelines, and other construction activities would temporarily remove forage and displace or cause injury to livestock, resulting in short-term impacts. Long-term impacts would include loss of forage where roads and facilities occur; reduced forage palatability due to dust on vegetation; increased level of human activity; and livestock control problems related to fence, gate, and cattle guard maintenance.

Permanent losses of forage would also be caused by permanent road construction and land disposals and exchanges. Most land disposals and exchanges would be isolated tracts; therefore, the loss of forage would be minimal. Exchanges would be used to reach management objectives, such as consolidating public lands to ease management, which could benefit livestock operations in the long term.

Historically, land exchanges and acquisitions have had only minor impacts on the forage available to livestock. However, any acquisition or exchange of lands has the potential to increase or decrease the forage available to livestock. Overall impacts to livestock grazing would be negligible to minor and normal day-to-day livestock grazing operations would not be affected, except in small, localized areas.

Alternative B

Impacts from Trails and Travel Management

Fewer Roads would be open under Alternative B than any other alternative, which could complicate normal day-to-day livestock grazing operations and result in substantial changes to some operations. Impacts to the grazing permittees involved would range from moderate to major impacts.

Alternative B also proposes the greatest miles for roads open to administrative use only. While these roads would facilitate livestock operations and help alleviate some of the impacts mentioned above, administrative routes would generally be managed at the lowest maintenance levels and frequencies and be subject to the terms of an appropriate authorization instrument, which can be complex, difficult to obtain, and is usually of short duration. As a result, some livestock grazing permittee would experience moderate to major impacts to their normal, day-to-day livestock operations.

Under Alternative B, the largest acreage of lands would be managed in the Primitive TMA, encompassing 87 percent of Parashant, 86 percent of Vermilion, and 37 percent of the Arizona Strip FO. Increased acreage for non-motorized, non-mechanized types of recreation and decreased acreage for motorized, mechanized types of recreation would result in fewer visitor-related impacts to grazing facilities and animals.

In short, implementing Alternative B would affect normal day-to-day livestock operations, which requires the use of motorized mechanized equipment to allow for an economically viable operation. Such impacts to the livestock grazing permittee could range from moderate to major.

Impacts from Wilderness Characteristics

Alternative B proposes the largest allocation of lands with wilderness characteristics. Within Parashant, all livestock grazing facilities and access roads were excluded from areas allocated to maintain wilderness characteristics. As a result, there would be no or negligible impacts in Parashant. In Vermilion and the Arizona Strip FO, however, some facilities and access roads are within the areas that would be allocated to maintain wilderness characteristics. Such access roads would be designated as administrative use only under Alternative B, which would generally be managed at the lowest maintenance levels and frequencies and subject to the terms of an appropriate authorization instrument, which can be complex, difficult to obtain, and is usually of short duration. In addition, future livestock grazing facilities may be more difficult to construct in areas allocated for wilderness characteristics and would need to be considered during the NEPA process covering specific projects. Overall, impacts to the livestock operations involved would be minor.

Impacts from Vegetation and Fire and Fuels Management

The types of impacts would be similar to those described under Alternative A, with the exception that restoration or vegetation treatment activities would be more restrictive and use fewer tools under Alternative B. This alternative also proposes the least amount of acreage of any alternative for sagebrush and pinyon-juniper treatments within the Planning Area, which would result in the least widespread impacts among the alternatives.

Certified weed-free feed would be required for all permitted stock to limit the spread of noxious weeds. While this would increase expenses for livestock grazing operations in the short term, elimination of noxious weeds in the long term would maintain forage production, diversity, and vigor of grazing areas. Overall impact would be negligible.

Closing the Cane Springs Pasture of the Mud and Cane Allotment in Parashant would require the permittee to find an alternative holding pasture. If an alternative pasture could be found, moving livestock to it could increase expenses and/or be logistically complicated. The inability of

finding an alternative pasture could force the permittee to eliminate or reduce the impacted herd, causing further economic hardships. Impacts to the specific livestock operator would be major.

Impacts from Soil, Water, and Air

Impacts would be similar to those described under Alternative A.

Impacts from Fish and Wildlife

Impacts would be similar to those discussed under Alternative A.

Impacts from Special Status Species

Impacts would be the same as described under Alternative A, with the following exceptions:

Under Alternative B in Parashant, a larger portion of the Mosby-Nay allotment would be closed to grazing, with seasonal restrictions placed on the remaining open portions. Also, the entire Pakoon Springs Allotment and the entire Pakoon Allotment with critical desert tortoise habitat would be closed to livestock grazing. These actions would result in an additional 153,029 acres closed to livestock grazing in Parashant compared to Alternative A. These closures, along with additional seasonal restrictions, would substantially change the day-to-day livestock operations currently occurring in the allotments involved. The resultant loss of revenue by the grazing permittees involved could reach the point that they could no longer be able to afford to stay in the livestock business. Impacts would be moderate to major for the livestock grazing permittees involved.

In the Arizona Strip FO, allotments in critical desert tortoise habitat would be closed to livestock grazing. These allotments include most of Mesquite (Littlefield Slope Pasture only), and Littlefield Community (Littlefield Slope Pasture only), and all of the Beaver Dam Slope, Highway, and Mormon Well grazing allotments. All grazing preferences associated with these allotments, and portions thereof, would be canceled, which would result in removal of 124,160 acres from livestock grazing. In addition, additional seasonal restrictions would occur under Alternative B on the remainder of Littlefield Community and the Mesquite Allotments, and the Cedar Wash Allotment would not be allowed ephemeral extensions. Season of use restriction without ephemeral extensions would result in the loss of opportunity to utilize forage production above permitted use when climatic conditions result in excess forage being available. Closures and seasonal use restrictions without ephemeral extensions would result in substantial change to day-to-day livestock operations and loss of revenue to the point that the grazing permittees involved could no longer be able to afford to stay in the livestock business. Grazing permittees who are forced to turn to other means to feed their livestock when public lands become unavailable could experience substantial increases to their operations' costs, potentially to the point where remaining in the livestock business may not be practical. Livestock operations depend greatly on the use of public rangelands to sustain base herds. Most of the grazing

permittees do not own or control enough private lands to support their base herd for 60 or more days without having to feed hay to their animals. Other options, such as renting private pasture, if available, would be too costly for many permittees. In addition, two consecutive dry years could effectively put some grazing lessees out of the cattle business. Overall impacts under Alternative B to the grazing permittees involved would range from moderate to major.

Also in the Arizona Strip FO, livestock would be excluded from suitable flycatcher habitat during the growing season on the Clearwater portion of the Kanab Creek and Wildland allotments and the river portion of the Lambing Allotment. This restriction would result in slight changes to the grazing operations involved. Such changes would be localized and the impacts minor.

Under Alternative B in the Arizona Strip FO, ACEC designations for the protection of special status species would have the greatest impact to livestock operations compared to the other alternatives due to the increased size and number of ACECs. Impacts could range from season-of-use changes to other modifications in grazing systems and permit adjustments. Most management actions aimed at reducing trampling or crushing of special status plants could affect normal, day-to-day livestock operations, and could result in the loss of opportunity to utilize forage production. Impacts would range from minor to moderate. In addition, Vegetation Habitat Management Areas (VHAs) for special status plants (covering three different geographic areas) that would restrict uses to protect special status plants could result in impacts to livestock that are similar ACEC restrictions.

Water developments in listed species habitats could be modified under Alternative B to minimize adverse effects to the species. This action could result in restrictions to livestock use, including changes in season of use and necessitate the moving of waters, which could change normal, day-to-day operations or result in substantial cost associated with moving waters. Impacts to the livestock grazing operator involved would range from minor to moderate.

Impacts from Visual Resources

Alternative B proposes the most acres assigned to VRM Class I and II, which place the most restrictions on grazing. These VRM class assignments would require new range improvements projects to meet certain VRM class objectives, or existing ones be brought into conformance as need or opportunity arises. Redesigning new and existing projects to bring them into conformance could affect functionality and cost of grazing operations. This could restrict the permittees by limiting their ability to utilize perennial forage and not allowing better livestock distribution. Impacts to the grazing permittees involved could range from negligible to moderate.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be similar to those described under Alternative A.

Impacts from Special Area Designations (ACEC)

In the Arizona Strip FO, Alternative B proposes the most acres to be under ACEC designation compared to all other alternatives, resulting in the most widespread impacts. Compared to Alternative A, the increase would affect an additional 27 grazing allotments.

Impacts to grazing from additional ACEC acreage could range from season-of-use changes to other modifications in grazing systems and permit adjustments. Impacts would be both short and long term and range from moderate to major. These changes could affect the normal, day-to-day livestock operation, and could result in a loss of opportunity to utilize forage production. This could increase the cost of grazing operations. Impacts to grazing permittees involved would range from minor to moderate.

Impacts from Livestock Grazing

Designating the Parashant Allotment (Parashant) as a forage reserve would compliment restoration research and assist in stabilizing local livestock operations while accomplishing resource objectives on a landscape scale. Impacts would be negligible to minor because AUMs would still be available through either forage reserves or reconfiguration, which would help in stabilizing the livestock grazing in the area.

Impacts from Recreation

In Vermilion, the River Pasture of the Lees Ferry Allotment would be closed to livestock grazing in order to eliminate conflicts with recreation users. This would create a major impact to the livestock grazing operator involved.

Impacts from Lands and Realty

Impacts would be similar to those described under Alternative A

Alternative C

Impacts from Trails and Travel Management

Impacts from road closers and restrictions would be similar to those described under Alternative B, although slightly less intense as a few more miles of roads would be left open and fewer miles of road would be closed. Impacts would range from moderate to major, depending on the specific roads involved.

Impacts from TMA designations would also be similar to Alternative B, albeit less intense as there would be fewer acres of Primitive TMA.

Impacts from Wilderness Characteristics

Impacts would be similar to those described under Alternative B, although less widespread in the Monuments as fewer acres are proposed for maintaining wilderness characteristics and fewer allotments would be affected. Impacts in the Monuments would be minor. Impacts would be more widespread in the Arizona Strip FO as more acres would be allocated wilderness characteristics and more allotments would be affected. Impacts in the Arizona Strip FO would be moderate.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be similar to those discussed under Alternative B. One exception is that more acres of both sagebrush and pinyon-juniper habitats could be treated, and such treatments could occur sooner when compared to Alternative B.

In Parashant, the Cane Springs riparian area would be fenced and closed to grazing, which would be more restrictive than under Alternative A but less restrictive than under Alternative B. While the Cane Springs pasture would continue to act as a holding pasture, the permittee would be required to operate and maintain a water collection facility, which is more restricted and more costly to accomplish than if the riparian area was open to grazing. Impacts to the particular livestock operator would be moderate.

Impacts from Air, Water, and Soil

Impacts would be similar to those described under Alternative B.

Impacts from Fish and Wildlife

Impacts would be similar to those discussed under Alternative B, with the exception four additional Watchable Wildlife areas would be added in Parashant, one would be created in Vermilion, and five would be added in Arizona Strip FO. These additional Watchable Wildlife areas would increase visitation and potential conflicts with livestock. Impacts to grazing operations would be negligible.

Impacts from Special Status Species

Impacts would be similar to those described under Alternative A, with the following exceptions:

In Parashant, impacts from closure and restrictions on the Mosby-Nay Allotment would be similar to Alternative B. Impacts from closing that portion of the Pakoon Allotment within the Pakoon DWMA would be similar to Alternative A; however, shortening the season of use

outside the DWMA would increase impacts to grazing permittees, even with possible ephemeral extensions. Impacts to the livestock operators involved would be major.

Impacts from managing the Pakoon Springs Allotment outside the DWMA as a forage reserve would maintain Animal Unit Months (AUMs), help stabilize livestock grazing in the area, and aid in minimizing resource impacts.

In the Arizona Strip FO, season of use and other management prescriptions consistent with achieving DFCs, as identified through the rangeland health assessment process, would be established (along with a management plan detailing specifics of grazing use) on the remaining portions of Littlefield Community and Mesquite Allotments. These restrictions could result in minor to moderate impacts on the normal, day-to-day livestock grazing operations of the grazing permittees involved.

In the Cedar Wash Allotment outside desert tortoise ACECs, ephemeral extensions would be authorized when conditions outlined in Guideline 3-5 of the Arizona Standards for Rangeland Health are met. Using the Guidelines would result in negligible to minor, if any, impacts to the day-to-day livestock grazing operations of the permittees involved

Impacts from Visual Resources

In Parashant, impacts resulting from Alternative C would be similar to impacts on livestock grazing management from VRM under Alternative A, although more intense and widespread as more VRM Class I and II would be assigned throughout the Planning Area, with the exception of Vermilion. Impacts, however, would be less intense compared to Alternative B.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be similar to those described under Alternative A

Impacts from Special Area Designations (ACECs)

The types of impacts would be similar to those discussed under Alternative A, except that they would be more widespread due to additional acres that would fall within expanded or newly designated ACECs, but not as widespread compared to Alternative B..

Impacts from Livestock Grazing

Designating the Pakoon Springs and Parashant allotments (Parashant) and the Tuweep Allotment (Parashant and Arizona Strip FO) as forage reserves would compliment restoration research and assist in stabilizing local livestock operations while accomplishing resource objectives on a landscape scale. Impacts to would be negligible to minor because AUMs would still be available

through either forage reserves or reconfiguration, which would help in stabilizing the livestock grazing in the area.

In Vermilion, the River pasture of the Lees Ferry Allotment would be managed as a forage reserve for livestock grazing, with a season of use from November 15 through March 1, and would not be used more than two years in five. The AUMs would be retained by the BLM and that portion of the pasture in Glen Canyon NRA would still be utilized as part of the pasture. Impacts would be negligible to minor.

Impacts from Recreation

Impacts would be similar to those discussed under Alternative B, with the exception that additional SRMAs and Extensive Recreation Management Areas (ERMAs) may concentrate recreation use in some areas but would also allow for more management to resolve conflicts between other uses, including livestock grazing operators.

Impacts from Lands and Realty

Impacts would be similar to those described under Alternative A.

Alternative D

Impacts from Trails and Travel Management

Under Alternative D, impacts from Primitive TMAs to livestock grazing would be similar to Alternative B, although less intense due to fewer acres under this TMA. Impacts to livestock grazing from implementing changes to roads open, roads closed, and roads open to administrative use only would be similar to Alternative B, except impacts would be less intense due to more roads open, fewer roads closed, and fewer administrative roads. Impacts would also be less intense than Alternatives C and E, but more intense than Alternative A.

Impacts from Wilderness Characteristics

Impacts in Parashant would be similar to those described under Alternative B, although less intense as it would involve fewer acres allocated for maintaining wilderness characteristics. Aside from Alternative A, Alternative D would have the least effect on livestock grazing among the alternatives. Impacts would be more localized and in the range of minor to moderate.

Impacts to livestock grazing in Vermilion would be the same as described under Alternative A because no acres would be allocated for wilderness characteristics.

In the Arizona Strip FO, the types of impacts would be the same as described under Alternative B, but more localized due to fewer acres proposed to be allocation of wilderness characteristics.

Impacts would be the same as under Alternative E due to similar acres that would be allocated for wilderness characteristics, which is considerably fewer acres than proposed under Alternative C, and would range from minor to moderate.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be similar to those described under Alternative B, with the exception that Alternative D would allow for treating more acres of sagebrush and pinyon-juniper sites; the most among the alternative, with the exception of Alternative A. Allowing more acres to be treated provides additional opportunities to maintain and improve watersheds and maintain or increase forage quality and quantity available to livestock in the long term. Overall impacts would be minor to moderate.

Under Alternative D, impacts from vegetation management in the Cane Springs pasture of the Mud and Cane Allotment would be the same as Alternative A.

Impacts from Air, Water, and Soil

Impacts would be similar to those described under Alternative B.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative C.

Impacts from Special Status Species

In Parashant, impacts from closing the Mosby-Nay Allotment would be the same as described under Alternative A. Under Alternative D, the Grand Gulch Wash portion of the Pakoon Allotment would be eliminated from the DWMA and open to grazing. As a result, 223 AUMs for that portion of the Pakoon Allotment would become available for grazing and range improvement projects would be allowed, which would result in positive, moderate impacts for the grazing permittees. However, the season of use would be reduced, decreasing some benefit from the additional AUMs, even with the possible ephemeral extensions.

Impacts in Vermilion would be similar to those described under Alternative A. Impacts in Arizona Strip FO would also be similar to those described under Alternative A, except that most of Mesquite (Littlefield Slope Pasture only), and Littlefield Community (Littlefield Slope Pasture only), and all of the Beaver Dam Slope, Highway, and Mormon Well grazing allotments would receive ephemeral extensions when conditions outlined in Guideline 3-5, of the Arizona Standards for Rangeland Health are met. Also, season of use in the Cedar Wash Allotment would increase by one month. These changes from Alternative A would result in a slight to limited change in the normal, day-to-day grazing operation by allowing the use of the additional

forage, when available. Impacts to the livestock grazing operations for those permittees involved would be positive and range from minor to moderate.

Impacts from special status species decisions concerning water developments in listed species habitats would be the same as described under Alternative B. With all impacts combined, Alternative D would have the least impacts to livestock grazing among the alternatives, with the exception of Alternative A.

Impacts from Visual Resources

In Parashant, impacts from VRM class assignments would be the same as described under Alternative B, although less intense due to fewer acres assigned to VRM Class I and II. Impacts would also be less intense than all other alternatives except Alternative A for the same reasons..

In Vermilion, VRM class assignments would be the same as described under Alternative B, except that VRM Class I would decrease and Class II would increase. Intensity of impacts under Alternative D would be the same as under Alternatives A .

In the Arizona Strip FO, impacts from VRM class assignments would be similar to those under Alternative B except impacts would be less intense as there would be fewer acres allocated to VRM Class I and II. Alternative D proposes the fewest acres in the Arizona Strip FO to be allocated as VRM I and II, making it the least impacting of all alternatives.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be similar to those described under Alternative A

Impacts from Special Area Designations (ACEC)

In the Arizona Strip FO, though livestock grazing impacts are similar to Alternative A, this alternative is the least impacting of all alternatives, in that there are fewer acres proposed for ACEC designation than Alternative A and it would only impact 17 grazing allotments compared to 29. This is accomplished by de-designating four existing ACECs and adjusting the size of the remaining ones.

Impacts from Livestock Grazing

Under Alternative D, the Pakoon Springs Allotment outside the DWMA (Parashant) and Tuweep Allotment (Arizona Strip FO) would be re-allocated or reconfigured, which would maintain the current AUMs available for livestock grazing. This action would have negligible effects to livestock grazing; in fact, reconfiguring the allotment could be beneficial to the adjacent permittees by making their grazing system more operable.

Designating the Parashant Allotment (Parashant) as a forage reserve would compliment restoration research and assist in stabilizing local livestock operations while accomplishing resource objectives on a landscape scale. Impacts would be negligible to minor because AUMs would still be available through either forage reserves or reconfiguration, which would help in stabilizing the livestock grazing in the area.

In Vermilion, impacts would be similar to those discussed under Alternative C, except that the River Pasture of the Lees Ferry Allotment would be closed to livestock grazing. Impacts would be major to the livestock grazing operator.

Impacts from Recreation

Impacts would be similar to those described under Alternative B, except that impacts concerning SRMAs/ERMAs would be similar to Alternative C.

Impacts from Lands and Realty

Impacts would be similar to those described under Alternative A

Alternative E: Preferred

Impacts from Trails and Travel Management

Impacts would be similar to those discussed under Alternative C.

Impacts from Wilderness Characteristics

In the Monuments, impacts from lands allocated to maintain wilderness characteristics would be most similar to those under Alternative C, although less intense due to slightly fewer acres that would be allocated. Thus, as under Alternative C, impacts would be moderate.

In the Arizona Strip FO, impacts would be similar to those discussed under Alternative D due to similar number of acres that would be allocated for wilderness characteristics.

Impacts from Vegetation and Fire and Fuels Management:

Due to the acres of sagebrush habitat that could be treated, impacts would be the same as described under Alternative C in Parashant and the same as Alternative D in Vermilion and the Arizona Strip FO.

Under Alternative E, depending on the proposed site management plan for the Cane Springs riparian area, impacts to the livestock grazing operation could range from negligible to minor as

riparian, wildlife habitat, historic and prehistoric resources, and future recreation uses are promoted or protected.

Impacts from Soil, Air, and Water

Impacts would be similar to those described under Alternative B.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative C.

Impacts from Special Status Species

In Parashant, impacts from closures and restrictions on the Mosby-Nay Allotment would be the same as described under Alternative D. Impacts from closures and restrictions on the Pakoon Springs Allotment and Pakoon Allotment would be the same as described under Alternative C, with the exception that access to the DWMA portion would be closed by fencing Ed's pond, which would cause additional hardships to the grazing permittee involved. Impacts to the remainder of the Pakoon Allotment would be similar to those described under Alternative C, with the exception that ephemeral extensions would be allowed until June 1, potentially benefiting the grazing permittee involved.

Impacts from Visual Resources

In the Monuments, impacts would be similar to those described under Alternative D.

In the Arizona Strip FO, impacts would be similar to those described under Alternative B, except less widespread as slightly fewer acres would be assigned to VRM Classes I and II. As a result, Alternative E would result in the greatest impacts to livestock grazing from VRM assignments among the alternatives except Alternative B.

Impacts from Minerals (Arizona Strip FO only)

Impacts would be similar to those described under Alternative A

Impacts from Special Area Designations (ACECs)

In the Arizona Strip FO, impacts would be similar to those described under Alternative B as the same number of allotments (44 allotments) would be affected, compared to Alternative A where 29 allotments would be impacted. However, fewer acres would be impacted under Alternative E.

Impacts from Livestock Grazing

Impacts from operating the Pakoon Springs and Parashant allotments (Parashant) and Tuweep Allotment (Parashant and Arizona Strip FO) as a forage reserve would be similar to Alternative C, minus the option to reconfigure. Impacts in Vermilion would be similar to those described under Alternative B.

Impacts from Recreation

Impacts would be similar to those described under Alternative C.

Impacts from Lands and Realty

Impacts would be similar to those described under Alternative A

Cumulative Impacts

The area of analysis for cumulative impacts is defined as the Planning Area and the surrounding communities in southern Utah and southeastern Nevada, within approximately 50 miles.

Recent changes to livestock management due to additional protective measures for threatened and endangered species resulted in major changes to livestock grazing operations. These protective measures resulted in the closures of the entire Tassi Allotment as well as portions of the Mosby-Nay, Pakoon Springs, and Pakoon allotments in the 1998 LUP amendment. All grazing preferences associated with these allotments, or portions thereof, were canceled, which resulted in the removal of 2,130 AUMS and some 127,500 acres for livestock grazing. In addition, all ephemeral extensions on the Beaver Dam Slope, Highway, and Mormon Well allotments and on the tortoise portion of the Mesquite and Littlefield allotments were canceled, which involved an additional 144,027 acres.

If Alternative B is implemented, several livestock grazing allotments in critical desert tortoise habitat would be closed to livestock grazing. These allotments include most of Mosby-Nay, Pakoon, and Pakoon Springs, most of Mesquite (Littlefield Slope Pasture only), and Littlefield Community (Littlefield Slope Pasture only), and all of the Beaver Dam Slope, Highway, and Mormon Well. A total of 201,917 acres would be unavailable for livestock grazing, resulting in the removal of 10,080 AUM's (including the reductions from the 1998 LUP amendment).

Under Alternative B, the Tuweep Allotment and the River Pasture of the Lees Ferry Grazing Allotment would also be closed to livestock grazing, which would result in an additional loss of 2,076 AUMs. Thus, cumulative impacts with respect to the 1998 LUP amendment and implementation of the most restrictive alternative in this Draft Plan/DEIS (Alternative B) could result in livestock grazing operators losing 12,156 AUMs within the Planning Area. A

reduction in 12,156 AUMs is equivalent to over 1,000 head of cattle yearlong that would no longer be allowed to graze on the public lands of the Arizona Strip District.

Closing these allotments and portions of other allotments would have a major effect on the economic viability of cattle operations within the Desert Tortoise DWMA and ACECs. These grazing operations depend on the use of public rangelands to sustain their base herds.

In addition, other resource protection designations, while varying by alternative, result in major impacts to livestock grazing in the Planning Area. Similar protective designations are in place and being developed in adjacent surrounding areas and throughout the west. These impacts stem from program activities that are restrictive and/or protective by nature, such as VRM Classes I and II, ACECs, threatened and endangered species, wilderness, and national monuments.

In the long term, as this plan is implemented and the surrounding area population increases along with changing sentiment, additional conflicts between livestock grazing and other uses could arise. Resolving conflicts would require more adjustments and/or restrictions placed on livestock grazing management. These new adjustments and/or restrictions would, in some degree, change the normal day-to-day livestock management. Eventually, permitted use would need to be modified district wide.

Other factors influence livestock grazing operations including climatic and market fluctuations. A six-year drought in the Planning Area occurred between 1998 and 2004 and dramatically effected livestock grazing operations on the Arizona Strip, resulting in virtually all cattle being pulled from the public lands on the Arizona Strip in 2004. Similar fluctuations in livestock numbers would occur in the future.

MINERALS

Mineral resources include fluid and solid minerals leased for development under the Mineral Leasing Act of 1920 and amendments, locatable minerals that may be claimed and patented under the 1872 Mining Law, and earth materials that may be purchased under the Mineral Materials Sales Act of 1947.

Leasable Minerals: Fluid minerals (oil and gas) are the only leasable commodities analyzed (See Appendix 4.B). No reasonable foreseeable development of geothermal resources, coal, sodium, potassium, or other leasable mineral resource is anticipated. If other leasable minerals are found in commercially exploitable deposits, the Arizona Strip FO would provide a program for development of such commodities. National Monuments and designated wilderness are closed to the exploration and development of leasable minerals.

The impact issues for fluid minerals result from management decisions for the protection of other resources. Constraints related to the fluid mineral leasing categories are presented in the form of stipulations as described in Appendix 2.O. The requirements of the stipulations can include, but

are not limited to, restrictions on seasonal access, designation of buffers around sensitive areas, or require other activities that would be critical to protecting a particular resource.

Resources potentially impacted by fluid mineral development are often protected by attaching a lease notice to lease contracts. A lease notice indicates what potential resources may be affected in a given lease and notifies the lessee that before ground disturbing activities occur, they must contact the BLM Authorizing Officer to find out what actions or mitigation may be needed to protect those resources. Noncompliance with the lease notice may result in revocation of the lease.

In general, the alternatives would affect fluid mineral development by varying the amounts of land available for leasing and the lease terms and conditions. Impacts can range from major (loss of minerals and revenues as a result of closure of lands to development) to negligible (activities conducted under standard lease terms and conditions).

Locatable Minerals: Management decisions and actions aimed at protecting other resources could result in the closure of lands available for locatable mineral exploration and development. Other issues include restrictions governing locatable mineral exploration and development.

In general, the alternatives would affect locatable mineral development by varying the amounts of land open to the operation of the mining laws and the areas open with restrictions or open with a plan of operation for each alternative. Impacts can range from major (loss of minerals and revenues as a result of closure of lands to development) to negligible (activities conducted under standard reclamation terms and conditions).

Mineral Materials: Management decisions and actions aimed at protecting other resources could also result in the closure of lands available for the extraction and disposal of mineral materials. Other impacts may result from restrictions governing the extraction and disposal of mineral materials.

In general, the alternatives would affect mineral material disposals by generally the amounts of land available for disposal sites and the areas open with restrictions. Impacts can range from major (loss of minerals and revenues as a result of closure of lands for mineral material disposal) to negligible (activities conducted under standard reclamation terms and conditions).

Methods and Assumptions

The analysis of potential impacts is based on review of existing literature, geologic maps, field trips, site visits, and information provided by non-planning team experts in the BLM, NPS, USGS, and other agencies. Analyses on mineral resources are also based on the expertise of BLM resource specialists at the Arizona Strip FO and the NPS staff at Parashant and Lake Mead NRA.

Effects are quantified where possible. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible:** The impact would be inconsequential. There would be no perceptible change in the availability of land for mineral development or to the economics of exploration and extraction.
- Minor:** The impact would be detectable. The beneficial or adverse impact would be measurable or perceptible, but it would only slightly affect the availability of land for mineral development or the economics of exploration and extraction.
- Moderate:** The impact would be readily apparent, either beneficial or adverse. There would be a significant, measurable, or perceptible change in the availability of land for mineral development or the economics of exploration and extraction.
- Major:** The impact would be severe. The adverse impact on mineral resources would be substantial. Actions would result in a dramatic change to the availability of land for mineral development or the economics of exploration and extraction.

The following assumptions have also been made:

Leasable Minerals: A reasonably foreseeable development scenario for oil and gas was developed in conformance with BLM Instruction Memorandum No. 2004-089 and can be found in Appendix 4.B. The reasonable foreseeable development scenarios were developed based on past exploration activities and reasonable estimates for future exploration and development given the following assumptions:

- On average, one Application for Permit to Drill (APD) has been received per year for the Planning Area. It is predicted this level of activity will continue over the next 20 years. No economic development or production of fluid minerals has occurred in the Planning Area.
- Approximately 7 acres will be disturbed per well by oil and gas drilling operations making the total area of related disturbance during this time period 140 acres. If reclamation is completed immediately following drilling and full re-vegetation takes 10 years, the maximum area disturbed at any one time would be 70 acres.
- Geophysical exploration operations would comply with the terms and conditions for notice of intent to conduct geophysical exploration provided on BLM Form 3150-4a. Notices of intent submitted for the conduct of geophysical surveys would be evaluated on a case-by-case basis.
- Lands in the Planning Area designated closed to fluid mineral leasing (Category 4) are National Monuments and designated wilderness. Split estate lands with federal subsurface mineral estate would be designated in the same oil and gas leasing category as adjacent lands.

Split estate lands with federal subsurface mineral estate in the Community Management Unit would be designated as no surface occupancy (Category 3).

Locatable Minerals:

- There would be no major regulatory changes in federal or state statutes, regulations, policy, or guidance that govern the exploration and development of locatable minerals.
- Commodity prices in the future would provide sufficient economic incentive to support the production of locatable mineral commodities.
- The level of activity during the previous 20 years is anticipated to continue over the life of this plan. Over the past 20 years six underground uranium mines and one surface gypsum mine were developed in the Planning Area.
- Typically uranium mines, from initial development to reclamation, last approximately 10 years. Disturbances at each mine site generally result in approximately 20 acres of surface area impacted. Given the assumption that this level of activity will continue over the next 20 years, the maximum area disturbed at any one time by uranium mining is expected to be approximately 120 acres.
- Economically viable gypsum mining within the Planning Area began in 1990. Over the past 10 years the area disturbed by gypsum mining has roughly doubled from about 100 acres to 200 acres. Reclamation of the disturbances created by the gypsum mine are concurrent with mining, however, the soil type has a low productive potential and may take more than 20 years for the native vegetation to re-establish. It is projected that at any one time, over the next 20 years, the mine will impact about 300 acres including pits, waste rock piles, processing facilities, roads, exploration drill pads and roads, and office facilities along with vehicle repair shops. Given the assumption that this level of activity will continue for the next 20 years, the maximum area disturbed at any one time by gypsum mining is expected to be approximately 600 acres.
- Total surface disturbance from locatable mining development during the planning period is anticipated to be 720 acres.

Mineral Materials:

- There would be no major regulatory changes in federal or state statutes, regulations, policy, or guidance that govern the exploration and development of mineral materials.
- Population growth would continue to increase in the communities within the Planning Area and in Washington County, Utah.
- The demand for mineral materials would depend on market conditions and would be expected to double during the planning period.
- Most of the mineral material sites in the Planning Area disturb less than 5 acres and would be reclaimed immediately after closing. Complete reclamation, including re-vegetation, may take up to 10 years. Currently, the total area impacted by the disposal of mineral materials is approximately 200 acres. It is anticipated this figure could double over the next 20 years and the total disturbance from mineral material disposal would reach approximately 400 acres.

Impacts to Mineral Resources

There would be no impacts to Monument mineral resources under any of the alternatives because the Monuments are withdrawn by their proclamations “from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the Monument.”

The establishment of the Monuments was subject to valid existing rights. Within the Monuments, there are currently no federal mineral leases, mining claims, or mineral interests that would constitute valid existing rights. Since no new federal mineral leases or prospecting permits may be issued, nor may new mining claims be located within the Monuments, mineral exploration and development would be excluded from within either Monument.

Existing material sites on BLM lands would continue to be used for BLM, NPS, and county road maintenance. New sites could be used on BLM lands in Parashant provided Monument objects are not impacted and the use is consistent with management unit and TMA objectives. In Vermilion, existing mineral material sites along House Rock Valley/Two Mile Road (1065) would be retained for administrative use for maintenance.

Impacts to mineral resources in the Arizona Strip FO would result from actions proposed under the following resource management programs:

- Wilderness Characteristics
- Air, Water, and Soil
- Special Status Species
- Visual Resources
- Minerals
- Special Area Designation
- Lands and Realty

Alternative A: No Action

Impacts from Special Status Species

Fluid Leasable Minerals: Seasonal restrictions placed to protect peregrine falcon, bighorn sheep and desert tortoise under Alternative A could have minor to moderate impacts on oil and gas exploration and development. Such restrictions could limit exploration, drilling, and other surface-disturbing activities, which could affect the timing and costs of such activities. Any predictable adverse impacts to special status species from leasable mineral requests could lead to modification of the proposal or denial of the request. Proposal modifications could affect

mineral operations by increasing associated costs and increasing the time needed to permit and conduct operations.

Locatable Minerals: Requiring a plan of operation for mineral development in any lands or waters known to contain federally proposed or listed threatened or endangered species or their proposed or designated critical habitat could increase the cost and time needed to complete some exploration activities. Impacts would range from negligible to minor.

Mineral Materials: Closing areas containing special status species or their habitats to mineral material disposals would have major impacts to mineral material exploration and development.

Impacts from Soil, Air, and Water

Locatable Minerals: Under Alternative A, dust control would be required for compliance with the Arizona Department of Environmental Quality laws, rules, and policies for the surface mining of gypsum. Such dust control would place a significant expense on the mining and processing of gypsum. Overall impacts to locatable minerals would be moderate.

Impacts from Visual Resources

Fluid Leasable Minerals: Under Alternative A, visual resources are classified as fluid mineral leasing Category 3 (no surface occupancy) in the vicinity of Kanab Creek; Hurricane Cliffs; Diamond Butte; upper and lower Grand Wash Cliffs; Parashant, Andrus, Hidden, Grama, and Dansil canyons; Moccasin Mountains; and the north slopes of Mokiatic and Seegmiller mountains. No surface occupancy restrictions significantly increase the cost and time needed to complete exploration and development activities and may cause the costs of exploration and extraction to escalate to the point where the economics of oil and gas development would be marginal. Impacts would range from moderate to major in those areas where no surface occupancy applies.

Mineral Materials: The disposal of mineral materials in VRM Class II areas would not be allowed if reasonable alternative sources are available. Impacts on exploration and development of mineral materials would range from negligible to minor.

Impacts from Minerals

Fluid Leasable Minerals: Designating lands as Category 1 would result in negligible to minor impacts as restrictions would be minimal. Designating lands as Category 2 would cause minor to moderate impacts as special terms or seasonal restrictions tend to increase the cost and time needed to complete exploration and development activities. Designating lands as Category 3 lands would result in moderate to major impacts due to no surface occupancy restrictions. Designating lands as Category 4 would be major as closing lands to fluid mineral leasing precludes the extraction of oil and gas resources.

Locatable Minerals: Designating lands as open to the operation of the mining laws would have negligible impacts as this is the least restrictive category. Designating lands as open to the operation of the mining laws with restrictions would have negligible to minor impacts as increased restrictions tend to increase the cost and time needed to complete mineral exploration and development. Designating lands as open to the operation of the mining laws with a plan of operation would have negligible to minor impacts as this designation may increase the cost and time needed to approve some small scale mineral exploration activities; however, there would be no impacts to mineral development and production since a plan of operations is required for these activities. Designating lands as closed to the operation of the mining laws would have major impacts since no mineral exploration and development could occur.

Mineral Materials: Designating lands as open to mineral material disposals subject to standard terms and conditions would have negligible impacts as this is the least restrictive category. Designating lands as open to mineral material disposals subject to restrictions would have negligible to minor impacts as restrictions tend to increase the cost and time needed to complete exploration, development and marketing activities. Designating lands as closed to mineral material disposal would cause major impacts as these materials would not be available for use.

Impacts from Special Area Designation

Fluid Leasable Minerals: Under Alternative A, various levels of impacts would occur from special area designations. Designating ACECs, which are classified as Category 1, Category 2 or Category 3 for fluid mineral leasing, would result in negligible to major impacts, depending on the resources being protected. The Virgin River Gorge scenic withdrawal would retain its Category 3 classification, which would result in moderate to major impacts due to the no surface occupancy restrictions.

Locatable Minerals: Under Alternative A, the Grand Canyon Game Preserve and Virgin River Gorge scenic withdrawal would be closed to the operation of the mining laws, which would result in major impacts since no mineral exploration and development could occur.

Mineral Materials: Under Alternative A, all ACECs would be closed to mineral material disposal, with the exception that existing material sites would be evaluated for retention in Johnson Spring, Lost Spring Mountain, and Moonshine Ridge ACECs. Impacts would be moderate to major since these resources in lands designated closed to mineral material disposal would not be available.

Impacts from Wilderness Characteristics

No acres would be allocated for wilderness characteristics under Alternative A.

Impacts from Lands and Realty

Land ownership adjustments could have minor to moderate impacts on the minerals program because the acquisition of state and private lands could have a positive impact on the development of mineral resources that may underlie these lands. A significant proportion of these lands are located in areas that show a high potential for locatable minerals, such as uranium, and a moderate potential for leasable minerals, such as oil and gas.

Conversely, the disposal of public lands could negatively affect prospective mineral development. The majority of the lands that would be disposed of are located in areas identified as having high potential for locatable minerals and moderate potential for oil and gas. Once these lands leave public ownership and become developed, the likelihood of mineral exploration on the tracts would be minimal. Without exploration, any mineral resources that may underlie the tract would probably not be developed throughout the life of this Plan.

Alternative B

Impacts from Special Status Species

Impacts would be the same as those described under Alternative A, except that the impacts to Fluid Leasable Minerals would not be as widespread as there would be no seasonal restrictions exploration, drilling, and other surface-disturbing activities to protect peregrine falcons and bighorn sheep.

Impacts from Soil, Air, and Water

Impacts would be the same as those described under Alternative A.

Impacts from Visual Resources

Fluid Leasable Minerals: As the specific no surface occupancy restrictions would not apply to the areas described under Alternative A, impacts to fluid leasable minerals under Alternative B would be minor to moderate.

Mineral Materials: The types of impacts would be the same as described under Alternative A; however, impacts would not be as widespread under Alternative B as fewer acres would be assigned to VRM Class II.

Impacts from Minerals

Fluid Leasable Minerals: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative B as fewer acres

would be designated as Category 1 and 3, while more acres would be designated as Category 2. Nearly the same acres would be designated as Category 4, which would result in similar distribution of impacts.

Locatable Minerals: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative B as fewer acres would be designated open to the operation of the mining laws (both with and without restrictions) and more acres would require a plan of operation. The same number of acres would be closed to the operation of mining laws, which would result in the same intensity and distribution of impacts as under Alternative A.

Mineral Materials: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative B as fewer acres would be designated open subject to standard terms and conditions, more acres would be designated open subject to restrictions, and more acres would be designated closed to mineral material disposal. Because of the additional closures, Alternative B would result in more widespread major impacts.

Impacts from Special Area Designation

Fluid Leasable Minerals: Under Alternative B, all ACECs would be designated fluid mineral leasing Category 2, which would result in minor to moderate impacts since additional special terms or seasonal restrictions tends to increase the cost and time needed to complete exploration and development activities. Impacts would be more widespread as there would be more acres under ACEC designations under Alternative B. Impacts in areas designated as Category 1 under Alternative A would be less intense designated as Category 2 under Alternative B.

Locatable Minerals: Impacts would be the same as those described under Alternative A.

Mineral Materials: Under Alternative B, all ACECs would be closed to mineral material disposal, which would result in moderate to major impacts. Although more acres would be under ACEC designation than under Alternative A, impacts would be similar as the proposed ACECs excluding existing mineral material sites.

Impacts from Wilderness Characteristics

Fluid Leasable Minerals: Under Alternative B, 46,135 acres would be allocated to maintain wilderness characteristics. These lands would be open to oil and gas leasing subject to no surface occupancy (Category 3), which would result in moderate to major impacts. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed disturbance or occupancy would not substantially impair the wilderness characteristics

of the area. Under this alternative, restrictions would apply to approximately 21,565 acres of land with a moderate potential for oil and gas.

Mineral Materials: While lands that would be managed for wilderness characteristics would be closed to mineral material disposals under Alternative B, such areas are remote, without roads, and without demand for mineral material. Impacts would thus be negligible.

Impacts from Lands and Realty

Impacts would be the same as those described for Alternative A, with the exception that more acres of state and private lands are proposed for acquisition, and fewer acres of public lands are proposed for disposal, which would benefit the minerals program.

Alternative C

Impacts from Special Status Species

Impacts would be the same as those described under Alternative B.

Impacts from Soil, Air, and Water

Impacts would be the same as those described under Alternative A.

Impacts from Visual Resources

Fluid Leasable Minerals: Impacts would be the same as described under Alternative B

Mineral Materials: The types of impacts would be the same as described under Alternative A; however, impacts would be less widespread than under both Alternatives A and B as fewer acres would be assigned to VRM Class II under Alternative C.

Impacts from Minerals (Arizona Strip FO only)

Fluid Leasable Minerals: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative C as more acres would be designated as Categories 1 and 2 and fewer acres would be designated as Category 3. Impacts from Category 4 designations would be similar to those described under Alternative A due to similar number of acres involved

Locatable Minerals: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative C as fewer acres would be designated open and more acres would be designated open with restrictions or with a

plan of operation. Impacts from acres designated closed would be the same as under Alternative A due to a similar number of acres involved.

Mineral Materials: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative C as more acres would be designated open subject to standard terms and conditions, fewer acres would be designated open subject to restrictions, and more acres would be designated closed.

Impacts from Special Area Designation

Impacts would be similar to those described under Alternative B; however, impacts would be less widespread under Alternative C as there would be fewer acres under ACEC designation.

Impacts from Wilderness Characteristics

Fluid Leasable Minerals: The types of impacts would be similar to those described under Alternative B; however, impacts would be more widespread. Under Alternative C, no surface occupancy restrictions would apply to approximately 51,665 acres of land with a moderate potential for oil and gas, which is nearly twice as many acres compared to Alternative B.

Mineral Materials: Impacts would be similar to those described under Alternative B.

Impacts from Lands and Realty

Impacts would be similar to those described under Alternative B.

Alternative D

Impacts from Special Status Species

Impacts would be the same as those described under Alternative B.

Impacts from Soil, Air, and Water

Impacts would be the same as those described under Alternative A.

Impacts from Visual Resources

Fluid Leasable Minerals: Impacts would be the same as described under Alternative B.

Mineral Materials: The types of impacts would be the same as described under Alternative A; however, impacts would be less widespread than under all alternatives, including Alternatives A, as the fewest acres would be assigned to VRM Class II under Alternative D.

Impacts from Minerals (Arizona Strip FO only)

Fluid Leasable Minerals: Impacts would be similar to those described under Alternative C.

Locatable Minerals: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative D as fewer acres would be designated open and more acres would be designated open with restrictions or with a plan of operation. Impacts from acres designated closed would be the same as under Alternative A due to a similar number of acres involved.

Mineral Materials: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative C as more acres would be designated open subject to standard terms and conditions and fewer acres would be designated open subject to restrictions or designated closed.

Impacts from Special Area Designation

Impacts would be similar to those described under Alternative B, although less intense than both Alternatives B and C due to fewer acres that would be under ACEC designation.

Impacts from Wilderness Characteristics

Fluid Leasable Minerals: The types of impacts would be similar to those described under Alternative B; however, impacts would be less widespread than both Alternatives B and C. Under Alternative D, no surface occupancy restrictions would apply to approximately 21,729 acres of land with a moderate potential for oil and gas, which is roughly half as many acres compared to Alternative B and a quarter as many acres compared to Alternative C.

Mineral Materials: Impacts would be the same as described under Alternative B

Impacts from Lands and Realty

Impacts would be similar to those described under Alternative B.

Alternative E: PreferredImpacts from Special Status Species

Impacts would be similar to that described under Alternative B.

Impacts from Soil, Air, and Water

Impacts would be the same as those described under Alternative A.

Impacts from Visual Resources

Fluid Leasable Minerals: Impacts would be the same as described under Alternative B.

Mineral Materials: The types of impacts would be the same as described under Alternative A; however, impacts would be less widespread than under Alternatives A and B but more widespread than Alternatives C and D due to the number of acres assigned to VRM Class II under Alternative E.

Impacts from Minerals (Arizona Strip FO only)

Locatable Minerals: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative E as fewer acres would be designated open or open with restriction and more acres would be open with a plan of operation. Impacts from acres designated closed would be the same as under Alternative A due to a similar number of acres involved.

Mineral Materials: The types of impacts would be the same as compared to Alternative A; however, the overall distribution of impacts would vary under Alternative E as fewer acres would be designated open subject to standard terms and conditions and more acres would be designated open subject to restrictions or would be designated closed.

Impacts from Wilderness Characteristics

Impacts would be similar to those described under Alternative D.

Mineral Materials: Impacts would be similar to those described under Alternative B.

Impacts from Lands and Realty

Impacts would be similar to those described under Alternative B.

Cumulative Impacts

The geographic area of analysis for cumulative impacts to minerals is the Planning Area. Population growth and development would continue to increase the demand for land and for minerals. As the communities in Clark and Lincoln counties, Nevada, and in Washington County, Utah continue to expand, more emphasis would be on clean air and water, which would

increase the pressure on mining industries to use more methods to produce minerals while leaving the surrounding environment cleaner. This could impact gypsum mining south of St. George, Utah. As the price of uranium continues to climb, it could be expected that the uranium mines on the Arizona Strip would be reopened and operated and others would be opened. Because they are located primarily in remote locations on the Arizona Strip, they would not be as affected by the growing communities as the gypsum industry.

RECREATION AND VISITOR SERVICES/INTERPRETATION AND ENVIRONMENTAL EDUCATION

This section presents potential impacts of the alternatives on outdoor recreation and visitor services as determined through potential changes to visitor and community resident preferences (activities, experiences, benefits), recreation setting conditions (physical, social, administrative), recreation management (resources, signing, facilities), recreation marketing (visitor services, information, interpretation and environmental education), recreation monitoring (inventory, monitoring), and recreation administration (permits and fees, and visitor limits and regulations) as they are described in Chapter 3. These recreation features are interrelated and connected to access. For example, changes in recreation settings would result in corresponding changes in opportunities to achieve desired recreation experiences and associated benefits, influenced by access.

Recreational experiences and the potential attainment of a variety of beneficial outcomes are vulnerable to any management action that would alter the settings and opportunities in a particular area. Recreation settings are based upon a variety of attributes, such as remoteness, the amount of human modification in the natural environment, evidence of other users, restrictions and controls, and the level of motorized vehicle use. Management actions that greatly alter such features within a particular portion of the Planning Area could affect the capacity of that landscape to produce appropriate recreation opportunities and beneficial outcomes.

Methods and Assumptions

The analysis of potential impacts to recreation is based, in part, on visitor use reporting statistics from the Arizona Strip FO and the Recreation Management Information System (RMIS), which provide information on the number and types of recreational use. Spatial/GIS information was also used in this analysis and includes wildlife habitat boundaries, wilderness characteristic boundaries, transportation inventory, transportation designations, ecological zones, vegetation types, recreation sites, historic and recreational trails, and known historical/cultural sites. In the absence of data, analyses were based on the expertise of recreation planners at the Arizona Strip District Office. Combined, these experts possess an extensive knowledge of recreation resources within the Planning Area. The impact analysis is also based on review of existing literature and information provided by non-planning team experts in the BLM, NPS, and other agencies.

Effects are quantified where possible. In absence of quantitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible:** The impact would not be detectable. Changes to recreation settings and opportunities would only affect the experiences of a small number of recreational users.
- Minor:** The impact would be detectable. Changes to recreation settings and opportunities would affect the experiences of larger, but not significant number of recreational users
- Moderate:** The impact would be readily apparent. Changes to recreation settings and opportunities would affect the experiences of a large number of recreational users.
- Major:** The impact would be severe. Changes to recreation settings and opportunities would affect the experiences of a majority of recreational users.

Impacts to recreation settings and opportunities would result from actions proposed under the following resource management programs:

- Trails and Travel Management/Transportation Facilities
- Wilderness Characteristics
- Vegetation and Fire and Fuels Management
- Fish and Wildlife
- Special Status Species
- Visual Resources
- Cultural Resources
- Livestock Grazing
- Recreation and Visitor Services/Interpretation and Environmental Education

Alternative A: No Action

Impacts from Trails and Travel Management/Transportation Facilities

TMA Delineation: No TMAs would be identified under Alternative A.

OHV Area Designations: Under Alternative A, due to the nature of the existing OHV area designations in the entire Planning Area, motorized and mechanized cross-country vehicle travel would continue to be generally prohibited, with exceptions for certain agency and permitted uses. The exception to this is one small area near Fredonia which would be designated “open,” where all types of vehicle use is permitted at all times, anywhere in the area subject to the

operating regulations and vehicle standards set forth in various CFR sections. In the Monuments, all vehicles and bicycles would be restricted to designated roads, pending route designation. While this could eventually restrict OHV use to fewer, but specific roads and trails, OHV users would continue to have access to the existing road network until such designations were made. This would maintain the existing recreation opportunities in the Monuments for a significant period of time, which would benefit motorized users and those local businesses that rely on them. However, because of rapid growth in the St. George area, and the corresponding increase in OHV sales, maintaining existing recreation opportunities and social settings could also have minor to moderate impacts on non-motorized users due to potential increases in motorized use.

Similar impacts to both motorized and non-motorized users would occur on the Arizona Strip FO, but because vehicles would have access to all existing roads and trails for up to 5 years, pending long-term route designations, such impacts would last for a longer period.

Route Designations: Under Alternative A, 2,183 miles of roads would remain open to motorized travel in the Monuments and no roads would be closed. This would preserve existing available opportunities for motorized recreational use and current recreational settings would remain unchanged. This would result in moderately beneficial impacts on motorized recreational users and those businesses that support them. However, because of rapid growth in the St. George area, and the corresponding increase in OHV sales, maintaining existing recreation opportunities and social settings in their current condition could also have minor to moderate impacts on non-motorized users due to potential increases in motorized use.

Similar impacts to both motorized and non-motorized users would occur on the Arizona Strip FO, but because vehicles would have access to all existing roads and trails for up to 5 years, pending long-term route designations, such impacts would last for a longer period.

Trail Construction: No decision under this alternative.

Wheeled Game Carriers: Allowing non-motorized, wheeled game carriers to retrieve game kills in all areas of the Monuments and Arizona Strip FO lands except designated and NPS proposed wilderness would be a continuation of current regulations that enhance hunting opportunities.

Impacts from Wilderness Characteristics

No areas would be managed for wilderness characteristics under Alternative A.

Impacts from Vegetation and Fire and Fuels Management

Depending on the type, scope, and intensity, vegetation treatments could directly impact recreation settings and, therefore, visitor experiences and the possible realization of specific

benefits, in both the Monuments and the Arizona Strip FO. Impacts in treated areas could range from negligible to moderate. The duration of the impacts would be dependent on the type of treatment being applied. In the long term, having a full range of tools for restoring the landscape to its natural condition would enhance recreation experiences and settings.

Impacts from Fish and Wildlife

Improving wildlife habitat where needed would help maintain viable game populations. This could benefit hunters and those seeking wildlife watching opportunities. Depending on the scope and intensity of habitat improvement efforts, impacts to recreational opportunities could be mixed. Physical recreational settings could have impacts similar to those described in the Impacts to Vegetation section. Those impacts could range from negligible to moderate. Any increases in game populations and other wildlife populations could enhance hunting and wildlife watching opportunities. Those impacts could also range from negligible to moderate.

Impacts from Special Status Species

Under this alternative, existing road closures and camping restrictions related to desert tortoise could have a negligible to minor effect on recreational opportunities in Parashant and the Arizona Strip FO.

Impacts from Visual Resources

Under Alternative A, the entire Vermilion would remain assigned to VRM Class I or II. Such designations involve stringent design parameters and/or project mitigation on most developments/disturbances that could affect solitude, naturalness, and primitive/unconfined recreation. Some projects could still be allowed that could result in localized impacts, which would range from negligible to minor, depending on the type of project. In contrast, Parashant and the Arizona Strip FO would have significant acreage classified as VRM Class III and IV, which would allow for more landscape modifications than VRM Classes I or II. Projects that may be approved under VRM Class III or IV include vegetation treatments, communications towers, and range developments. Impacts would be long-term, and depending on what projects are proposed, could range from minor to major.

Impacts from Cultural Resources

Under Alternative A, current designations of public use sites in the Monuments and the Arizona Strip FO would maintain existing opportunities for visitors to enjoy historic or prehistoric cultural resources.

Impacts from Livestock Grazing

Livestock grazing can impact recreation settings and opportunities. The presence of livestock could cause recreational users to avoid those areas where cattle are present. In general, grazing impacts to recreational settings and opportunities would be localized, seasonal, and range from minor to moderate, depending on the number of livestock present. Under Alternative A, the majority of both Monument and the Arizona Strip FO would remain open to grazing.

Impacts from Recreation and Visitor Services/Interpretation and Environmental Education

Special Recreation Management Areas and Extensive Recreation Management Areas:

Under Alternative A, all existing SRMAs would retain their current status. Full implementation of existing SRMA objectives through the development of activity plans would provide visitors higher quality recreation opportunities through the more focused and effective management of the desired settings, activities, and experience opportunities appropriate for each SRMA.

Impacts to recreation settings would range from minor to moderate.

Under this alternative, an emphasis would be placed on maintaining existing recreation settings and opportunities. In the long term, moderate impacts could result as visitation increases due to a rapidly expanding population in southern Utah. Potential user conflicts and degradation of the resource settings due to overuse are possible.

Signing and Facilities: Signing and other forms of visitor information could enhance public safety and improve recreational user experiences. Impacts from improvements would be positive and range from minor to moderate.

Recreation Marketing Actions: Under Alternative A, visitors would be provided accurate information regarding recreation opportunities, interpretation of natural and human history, and specific rules and regulations pertaining to their use of the Monuments and the Arizona Strip FO. Impacts from improvements would be positive and range from minor to moderate.

Interpretation and Environmental Education: No decisions under this alternative.

Visitor Limits and Regulations: Under Alternative A, management responses to unacceptable resource and/or social condition would range from the least restrictive methods (e.g., information and education) to most restrictive (e.g., visitor limits, supplemental rules, or restrictions), with emphasis given to using the least restrictive methods. Such responses would be instituted only when monitoring indicates a trend toward unacceptable change to desired recreation settings brought about by such use. By monitoring and addressing resource/social changes before they become unacceptable, taking preemptive action could result in long-term maintenance of recreational settings. Impacts would be positive and range from minor to moderate.

Camping: Non-motorized, dispersed camping would be allowed, although potential limits could be placed in listed species and other sensitive habitats. Visitors would be allowed to collect dead and down wood for campfires in areas where fires are allowed. Impacts to recreation settings and opportunities would be minor.

Geocaching: On-the-ground placement of geocaches would be prohibited in archeological sites, alcoves, rock shelters, threatened and endangered species habitat, raptor nesting sites, designated and NPS proposed wilderness areas, or where identified Monument objects would be at risk. This would place restrictions on where geocache enthusiasts could locate their caches. Impacts to recreational users would be minor.

Permits and Fees: Under Alternative A, by using monitoring data and involving the public in any decisions to establish new permits, fees, visitor limits, regulations, or other restrictions, management response to unacceptable resource/social condition changes would be measured and appropriate. Impacts to recreational settings and experiences would likely be enhanced and these impacts could range from minor to moderate.

SRP Administration: Given substantial increases in workload due to an expanding population and the increasing attraction of the Monuments, the current case-by-case authorization of commercial, competitive, and vending permits is inefficient. This process may eventually preclude many local and regional recreation providers from making available certain recreation opportunities to serve a growing demand. Impacts to recreational providers could be moderate.

Alternative B

Impacts from Trails and Travel Management

TMA Delineation: Under Alternative B, over 85 percent of the Monuments would be delineated as the Primitive TMA, which is the most restrictive of the alternatives. Under this alternative, opportunities for motorized recreation would decrease significantly in the Monuments, having major impacts on recreational OHV use and the businesses in nearby communities that cater to those users. This alternative would also concentrate steadily increasing motorized use into fewer access corridors, creating the potential for conflicts between users and a general degradation of the social aspects of backcountry motorized experiences. Conversely, opportunities for non-motorized recreational use would increase dramatically. These impacts would be moderate to major for non-motorized users such as hikers, equestrians, and mountain bikers and the businesses that support them.

With a preliminary route network in place on the majority of the Arizona Strip FO lands for up to 5 years, existing conditions change very little by alternative; thus, any impacts to motorized or non-motorized recreation would be negligible.

OHV Area Designations: Impacts in the Monuments would be the same as described under Alternative A. Because the entire Arizona Strip FO would eventually be subject to route designation under Alternative B, impacts in the Arizona Strip FO would be identical to those described for the Monuments under Alternative A.

Route Designations: Under Alternative B, 1,716 miles of roads would remain open to motorized travel in the Monuments, a 21 percent reduction in access compare to Alternative A. Under this alternative, opportunities for motorized recreation would decrease greatly in the Monuments, generating moderate to major impacts on recreational OHV use and related businesses in nearby communities that cater to those users. This alternative would also concentrate steadily increasing motorized use to fewer roads, creating the potential for conflicts between users and a general degradation of the backcountry motorized experience. Conversely, opportunities for non-motorized recreational use would increase dramatically. These impacts would be major for non-motorized users like hikers, equestrians and mountain bikers and the related businesses that support them.

The same impacts described in Alternative A would affect both motorized and non-motorized users on Arizona Strip FO lands in the short-term. In the long-term, impacts would be the result of future route designations, which are described above under OHV Area Designations.

Trail Construction: Under Alternative B, trail construction (non-motorized) in the Monuments would be considered only when needed to protect sensitive resources. This action would limit non-motorized opportunities. However, considering the number of roads proposed to be limited to administrative motorized uses only under this alternative, the number of potential routes for hiking, equestrian, and biking could increase dramatically, making the impacts from this decision negligible.

Wheeled Game Carriers: Impacts would be the same as described under Alternative A.

Impacts from Wilderness Characteristics

Under Alternative B, approximately 508,052 acres in the Monuments would be managed with the goal of maintaining existing wilderness characteristics. This is the most acreage of all alternatives. Implementation of this alternative would result in major impacts to recreational settings and opportunities. Due in part to potential route designations, large areas that exist as semi-primitive motorized settings would, in effect, become semi-primitive non-motorized, in terms of remoteness, effectively reducing motorized recreational opportunities. Conversely, non-motorized settings would expand and opportunities for primitive, unconfined recreation would increase dramatically. It should be noted that although the area available for non-motorized recreation would increase, because of the large number of closed roads, motorized access to many of these areas would become more difficult.

In the Arizona Strip FO, approximately 46,135 acres would be managed with the goal of maintaining wilderness characteristics. The types of impacts to settings and opportunities would be similar to those in the Monuments, but because of the relatively small acreage, impacts would be negligible to minor. This is true for both motorized and non-motorized recreation. It should be noted that many of the lands prescribed for management of wilderness characteristics in the Arizona Strip FO under this alternative are prescribed for management as components of proposed ACEC designations, not as stand-alone areas.

Impacts from Vegetation and Fire and Fuels Management:

Under Alternative B, vegetation treatments would be greatly restricted in their scope and intensity in both the Monuments and the Arizona Strip FO. Recreation settings and experiences could suffer negligible to minor short-term impacts during any application period.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative A.

Impacts from Special Status Species

Under Alternative B, further limits or restrictions could be applied on certain recreation activities or uses that degrade any special status species habitat or causes injury or mortality to such species. In special status plant habitats, recreational opportunities would be limited to smaller-capacity, designated areas and hiking and biking would be allowed only on designated routes. Such actions would cause a minor reduction in recreational opportunities in Parashant and the Arizona Strip FO.

Impacts from Visual Resources

Under Alternative B, both Parashant and Vermilion would experience similar impacts as described for Vermilion under Alternative A as all lands in both Monuments would be designated as VRM Class I or II. The majority of acreage for the Arizona Strip FO would be assigned to VRM Class III, which would result in impacts similar to those described under Alternative A.

Impacts from Cultural Resources

Impacts would be similar to those described under Alternative A, except more widespread as additional public use sites would be designated.

Impacts from Livestock Grazing:

The types of impacts would be similar to those described under Alternative A. In Vermilion, the Paria Canyon and Coyote Buttes permit areas would be closed to grazing, which could affect up to 10,000 visitors annually. Removal of all livestock from these areas would be seen as a positive step by many recreational users of the area. Impacts from this action would be moderate to major. In Parashant and the Arizona Strip FO, several allotments would be subject to closures or seasonal restrictions, with the resulting improvement to recreational settings associated with reduced grazing. These impacts would be moderate. Overall, due to additional allotment closures and restrictions, Alternative B could enhance recreation opportunities and settings to the greatest degree compared to all other alternatives.

Impacts from Recreation

Special Recreation Management Areas and Extensive Recreation Management Areas:

Under Alternative B, the current land-use planning handbook (H-1601-1, Appendix C. II. C.) approach to managing SRMAs would be used. Rather than focus on more intensive management of certain activities in a specific area, SRMA management would involve other recreation providers in the area/region, and each SRMA would target a specific primary recreation-tourism market (Community, Destination or Undeveloped) based on demonstrated market demand. The general focus would be to produce recreation opportunities, the fulfillment of which generates visitor experiences, which should allow visitors, communities, and the environment to realize beneficial outcomes. Such management would be accomplished by maintaining or enhancing the recreation setting conditions in which recreation activities take place, thereby producing the desired outcomes. The impacts to SRMAs proposed under this alternative could range from minor to major.

Signing and Facilities: Under Alternative B, impacts would be similar to Alternative A, except that major visitor facilities (visitor center or contact stations) would not be constructed within the Planning Area.

Recreation Marketing Actions: Impacts would be similar to Alternative A, although additional resource information (e.g., maps, brochures, safety information, driving tour guides, internet, etc.) would be distributed under Alternative B. This information would further assist visitors in having safe and enjoyable experiences. It could also spark increased visitation by attracting people to the area who would otherwise be unlikely to visit. This is especially true of those individuals who learn of recreation opportunities in the Monument over the Internet.

Interpretation and Environmental Education: Under Alternative B, information, interpretation, and environmental education would be more readily available, enhancing benefits to recreation experiences and serving as a management tool that could be used to mitigate

resource and social impacts, reducing the need to use tighter restrictions. These impacts would be positive and moderate.

Visitor Limits and Regulations: Impacts would be similar to those discussed under Alternative A, with the exception that management responses to unacceptable resource and/or social condition would be used only when carrying capacities are exceeded. Compared to Alternative A, this would restrict the use of preemptive management techniques to limit or prevent impacts before they become problems. Long-term impacts to recreation settings under this alternative could range from minor to major, with high-use areas at the upper end of the scale.

Camping: Under Alternative B, no off-road vehicle camping would be allowed, and vehicle camping along designated routes would be allowed in designated sites only. This action could reduce availability of some existing campsites. Collection of dead and down wood for campfires would not be allowed. Such actions could have moderate to major impacts on recreational users.

Geocaching: Under Alternative B, geocache sites would be removed if, through monitoring, it were determined that important resources would be at risk of unacceptable change due to use of the sites. The impact to affected users would be minor.

Permits and Fees: Impacts would be similar to those described under Alternative A.

SRP Administration: Under Alternative B, shifting the SRP administration to an annual schedule would enhance the efficiency of BLM planners and would allow local and regional recreation providers to make more effective long-range plans. Annual training of permitted outfitters would reduce the potential for resource and social impacts. Impacts to recreational settings, users, and outfitters would be positive and moderate.

Alternative C

Impacts from Trails and Travel Management

TMA Delineation: Under Alternative C, there would be more acres in the Monuments available for motorized recreational use compared to Alternative B, and less acres compared to Alternative A. This reduction could have minor to moderate impacts on recreational OHV use and the businesses in nearby communities that cater to those users. Consequently, opportunities for non-motorized recreational use would increase slightly. These impacts would be minor for non-motorized users like hikers, equestrian, and mountain bikers and the businesses that support them.

Impacts in the Arizona Strip FO would be similar to those discussed under Alternative B.

OHV Area Designations: Impacts in the Monuments would be the same as described under Alternative A. For the Arizona Strip FO, impacts would fall somewhere between Alternative A

and Alternative B. Under this alternative, 35 percent of the Arizona Strip FO would be subject to route designation, while 61 percent would remain limited to existing roads and trails. Approximately 4% would be closed and less than 1% would be open. In the areas where no route designation takes place, motorized use could be expected to increase, while access to designated areas may decrease due to potential route closures. This could have minor impacts on motorized recreation visitors as the overall availability of routes may decrease slightly over the life of the Plan. It could also have mixed impacts on non-motorized recreation visitors as areas that undergo route designation may offer more opportunities to pursue non-motorized activities, while areas that would be exempt from route designation may have decreased opportunities for quality non-motorized activities. Overall impacts to non-motorized recreation would be minor.

Route Designations: Under Alternative C, 1,997 miles of roads would remain open to motorized travel in the Monuments, a significant increase over Alternative B, but still 186 miles less than what is available under Alternative A. This reduction could have minor to moderate impacts on recreational OHV use and the businesses in nearby communities that cater to those users. Conversely, opportunities for non-motorized recreational use would increase slightly. These impacts would be minor for non-motorized users like hikers, equestrian, and mountain bikers and the businesses that support them.

The same impacts described under Alternative A would affect both motorized and non-motorized users on Arizona Strip FO lands in the short-term. In the long-term, impacts would be the result of future route designations, which are described under the section on OHV Area Designations.

Trail Construction: Under Alternative C, trail construction (non-motorized) would be the minimum necessary to achieve plan provisions. This allows trail construction to occur when and where it is needed, which could result in an appropriate increase in non-motorized trail use. The impacts from this decision would be minor.

Wheeled Game Carriers: Impacts would be the same as described under Alternative A.

Impacts from Wilderness Characteristics:

Under Alternative C, approximately 266,739 acres in the Monuments would be managed with the goal of maintaining wilderness characteristics. This is slightly more than half of what is proposed in Alternative B and less than twice what is proposed in Alternative D. The impacts to settings and opportunities would be the same as those described in Alternative B, but the degree of impact to both motorized and non-motorized recreation would be significantly less. It should be noted that although the area available for non-motorized recreation would be significantly less under this alternative, access routes to these areas have been preserved, effectively expanding opportunities.

In the Arizona Strip FO, approximately 77,575 acres would be managed with the goal of maintaining wilderness characteristics. The types of impacts to settings and opportunities would

be similar to those described in Alternative B. In the long term, having a greater range of tools for restoring the landscape to its natural condition would enhance recreation experiences and settings.

Impacts from Vegetation and Fire and Fuels Management:

Under Alternative C, vegetation treatments would have more latitude and a greater array of tools when compared to Alternative B. Recreation settings and experiences could suffer minor to moderate short-term impacts during and after the application period.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative A, with the exception that additional Watchable Wildlife areas could boost wildlife viewing opportunities. Impacts would be minor.

Impacts from Special Status Species

Impacts would be similar to those described under Alternative B, with the exception that hiking would be allowed in special status plant habitat. In addition, education programs and law enforcement contact would be used to minimize recreational activities that cause injury or mortality or degrade habitat of special status species. Impacts to recreational settings and opportunities would be negligible to minor.

Impacts from Visual Resources

Under Alternative C, some sections of Parashant and the majority of the Arizona Strip FO would be classified as VRM Class III, and impacts would be similar to those described in Alternative A. Unlike Alternative A, there is significantly fewer Class IV lands in Parashant (only 12 acres) and only a small portion in the Arizona Strip FO (72,803 acres or 92% reduction), allowing less in the way of noticeable landscape change than Alternative A, but more noticeable landscape change than Alternative B. In Vermilion, impacts are similar to those described in Alternative A.

Impacts from Cultural Resources

Impacts would be similar to those described under Alternative B.

Impacts from Livestock Grazing

Impacts would be similar to those described under Alternative B for Parashant and the Arizona Strip FO, with the exception that allotment closures would not occur in Paria Canyon and Coyote Buttes. Instead, seasonal restrictions would be placed under Alternative C, which would allow for the conflict between large numbers of wilderness users and livestock grazing. Such conflicts

would occur over a shorter period when compared to Alternative A and could have moderate impacts to recreation opportunities in Vermilion.

Impacts from Recreation

Special Recreation Management Areas: Impacts would be similar to those described under Alternative B.

Signing and Facilities: Impacts would be similar to those describe in Alternative B, with the exception that major facilities (e.g., visitor center or contact stations) could be built, but would be located in adjacent communities.

Recreation Marketing Actions: Impacts would be similar to Alternative B.

Interpretation and Environmental Education: Impacts would be similar to Alternative B.

Visitor Use Limits and Regulations: Impacts would be similar to those discussed under Alternative A, with the exception that management responses to unacceptable resource and/or social condition would be based on the Limits of Acceptable Change (LAC). This would allow the use of preemptive management techniques to limit or prevent impacts. Overall impacts to recreation opportunities could range from minor to moderate.

Camping: Impacts would be the same as described under Alternative B, with the exception that camping off designated roads would be allowed in existing sites or disturbed areas, which would provide visitors more camping opportunities. Impacts to recreational users would be minor.

Geocaching: Impacts would be similar to those described under Alternative B.

Recreation Marketing Actions: Impacts would be the same as described under Alternative B.

Permits and Fees: Impacts would be similar to those described under Alternative A.

SRP Administration: Impacts would be similar to those described under Alternative B, although slightly less efficient.

Alternative D

Impacts from Trails and Travel Management

TMA Delineation: Under Alternative D, the number of acres in the Monuments available for motorized use would be similar to Alternative A, which is significantly more compared to Alternatives B and C. This alternative would have negligible impacts on recreational OHV use and the businesses in nearby communities that cater to those users. Consequently, there would

be fewer opportunities for non-motorized recreational use compared to all other alternatives. Impacts would range from minor to moderate for non-motorized users (e.g., hikers, equestrian, and mountain bikers) and the businesses that support them.

Impacts in the Arizona Strip FO would be similar to those described under Alternative B.

OHV Area Designations: Impacts in the Monuments would be the same as described under Alternative A. For the Arizona Strip FO, impacts would fall between Alternative A and Alternative C. With only 19 percent of Arizona Strip FO lands targeted for route designation, 76 percent would remain open to motorized use on existing roads and trails. Approximately 5 percent would be closed and less than 1 percent would be open. This could have moderate impacts on motorized recreation visitors as their availability of routes would be protected at a level similar to existing conditions. The opposite would be true for non-motorized recreation visitors, and moderate impacts could result from the loss of areas being subject to route designation.

Route Designations: Impacts in the Monuments would be almost identical to Alternative C.

The same impacts described under Alternative A would affect both motorized and non-motorized users on Arizona Strip FO lands in the short-term. In the long-term, impacts would be the result of future route designations, which are described in the section on OHV Area Designations.

Trail Construction: Under Alternative D, trail construction (non-motorized) could occur to support enhanced public use. This would provide a tool to support the growing population in the region and would allow trail construction to occur when and where it is needed. This could also result in a significant increase in non-motorized trail use. The impacts from this decision would be moderate.

Wheeled Game Carriers: Impacts would be the same as described under Alternative A

Impacts from Wilderness Characteristics

Under Alternative D, approximately 140,949 acres in the Monuments would be managed with the goal of maintaining wilderness characteristics. This is significantly less than what is proposed in Alternative B and roughly half what is proposed in Alternative C. The impacts to settings and opportunities would be similar to those described in Alternatives B and C, but the degree of impact would change. Motorized recreational opportunities would be preserved and overall impacts to motorized recreation visitors would be minor. Non-motorized settings and opportunities would also expand and access to all areas would be preserved, but the total area available for non-motorized pursuits would be similar to Alternative A, which is significantly less than Alternative B and C. These impacts would be moderate.

In the Arizona Strip FO, approximately 34,628 acres would be managed with the goal of maintaining wilderness characteristics. The types of impacts to settings and opportunities would be similar to those described in Alternative B.

Impacts from Vegetation and Fire and Fuels Management

Under Alternative D, vegetation treatments throughout the Planning Area would have more latitude and a fuller array of tools when compared to Alternatives B and C. Recreation settings and experiences could suffer minor to moderate short-term impacts during and after the application period. In the long term, having a full range of tools for restoring the landscape to its natural condition would enhance recreation experiences and settings.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative C.

Impacts from Special Status Species

Impacts would be similar to those described under Alternative C.

Impacts from Visual Resources

Impacts would be similar to those described under Alternative C.

Impacts from Cultural Resources

Impacts would be similar to those described under Alternative B.

Impacts from Livestock Grazing

Impacts would be similar to those described under Alternative B for Parashant and the Arizona Strip FO. Impacts would be similar to those described under Alternative C for Vermilion, except that the seasonal restrictions in Coyote Buttes would be removed, which would allow for year-long conflict between large numbers of wilderness users and livestock grazing and exacerbate an already difficult problem. This specific conflict could have major impacts.

Impacts from Recreation

Special Recreation Management Areas: Impacts would be similar to Alternative B.

Signing and Facilities: Impacts would be similar to those describe under Alternative C.

Recreation Marketing Actions: Impacts would be similar to Alternative B.

Interpretation and Environmental Education: Impacts would be similar to Alternative B.

Visitor Limits and Regulations: Impacts would be similar to Alternative C.

Camping: Impacts would be similar to those described under Alternative C.

Geocaching: Under Alternative D, geocache sites would be relocated with help from local geocachers if, through monitoring, it were determined that important resources would be at risk of unacceptable change. The impact to recreational users would be negligible.

Recreation Marketing Actions: Impacts would be the same as described under Alternative B.

Permits and Fees: Impacts would be similar to those described under Alternative A.

SRP Administration: Impacts would be similar to those described under Alternative A.

Alternative E: Preferred

Impacts from Trails and Travel Management

TMA Delineation: Impacts would be similar to those described under Alternative D in the Monuments and similar to those described under Alternatives B in the Arizona Strip FO.

OHV Area Designations: Impacts would be the same as described under Alternative A.

Route Designations: Under Alternative E, 2,032 miles of roads would remain open to motorized travel in the Monuments, a minor increase over Alternative C, but still 151 miles less than what would be available under Alternative A. This reduction would have negligible impacts on recreational OHV use and the businesses in nearby communities that cater to those users. Conversely, opportunities for non-motorized recreational use could decrease slightly. These impacts would likely be minor to moderate for non-motorized users (e.g., hikers, equestrian, and mountain bikers) and the businesses that support them.

The same impacts described in Alternative A would affect both motorized and non-motorized users on Arizona Strip FO lands in the short-term. In the long-term, impacts would be the result of future route designations, which are described in the section on OHV Area Designations.

Trail Construction: Impacts would be the same as described under Alternative D.

Wheeled Game Carriers: Impacts would be the same as described under Alternative A

Impacts from Wilderness Characteristics

Impacts would be similar to those described under Alternative C.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be similar to those described under Alternative D.

Impacts from Fish and Wildlife

Impacts would be similar to those described under Alternative C.

Impacts from Special Status Species

Impacts would be similar to those described under Alternative C.

Impacts from Visual Resources

In Parashant, impacts would be similar to those described under Alternative C. In Vermilion, impacts would be similar to Alternative B. Impacts in the Arizona Strip FO would also be similar to those described under Alternative B, albeit slightly more noticeable landscape change would be allowed.

Impacts from Cultural Resources

Impacts would be similar to those described under Alternative B.

Impacts from Livestock Grazing

Impacts would be similar to those described in Alternative B for Parashant and the Arizona Strip FO. Impacts would be similar to those described in Alternative B for the Paria Canyon portion of Vermilion, and similar to Alternative D for Coyote Buttes.

Impacts from Recreation

Special Recreation Management Areas: Impacts would be similar to Alternative B.

Signing and Facilities: Impacts would be similar to those describe in Alternative C.

Recreation Marketing Actions: Impacts would be similar to Alternative B.

Interpretation and Environmental Education: Impacts would be similar to Alternative B.

Visitor Limits and Regulations: In general, impacts would be the same as described under Alternative C, including use of LAC. The only difference is that carrying capacities may be established as wilderness management plans and activity plans are completed. Impacts from using carrying capacities in wilderness areas would be the same as described for the entire Monument under Alternative B.

Camping: Impacts would be similar to those described under Alternative C.

Geocaching: Impacts would be similar to those described under Alternative D.

Permits and Fees: Impacts would be similar to those described under Alternative A.

SRP Administration: Impacts would be similar to those described under Alternative C.

Cumulative Impacts

The geographic area for analysis of cumulative impacts to recreation and visitor services/interpretation and environmental education is northern Arizona, southwestern Utah, and southeastern Nevada. Over time, continued population growth of the large and small communities in this area will contribute to greater visitation to the Planning Area. Additionally, the development of large blocks of Arizona State Trust lands for residential, commercial, urban, and other community expansion purposes will shift much of the recreation use that currently takes place on those lands to adjacent public lands. Such a shift will produce an increase in the creation of illegal routes and strong potential for shifting prescribed recreation settings toward more rural/urban character.

The growing need to decrease the potential for catastrophic fire in the region through mechanical treatments aimed at reducing fuel loads will gradually alter landscapes and recreation settings where treatments are conducted. Smoke from prescribed fires used for the same purpose will sporadically affect the quality of viewsheds and interfere with the public's viewing of scenery. The potential for noxious weed invasions in the region to change existing landscape form, texture, and color over large areas in a relatively short time will gradually affect the naturalness attribute of the physical setting component.

Extended drought conditions combined with construction activities (related to urban growth) and increased use of dirt roads in the region (related to the growing numbers of visitors) will contribute to more frequent and prolonged periods of fugitive dust and reduced access, which would affect the availability of recreation opportunities. Conversely, diligent application of Standards for Rangeland Health, the maintenance of Vital Sign resources on NPS lands, reclamation practices, restoration projects, and the progression toward achieving desired future conditions for vegetation management will noticeably reduce the potential for fine soil particles

to become airborne. Such practices will, if successful, improve scenic quality and enhance a variety of recreation settings.

Continued application of visual resource design principles for permitted projects, activities, and uses on public lands will do much to maintain physical recreation settings within the Planning Area. A shift toward renewed uranium exploration and extraction will shift the remoteness attribute of physical recreation settings and the encounters with others attribute of the social recreation settings via the construction and regular use of new routes in non-Monument areas. As some shifting in the region occurs from agricultural-related businesses to recreation and tourism, some landscapes and recreation settings will be enhanced by the removal of unneeded structures. However, such a shift may create other impacts to recreation settings by providing for more structured recreation, accompanied by increased visitation. Management of areas such as wilderness, proposed wilderness, areas having wilderness characteristics, and various ACECs will contribute to maintaining or enhancing landscapes and recreation setting conditions on scattered, large tracts of public land.

TRAILS AND TRAVEL MANAGEMENT

The transportation network consists of several thousand miles of roads and trails, mostly unpaved, that provide access into and across the Planning Area. Various individuals rely on this network to access livestock operations, mining properties, utility and communication facilities, range and wildlife developments, wildfire prevention/management and suppression, special use areas, recreation sites, research areas, monitoring stations, and intermingled private- and state-owned lands. Management decisions that involve changes to miles of roads open for public or administrative use, different TMA objectives, number of acres open to off-road travel, road improvement or maintenance activities, or specific travel restrictions (e.g., speed limits, seasonal restrictions; etc.) would affect access into and across the Planning Area.

Methods and Assumptions

Baseline route inventories were completed for the two Monuments and several areas within the Arizona Strip FO. The Route Evaluation Tree© method (see Appendix 2.T) was then used to determine the designation status (e.g., designated as open, limited in use, or completely closed) for existing routes under each of the alternatives except Alternative A. The potential impacts to access into and across the Planning Area as determined by the miles of routes open to public use is based on the results of the Route Evaluation Tree© process. BLM resource specialists at the Arizona Strip FO and NPS staff at Lake Mead NRA used their expertise in applying the Route Evaluation Tree© method and analyzing the impacts. Combined, these staff members possess an extensive knowledge of travel management and access issues within the Planning Area.

Specific route evaluations were not done for most of the Arizona Strip FO because route inventories are not yet complete. The Plan presents a preliminary route network of existing routes for analysis, pending completion of the inventory and application of the Route Evaluation

Tree© method following the completion of this Plan. In the St. George Basin area, route inventory has been completed, but application of the Route Evaluation Tree© has not. A reasonable and foreseeable designation status for St. George Basin was developed and used for analysis.

- Negligible:** Impacts on travel and access would not be noticeable as there would be no discernible effect on miles of routes designated as open, limited in use, or completely closed. While a few roads could be improved or upgraded, overall road conditions would essentially remain the same.
- Minor:** Impacts on travel and access would be slightly noticeable in certain areas, although there would be no substantive effect on the overall miles of routes designated as open, limited in use, or completely closed throughout the Planning Area. While numerous roads could be improved or upgraded, these would be site specific while the condition of most roads would essentially remain the same.
- Moderate:** Impacts on travel and access would be evident in many portions of Planning Area due to the overall miles of routes designated as open, limited in use, or completely closed. Changes in road conditions would be noticeable in certain portions of the Planning Area due to road improvement or upgrades.
- Major:** Impacts on travel and access would be extensive throughout the Planning Area due to the overall miles of routes designated as open, limited in use, or completely closed. Substantial numbers/miles of roads would be improved or upgraded, resulting in a noticeable change in road condition throughout the Planning Area.

Impacts to Trails and Travel Management

Impacts to Trails and Travel Management in Parashant would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Fish and Wildlife
- Special Status Species
- Cultural Resources (Arizona Strip FO only)
- Special Area Designations
- Recreation
- Lands and Realty (Arizona Strip FO only)

*Alternative A: No Action*Impacts from Trails and Travel Management

Under Alternative A in the Monuments, vehicle travel would be allowed only on designated routes, with no areas of the Monument being open to motorized and mechanized cross-country vehicle travel, with the exception of authorized administrative and emergency purposes. Out of 1,816 miles of routes identified in Parashant during the baseline route inventories, 1,700 miles would be designated as open to the public and 26 miles would be designated open to administrative use only. Out of 633 miles of routes identified in Vermilion during the baseline route inventories, 444 miles would be designated as open to the public and 13 miles would be designated open to administrative use only.

Travel through the Monuments is expected to increase due to the growing population in the communities and counties surrounding the Planning Area (see Socioeconomic section) and the increased demand for recreation opportunities on public lands (see Recreation section). In the long term, travelers could experience increases in traffic on designated routes due to increased use. Impacts would be minor in the short-term but could become moderate to major in the long term. The management actions of limiting travel to designated roads and allowing no new motorized route construction, which could otherwise address increased use, would exacerbate this impact. In addition, some designated routes could be closed if unacceptable impacts to resources/Monument objects are determined, further increasing demand for the remaining open routes. Finally, designated routes would not be upgraded or enhanced to address potential increases in traffic. This could increase the number of conflicts and traffic accidents on certain, heavily used routes.

Of 1.98 million acres of BLM lands in the Arizona Strip FO, vehicle travel would be limited to designated roads and trails on 282,019 acres and limited to existing roads and trails on 1,575,140 acres. Eight hundred and three acres would be open to motorized and mechanized vehicle use while 123,100 acres would be closed.

Travel through the Arizona Strip FO is expected to increase due to the growing population in the communities and counties surrounding the Planning Area (see Socioeconomic section) and the increased demand for recreation opportunities on public lands (see Recreation section). The greatest demand for access would occur near communities. One of the demands would be for more access to open areas for OHV use. The 803 acres of open area proposed under Alternative A would not be enough to meet such demand.

In the long term, travelers in the Arizona Strip FO could experience increases in traffic on designated routes due to increased use. Permitting public travel on both designated and existing roads and trails would alleviate traffic and conflicts. New motorized route construction (the minimum necessary to achieve Plan provisions) could reduce potential traffic and conflicts even

further. However, designated and existing routes would not be upgraded or enhanced to address potential increases in traffic. This could increase the number of conflicts and traffic accidents on certain, heavily used routes.

Impacts from Fish and Wildlife

No management actions within the fish and wildlife program proposed under Alternative A would affect travel and access.

Impacts from Special Status Species

Restrictions placed on protecting desert tortoises could affect travel within desert tortoise habitat in both Parashant and the Arizona Strip FO. Specific transportation and access restrictions would occur within the Pakoon DWMA and desert tortoise ACECs, including not allowing new paved roads; limitations on temporary upgrading existing roads; seasonal restrictions on the regular maintenance of existing roads; and speed limits (at or below 40 mph) for BLM-authorized projects traveling on unpaved, high density tortoise areas during the species active season. Outside the Pakoon DWMA and desert tortoise ACECs but within desert tortoise habitat, use of roads constructed for specific non-public purposes, such as access routes to microwave towers, would be limited to administrative use only and temporary access routes would be modified as necessary to prevent further access. These restrictions would have minor, site-specific impacts on travel and access in Parashant and the Arizona Strip FO.

Impacts from Cultural Resources

In cultural ACECs in the Arizona Strip FO, travel would be limited to designated roads and trails or limited to existing roads and trails until route designation is complete. Restrictions would also be placed on OHV travel. Portions of the Old Spanish NHT on BLM lands would be closed to unauthorized vehicles where protected archaeological and historic sites and trail route segments are negatively impacted. Overall impacts to travel and access would be site-specific and minor due to the relatively small area impacted and the limited number of roads potentially closed.

Impacts from Special Area Designation

In all three planning areas, various restrictions on travel would be implemented in wilderness areas and wild and scenic study corridors. In actuality, these two special area designations overlap. In wilderness areas, all motorized vehicles, motorized equipment, aircraft landing, and other forms of mechanical transport (including mountain bikes and wheeled game carriers) would continue to be prohibited, except for necessary administrative purposes, emergency situations, or exercise of a private existing right or other special provision. In the Paria River wild and scenic river study area and the "wild" section of the Virgin River, the construction of new roads would be prohibited. Impacts would be minor considering no existing routes would be impacted.

In DWMAs/ACECs, specific restrictions would be applied on road construction, maintenance, and travel. The majority of such restrictions would occur in desert tortoise DWMAs/ACECs. Impacts would be minor considering the limited number of existing routes impacted.

Impacts from Recreation

Under Alternative A, the BLM would continue to write sign plans addressing present and future needs, including road information and public safety. Such sign plans would be coordinated with the Arizona Strip visitor map. This would benefit visitors traveling in the Planning Area by reducing numbers of lost or stranded travelers and preventable accidents. Impacts would be minor.

Impacts from Lands and Realty

The disposal of up to 25,188 acres in the Arizona Strip FO would reduce the overall amount of BLM lands available to the public to access. Due to the relatively small amount of acres involved, none of which are high use areas, impacts would be minor and site specific. Legal vehicular access would be acquired across private and state lands in locations determined in need of such access. This would improve access to those individuals and agencies requiring such access. Impacts would be minor and site specific.

Alternative B

Impacts from Trails and Travel Management

As under Alternative A, vehicle travel would be allowed only on designated routes in the Monuments, with no areas being open to motorized and mechanized cross-country vehicle travel, with the exception of authorized administrative and emergency purposes. However, less than half the miles of routes (39%) would be open to public motorized use compared to Alternative A. This would result in a major impact to travel and access within and across the Monument. The recreating public would be particularly susceptible to experience these impacts. Impacts to ranchers, researchers, federal and state agencies (e.g., BLM, NPS, USFWS, AGFD, etc) would be less intense due to the miles routes designated open to administrative use only, the most of which would be designated under Alternative B compared to the other alternatives.

The potential for traffic, accidents, and conflicts experienced by travelers on designated routes in the Monuments would be considerably greater than that experienced under Alternative A due to the limited miles of routes open to the public in conjunction with the management action allowing no new motorized route construction. Impacts would be further intensified as, similar to Alternative A, some designated routes could be closed if unacceptable impacts to resources/Monument objects are determined and designated routes would not be upgraded or enhanced to address potential increases in traffic. Overall impacts from such travel management

actions would be moderate in the short-term, but could become major in the long term as visitation in the Monuments increase.

In the Arizona Strip FO under Alternative B, OHV-area designations for would limit motorized and mechanized vehicle travel to designated roads and trails on over six times more acres than under Alternative A, and there would be no areas where travel would be limited to existing routes. Overall impacts would be major in the long term, especially considering the expected continued increases in travel in the Arizona Strip FO, which could increase the number of conflicts and traffic accidents on certain, heavily used routes. The ability to upgrade routes to address public safety issues, however, would partially alleviate problems related to increases in traffic on some routes.

No parts of the Arizona Strip FO would be open to motorized and mechanized vehicle use under Alternative B, while 30,452 (25 percent) fewer acres would be closed to motorized and mechanized vehicle use compared to Alternative A. This would increase overall access and help meet the increasing demand for access for OHV and other uses. Off-road users would need to find areas outside the Arizona Strip FO to travel off road. The impact would only be moderately more intense than under Alternative A due to the minimal number of open acres proposed under Alternative A, which would also result in off-road enthusiasts to seek areas outside the Arizona Strip FO for off-road travel.

In the Littlefield and Ferry Swale areas, there would be 138 fewer miles open to the public for motorized use, or 28 percent the routes open compared to Alternative A, reducing access into those areas. Impacts would be moderate in the short term and increase in intensity over the long term as the population in the Littlefield and Page areas continues to grow and demand for access increases. In the St. George Basin area, there could be between 243 and 293 fewer miles of routes open to the public for motorized use compared to Alternative A, reducing access into that area. Impacts would be moderate. Impacts would be greatest on motorized recreationists, tourists, and other non-administrative users within the area while impacts to administrative users would be minimized due to between 147 and 187 miles of routes being open for administrative use only. A total of 90 miles of roads would be closed and rehabilitated in the Littlefield and Ferry Swale areas, while between 90 and 110 miles of roads could be closed in the St. George Basin area. All users would be affected. Impacts would be site-specific and minor to moderate.

The impacts of a preliminary route network within the remainder of the Arizona Strip FO would be essentially the same as proposed under Alternative A. Administrators, emergency personnel, and individuals with a valid existing right would be allowed to engage in cross-country motorized or mechanized travel. Additional route designations would occur over the first five years of the plan using the Route Evaluation Tree© process.

Impacts from Fish and Wildlife

In the Monuments under Alternative B, non-motorized access to public lands with fish and wildlife hunting and viewing opportunities would be maintained, though motorized modes would be greatly reduced. Impacts would be site-specific and range from negligible to major. In all three planning areas, access to public lands with sensitive wildlife and fisheries resources would be closed or limited. Impacts would be site-specific and minor.

Impacts from Special Status Species

Impacts from the protection of desert tortoises in Parashant and the Arizona Strip would be the same as described under Alternative A. In addition, active management programs could be undertaken to maintain or restore listed species and their habitats in all three planning areas, which could include the control of detrimental visitor access. This could affect access in site-specific locations. Impacts would be minor.

Under Alternative B, in addition to closing roads and trails that may cause desert tortoise mortality in the Arizona Strip FO, as proposed under Alternative A, the BLM could also close those roads causing or contributing to the individual mortality of any listed species or degradation of their habitat. Such management actions would increase the possibility of roads being closed; however, impacts would be minor as few roads would be expected to be closed.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations

The types of impacts due to travel restrictions in wilderness areas, rivers determined suitable for inclusion in the National Wild and Scenic Rivers System, DWMA, and ACECs would be the same as described under Alternative A. This is true even in Parashant where Pakoon ACEC/DWMA would lose its ACEC designation but keep its DWMA designation, which poses the same restrictions on travel as the ACEC. However, overall impacts due to travel restrictions in ACECs would be more widespread in the Arizona Strip FO due to the creation of additional ACECs and expansion of existing ones.

Impacts from Recreation

Impacts would be similar to that described under Alternative A. Additionally, management of new SRMAs could constrain or restrict public access in certain recreation management zones (RMZs) within the SRMAs, or enhance or encourage greater public access in other RMZs. The overall impact would be minor to moderate on a localized basis.

Impacts from Lands and Realty

In the Arizona Strip FO, under Alternative B, 1,507 fewer acres would be made available for disposal than under Alternative A, which would result in negligible difference in impacts. Legal vehicle access would be acquired across private and state lands in similar locations as described under Alternative A, resulting in similar impacts. In addition, the paved access road in Ferry Swale, previously used for access to the now closed Page Landfill, would remain in place with the locked gate on Glen Canyon NRA removed to allow for more public access to the Ferry Swale area.

Alternative C

Impacts from Trails and Travel Management

As under Alternative A, vehicle travel would be allowed only on designated routes, with no areas of the Monument being open to motorized and mechanized cross-country vehicle travel, with the exception of authorized administrative and emergency purposes. However, there would be 404 fewer miles of routes open to the public for motorized use in Parashant and 70 fewer miles of routes open to the public for motorized use in Vermilion compared to Alternative A, reducing access into the Monuments. Impacts would be moderate. Impacts would not be as extensive compared to Alternative B as Alternative C proposes nearly twice as many miles of open routes in the Monuments. Impacts to ranchers, researchers, federal and state agencies would be minimized due to 255 miles of routes in Parashant and 72 miles of routes in Vermilion designated open to administrative use only.

The potential for traffic, accidents, and conflicts experienced by travelers on designated routes would be greater than under Alternative A in the Monuments due to fewer miles of routes open to the public for motorized and mechanized vehicle use. As under Alternative A, some designated routes could be closed if unacceptable impacts to resources/Monument objects are determined. Differing from Alternative A and B, new motorized route construction (the minimum necessary to achieve Plan provisions) could occur on BLM lands. This could allow for some traffic alleviation not possible under Alternative A or B. In addition, designated routes could be upgraded or enhanced on BLM lands to address potential public safety concerns, such as those resulting from increased traffic, thus improving access. Impacts would be minor.

Under Alternative C in the Arizona Strip FO, OHV-area designations would limit motorized and mechanized vehicle use to designated roads and trails on over twice as many acres as under Alternative A, while travel would be limited to existing routes on 370,358 (24 percent) fewer acres than under Alternative A. These actions would slightly reduce the potential number of routes available for public access in the Arizona Strip FO. Closing 30,452 fewer acres to motorized and mechanized vehicle use compared to Alternative A would result in the same impacts as described under Alternative B. Impacts would be moderate. As under Alternative B,

the ability to upgrade routes to address public safety issues would partially alleviate problems related to increases in traffic on some routes. In addition, new motorized routes could be constructed, although it would be the minimum necessary to achieve Plan provisions and thus only slightly increases the possibility of reducing congestion along some routes within the Arizona Strip FO.

Nearly twice as many acres would be open to motorized and mechanized vehicle use in the Arizona Strip FO compared to Alternative A. This would increase opportunities for off-road access, although probably not sufficient to meet the increasing demand for off-road access for OHV and other uses. Impacts to off-road travelers would be minor.

Under Alternative C, 119 fewer miles of roads would be open to the public in the Littlefield and Ferry Swale areas compared to Alternative A, although 119 more miles would be open compared to Alternative B. Impacts would be greatest to recreationists, tourists, and other non-administrative users within the areas while opening 99 miles to administrative use only would minimize impacts to administrative users. Forty-eight miles of roads would be closed and rehabilitated, affecting all users. This impact would be site-specific and minor, again, less intense when compared to Alternative B. In the St. George Basin area, there could be between 63 and 153 fewer miles of routes open compared to Alternative A, reducing access into those areas. Impacts would be minor to moderate. Between 50 and 60 miles of roads (just over half the miles proposed for Alternative B) could be closed in the St. George Basin area. All users would be affected.

The impacts of a preliminary route network within the remainder of the Arizona Strip FO would be essentially the same as proposed under Alternative A. Administrators, emergency personnel, and individuals with a valid existing right would be allowed to engage in cross-country motorized or mechanized travel. Additional route designations would occur over the first five years of the Plan using the Route Evaluation Tree© process.

Impacts from Fish and Wildlife

Impacts would be the same as discussed under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations

In the Monuments, impacts would be the same as described under Alternative A. In the Arizona Strip FO, impacts would be the same as described under Alternative A, with the exception that impacts from ACECs would be more widespread due to the designation of new or expansion of additional ACECs, but not as widespread compared to Alternative B.

Impacts from Recreation

Impacts would be similar to that described under Alternative B.

Impacts from Lands and Realty

Under Alternative C, 164 fewer acres in the Arizona Strip FO would be made available for disposal than under Alternative A, which would result in negligible difference in impacts. Other impacts would be the same as described under Alternative B.

Alternative D

Impacts from Trails and Travel Management

As under Alternative A, vehicle travel in the Monuments would be allowed only on designated routes, with no areas of the Monument being open to motorize and mechanized cross-country vehicle travel, with the exception of authorized administrative and emergency purposes. However, there would be 176 fewer miles of routes open to the public for motorized use in Parashant and 24 fewer miles of routes open to the public for motorized use in Vermilion compared to Alternative A, reducing access into the Monuments. Impacts would be minor to moderate. Impacts would be less intense compared to Alternative B as Alternative D proposes over twice as many miles of open routes, and slightly less intense as under Alternative C as Alternative D. The recreating public would be most susceptible to reduced miles of open routes as impacts to ranchers, researchers, and federal and state agencies would be minimized due to routes designated open to administrative use only.

The amount of traffic, accidents, and conflicts experienced by travelers on designated routes within the Monuments would be slightly greater than under Alternative A due to fewer miles of routes open to the public under Alternative D, although impacts would be less than under Alternatives B and C. Differing from Alternative A and B but similar to Alternative C, new motorized route construction could occur on BLM lands. The basis for building such routes would be more lenient than under Alternative C as routes could be built to support enhancing public use if protection and/or enhancement of Monument objects are ensured. More routes could thus be built, allowing for improved traffic conditions and easier access to certain parts of the Monuments. As under Alternative C, designated routes could be upgraded or enhanced on

BLM lands to address potential public safety concerns, such as those resulting from increased traffic. Impacts resulting from the possibility of new motorized routes and improvement/enhancement of existing routes would improve overall access into the Monument over the long-term.

In the Arizona Strip FO under Alternative D, OHV-area designations would limit motorized and mechanized vehicle use to designated roads and trails on 87,563 more acres than under Alternative A, with travel would be limited to existing routes on 63,488 (4 percent) fewer acres than under Alternative A. This would slightly reduce the potential number of routes available for public access in the Arizona Strip FO. Impacts from closing 30,452 fewer acres to motorized and mechanized vehicle use compared to Alternative A would be the same as Alternative B. Impacts would be moderate. As under Alternative B, the ability to upgrade routes to address public safety issues would partially alleviate problems related to increases in traffic on some routes. In addition, new motorized routes could be constructed for the purposes of enhancing recreation opportunities, which increases the possibility of reducing route congestion in popular areas of the Arizona Strip FO.

Nearly nine times as many acres in the Arizona Strip FO would be open to motorized and mechanized vehicle use compared to Alternative A. This would greatly increase opportunities for off-road access, partly meeting the increasing demand for off-road access for OHV and other uses. Impacts to off-road travelers would be moderate.

Fifty-three fewer miles of roads would be open to the public in the Littlefield and Ferry Swale areas compared to Alternative A, although 185 more miles would be open compared to Alternative B and 66 more miles compared to Alternative C, reducing the intensity of impacts. Impacts to administrative users would be minimized by 50 miles of roads open for administrative use only. Thirty-one miles of roads would be closed and rehabilitated. Although such closures would affect all users, it is the least among the alternatives with the exception of Alternative A. In the St. George Basin area, between 13 and 113 fewer miles of routes could be open compared to Alternative A, reducing access into those areas. Impacts would be minor to moderate. Between 40 and 50 miles of roads (about half the miles proposed for Alternative B) could be closed in the St. George Basin area. All users would be affected.

The impacts of a preliminary route network within the remainder of the Arizona Strip FO would be the same as proposed under Alternative A. Administrators, emergency personnel, and individuals with a valid existing right would be allowed to engage in cross-country motorized or mechanized travel. Additional route designations would occur over the first 5 years of the plan using the Route Evaluation Tree© process.

Impacts from Fish and Wildlife

Impacts would be the same as discussed under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations

In the Monuments, impacts would be the same as described under Alternative A. In the Arizona Strip FO, impacts would be the same as described under Alternative A, albeit less widespread due to several ACECs losing their designations.

Impacts from Recreation

Impacts would be similar to that described under Alternative B.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative C.

Alternative E: PreferredImpacts from Trails and Travel Management

As under Alternative A, vehicle travel in the Monuments would be allowed only on designated routes, with no areas being open to motorized and mechanized cross-country vehicle travel, with the exception of authorized administrative and emergency purposes. However, there would be 303 fewer miles of routes in Parashant and 24 fewer miles of routes in Vermilion that would be open to the public compared to Alternative A, reducing access into the Monuments. Impacts would be moderate, minimal compared to Alternative B, which proposes less than half as many miles of open routes. Impacts from closed roads would fall somewhere between Alternatives C and D. As under all alternatives, the recreating public would be particularly susceptible to experience impacts while impacts to ranchers, researchers, federal and state agencies would be minimized due to routes designated open to administrative use only.

The amount of traffic experienced by travelers in the Monuments would be slightly greater than under Alternative A due to fewer miles of routes open to the public. As under Alternative A, some designated routes could be closed if unacceptable impacts to resources/Monument objects are determined. Differing from Alternative A and B but similar to Alternatives C and D, new motorized route construction could occur on BLM lands. As a result, new routes could be built and allow for improved traffic conditions and easier access to certain parts of the Monument. As

under Alternative C and D, designated routes could be upgraded or enhanced on BLM lands to address potential public safety concerns, such as those resulting from increased traffic.

In the Arizona Strip FO under Alternative E, OHV-area designations would limit motorized and mechanized vehicle use to designated roads and trails on almost seven times more acres than under Alternative A, with no travel limited to existing routes. Impacts from these decisions would thus be similar to those discussed under Alternative B. Impacts from closing 32,507 or 26 percent fewer acres to motorized and mechanized vehicle use would also be similar to those described under Alternative B. The biggest difference between Alternative E and B relates to the amount of BLM lands open to motorized and mechanized vehicle use. While there would be no open areas under Alternative B, there would be 7,186 open acres under Alternative E, which is the same as Alternative D and nearly nine times that proposed under Alternative A. As under Alternative D, this would greatly increase opportunities for off-road access, partly meeting the increasing demand for off-road access for OHV and other uses. Impacts to off-road travelers would be moderate.

As under Alternative B, the ability to upgrade routes to address public safety issues in the Arizona Strip FO would partially alleviate problems related to increases in traffic on some routes. As under Alternative D, new motorized routes could be constructed for the purposes of enhancing recreation opportunities, which increases the possibility of reducing route congestion in popular areas of the Arizona Strip FO.

Impacts from route designations in the Littlefield and Ferry Swale areas would be similar to that described under Alternative C due to similar miles of routes open, closed, and limited to administrative use. Likewise, impacts from potential route designations in the St. George Basin area would be the same as those described under Alternative D.

The impacts of a preliminary route network within the remainder of the Arizona Strip FO would be the same as proposed under Alternative A. Administrators, emergency personnel, and individuals with a valid existing right would be allowed to engage in cross-country motorized or mechanized travel on limited to existing areas only. Additional route designations would occur over the first five years of the plan using the Route Evaluation Tree© process.

Impacts from Fish and Wildlife

Impacts would be the same as discussed under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations

In the Monuments, impacts would be the same as Alternative A. In the Arizona Strip FO, impacts would be the same as described under Alternative A, albeit more widespread due to the designation of additional ACECs, but less widespread compared to Alternatives B and C.

Impacts from Recreation

Impacts would be similar to that described under Alternative B.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative C.

IMPACTS TO SPECIAL AREA DESIGNATIONS

CONGRESSIONAL DESIGNATIONS: WILDERNESS AREAS

This section presents potential impacts to designated wilderness (BLM lands only) and proposed wilderness (NPS lands only) from the five alternatives, including the No Action Alternative. There are eight wildernesses on BLM lands in the Planning Area: Grand Wash Cliffs, Paiute, Mt. Logan, and Mt. Trumbull, located in Parashant; Paria Canyon-Vermilion Cliffs, located in Vermilion; and Cottonwood Point, Kanab Creek, and Beaver Dam Mountains, located in the Arizona Strip FO. There are seven proposed wilderness areas on NPS lands in Parashant: Azure Ridge, Cockscomb, Balanced Rock, Shivwits, Andrus, Whitmore Point, and Lava. See Chapter 3 for a description of these areas.

This section analyzes management actions that influence those opportunities associated with wilderness character (i.e., solitude, naturalness, and primitive/unconfined recreation). Wilderness character is primarily influenced by the proximity of motorized travel corridors and the volume and density of recreational users. To a lesser extent, range and wildlife management projects can affect wilderness character. These impacts normally come from vegetation treatments, and the installation, maintenance, and use of range/wildlife catchments and wildlife drinkers. These impacts can be negative, such as the loss of naturalness or solitude, or positive, such as the enhancement of wildlife populations within a wilderness area.

Methods and Assumptions

The analysis of potential impacts to BLM-designated and NPS-proposed wildernesses is based on two data sources: visitor use reporting statistics, which in many cases provides detailed information on the number and types of recreational use within a wilderness area; and spatial data from the GIS. The GIS information used in this analysis includes wildlife habitat boundaries, range and wildlife developments, management units, wilderness boundaries, areas with wilderness characteristics, transportation inventories, transportation designations, ecological zones, watersheds, vegetation types, and known historical/cultural sites. In the absence of data, analyses were based on the expertise of recreation/wilderness planners.

Impacts are quantified where possible. In the absence of quantifiable data, professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. The intensities of impacts are also described, where possible, using the following guidance:

- Negligible: The impact is at the lower level of detection; there would be no measurable change.
- Minor: The impact is slight but detectable; there would be a small change.
- Moderate: The impact is readily apparent; there would be a measurable change that could result in a small but permanent change.
- Major: The impact is severe; there would be a highly noticeable, long-term, or permanent measurable change.

The following assumptions regarding the future management of designated wilderness are made:

- All laws for the management and protection of wilderness would be followed, to the extent allowed by the budget and available personnel.
- Any new surface disturbing activities proposed would be subject to NEPA analysis, and would be subject to the minimum tool requirement
- Activities proposed that would not initially meet wilderness objectives for the area would be mitigated to the extent needed to meet the objectives. Activities that could not be mitigated would not be authorized.
- Some proactive restoration of areas that do not meet desired wilderness objectives may be completed each year.

Impacts to Wilderness

Impacts to wilderness settings would result from actions proposed by the following resource management programs:

- Trails and Travel Management
- Wilderness Characteristics
- Vegetation and Fire and Fuels Management
- Fish and Wildlife
- Special Status Species
- Visual Resources
- Cultural Resources
- Special Area Designations
- Livestock Grazing
- Recreation
- Interpretation and Environmental Education
- Lands and Realty

Alternative A: No Action

Impacts from Trails and Travel Management

The current route system would be maintained and 1,700 miles of routes in Parashant, 444 miles in Vermilion, and 4,845 miles in the Arizona Strip FO would remain open to motorized and mechanized travel by the public. This includes all routes that lead directly to, or run parallel to, designated wilderness areas. Solitude in these wilderness areas would be impacted due to the proximity of open routes, and naturalness in these areas could continue to be impacted by illegal motorized intrusions. These impacts would primarily stem from OHV traffic and would remain minor, localized, and direct in the Monuments due to the remote nature of the area. In the Arizona Strip FO, impacts would become more severe in the long term due to the expanding population in Southern Utah, the corresponding increase in OHV sales, and the proximity of some areas within the Arizona Strip FO to populated areas.

Impacts from Wilderness Characteristics

No decisions regarding wilderness characteristics are proposed under Alternative A.

Impacts from Vegetation and Fire and Fuels Management

Any vegetation treatments proposed within designated or proposed wilderness could have minor to moderate impacts. Any projects would be under the minimum tool requirement, and impacts would likely be localized and short-term. Solitude experienced by recreational users could be

affected by short-term minor to moderate impacts while work was being conducted. Naturalness would be impacted at the minor to moderate level, depending on the type and scope of work. All impacts would be localized.

In Parashant, active restoration projects in wilderness areas would have a localized impact and a generally short-term effect on solitude, naturalness, and primitive/unconfined recreation, depending on the scope of the project. Long-term benefits would be realized by active restoration (within the minimum tool restriction) as having a full suite of restoration tools would allow an aggressive approach to controlling invasive species.

Impacts from Fish and Wildlife

Wildlife transplants could create a temporary loss of solitude during the release of bighorn and other species in wilderness areas. This impact could be offset by having restored native animal populations as a supplemental wilderness value.

Currently, there are 14 developed wildlife drinkers/catchments within designated wilderness in Parashant and 10 in the Arizona Strip FO. There are an additional eight drinkers/catchments in Parashant and two in the Arizona Strip FO within 1,000 feet of a wilderness or proposed wilderness boundary. These water developments would continue to serve wildlife populations throughout the two planning areas. Under Alternative A, motorized access to 16 drinkers/catchments in Parashant and eight in the Arizona Strip FO would continue. Construction and maintenance of these or other water development projects in Parashant and the Arizona Strip FO would have minor to moderate impacts on wilderness experiences in these locations by diminishing naturalness and the opportunity for primitive/unconfined recreation. Such impacts would be direct and localized, rarely extending more than 100 feet in any direction.

In Vermilion, there is one wildlife drinker within the Paria Canyon-Vermilion Cliffs Wilderness boundary and five Wildlife/Range water development projects within 1,000 feet of the wilderness boundary. These water developments mainly serve bighorn and mule deer populations on the Paria Plateau and the wilderness area. Under Alternative A, motorized access to these sites would be maintained. The disturbed area for these projects often extends into the wilderness area and is usually the result of livestock concentrations around the water development. These areas are characterized by disturbed soil, sparse vegetation, and large quantities of cow manure. The construction and maintenance of water development projects can have moderate to major impacts on designated wilderness. Naturalness and the opportunity for primitive/unconfined recreation in these locations are diminished considerably. These impacts are direct and long-term but are very localized, rarely extending more than one-half mile in any direction.

Impacts from Special Status Species

No special status species decisions proposed under Alternative A for the Monuments would affect designated or proposed wilderness areas. In general, the management of special status species' habitat in the Arizona Strip FO would involve restrictions that have a positive effect on wilderness character. Restrictions on fire use and vegetation treatment can often enhance the naturalness of wilderness. The Beaver Dam Mountains, Paiute, and Kanab Creek wilderness areas all contain habitat that falls into this category. The impacts would generally be minor and positive.

Impacts from Visual Resources

Wilderness and visual resources are generally compatible as designated and proposed wilderness is normally associated with a high visual quality. Under Alternative A, all designated wilderness areas within the Monument would be assigned to VRM Class 1, which prohibits any development that would cause negative impacts to solitude, naturalness, and primitive/unconfined recreation. Conflicts sometimes occur when wilderness is bordered by lower VRM classes. Under this alternative, approximately 40 percent of the Grand Wash Cliffs Wilderness would be bordered by VRM Class IV, while portions of the Paiute and Beaver Dam Mountains wilderness areas would be bordered by VRM Class III and IV, which would allow development within sight of the wilderness boundary. These impacts would be indirect and minor. The other wilderness areas are bordered by VRM Class 2, which does not present such a problem.

Most of NPS proposed wilderness is bordered by designated wilderness in Grand Canyon National Park and BLM Mt. Logan Wilderness. Other areas adjacent to the BLM lands are managed as VRM Class II, however, the remote nature of these lands and routes would have indirect, minor, localized impacts from VRM.

Impacts from Cultural Resources

No cultural resources decision proposed under Alternative A would affect designated or proposed wilderness areas in Parashant and the Arizona Strip FO. In Vermilion, designating the Honeymoon Trail as a public use site could increase the interest in and the use of this trail. Since the Honeymoon Trail runs along the southern boundary of the Paria Canyon-Vermilion Cliffs Wilderness Areas, an increase in the number of motorized and non-motorized visitors could have both positive and negative impacts on the wilderness area. Increased visitation increases the potential for vehicular intrusions and degradation of solitude and naturalness. Impacts are expected to be minor. A larger number of visitors could also have a positive impact, providing an opportunity for appropriate wilderness education.

Impacts from Special Area Designations (Wilderness and Wild and Scenic Rivers)

Updating wilderness management plans under Alternative A could clarify future management and have the potential to protect and enhance wilderness character. Continuing VRM Class 1 allocations to designated wilderness areas would continue to protect wilderness character (see Impacts from Visual Resources).

Wild and scenic river designation generally complements designated wilderness, adding another layer of protection to the scenic nature of the landscape and other outstandingly remarkable values. However, applying wild and scenic river status could increase the amount of recreational traffic in the Paria and Virgin river corridors located in wilderness, affecting naturalness and solitude. Current visitor use limits in the Paria would limit these impacts to negligible. Overall, classifying the Paria and Virgin rivers as suitable for wild and scenic river designation would have long-term, positive impacts on the affected wilderness areas.

Impacts from Livestock Grazing

Livestock grazing in general can have a negative impact on wilderness character. Both solitude and naturalness can be impacted by the presence of livestock in a wilderness setting. Even with a well-managed grazing program, typical recreational wilderness users have a negative attitude towards livestock grazing. In general, grazing impacts to wilderness character are direct, localized, and can range from minor to moderate.

The Pakoon Allotment incorporates about 50 percent of the Grand Wash Cliffs Wilderness. Under Alternative A, grazing would be allowed from Nov. 1 through June 15 in the area not included in the Pakoon DWMA, which is the least restrictive among the alternatives. Wilderness users are generally in the Grand Wash Cliffs Wilderness during the spring, which includes the latter part of the open grazing period. Livestock grazing during this period could have a minor impact on solitude and a slightly larger impact on naturalness. Areas frequented by livestock, like those around water developments, often have a distinctly unnatural appearance, and could affect wilderness users and their perception of naturalness.

Under Alternative A, grazing would be authorized year round in the Tuweep Allotment. Livestock grazing impacts to solitude and naturalness in the Mt. Trumbull Wilderness would be minor.

Current seasonal restrictions on the Lees Ferry allotment have direct but minor impacts on solitude and naturalness. Very few hikers are in Paria Canyon during the period when the allotment is open to grazing. It should be noted that any livestock seen in Paria Canyon generate considerable public criticism. While impacts to the resource may be minor, the perception of greater impacts is to be expected.

The Cedar Wash Allotment incorporates a majority of the Beaver Dam Mountains Wilderness. Under the current use cycle, grazing is allowed from Oct. 15 through March 15 in that area outside the desert tortoise ACEC. Ephemeral extensions are authorized through May 15. The Mesquite and Littlefield Community Allotments incorporate a large portion of the Paiute Wilderness. Under the current use cycle, grazing is allowed yearlong in that area outside the desert tortoise ACEC. Wilderness users are generally in these wilderness areas during the winter and spring, which includes the open grazing period. Livestock grazing during this period could have a minor impact on solitude and a slightly larger impact on naturalness. Areas frequented by livestock, like those around water developments, often have a distinctly unnatural appearance, and could impact wilderness users and their perception of naturalness. Overall, current management is the least restrictive of the alternatives and would thus result in the greatest or most widespread impacts.

Impacts from Recreation

Geocaching: No geocache decisions are proposed under Alternative A.

Recreation Marketing Actions: The production of maps, brochures, and other information regarding recreation opportunities would have a positive impact because such publications would allow BLM and NPS to educate potential users about specific rules, regulations, and guidelines. The dissemination of such information would also increase user safety in designated wilderness areas. Minor impacts could occur, however, because any promotional efforts could increase the number of users.

Signing and Facilities: Minor new facilities (toilets, information kiosks, and directional signs) when placed at trailheads would have a positive impact on designated and proposed wilderness. Visitor education on “Leave No Trace” ethics and area-specific rules and regulations would serve to create better-informed wilderness users.

Inventory and Monitoring: No inventory and monitoring decisions are proposed.

Visitor Use Reporting: Continuing visitor use tracking and data compilation would have a positive effect on designated and proposed wilderness.

Visitor Limits and Regulations: Adjusting visitor use limits only when the monitoring of resource and social conditions indicate a downward trend would have a short-term positive effect on designated and proposed wilderness. In the long term, those impacts would be magnified; dealing with each impact as a single, unique problem rather than analyzing them holistically would negate the opportunity to solve problems before they become unmanageable.

SRP Administration: SRP authorization would continue on a case-by-case basis. As a result, there would be less consistent data collection on commercial use, analysis capabilities on

cumulative impacts would be diminished, and outfitters would be allowed to apply for a permit at any time.

Outfitters and Guides: No outfitters and guides decisions are proposed under Alternative A.

Recreational Stock Use: Prohibiting the use of horses in Paria Canyon above Bush Head Canyon would have a positive, direct effect on solitude, naturalness, and primitive/unconfined recreation. Soil disturbance, vegetation degradation, and hiker conflicts would be eliminated in this area.

Impacts from Interpretation and Environmental Education

No interpretation and environmental education decisions are proposed under Alternative A.

Impacts from Lands and Realty

Non-federal land and easement acquisitions would have a positive impact on wilderness areas.

Alternative B

Impacts from Trails and Travel Management

Under Alternative B, 444 miles of routes in Parashant and 171 miles of routes in Vermilion would be closed to motorized and mechanized use by the public, and an additional 703 miles in Parashant and 174 miles in Vermilion would be limited to administrative use only. Of these routes, 289 miles in Parashant and 114 miles in Vermilion lead directly to, run parallel to, or are within the boundaries of designated wilderness or NPS proposed wilderness. Because of these closures, the impacts to wilderness would be considerably less when compared to the other alternatives, especially Alternative A. Solitude and naturalness would be enhanced due to route closures in proximity to wilderness. These route closures would be effective in the long-term but would likely be ineffective and difficult to implement in the short-term. The closed routes would be allowed to rehabilitate naturally, leaving them visible to the public for some time. Because so many routes would be closed under this alternative, providing adequate barriers to restrict access would be difficult. As a result, unauthorized use of many of these routes would likely continue impacts to wilderness experiences.

The current route system would be maintained until routes on Arizona Strip FO lands are officially designated. Currently, there are 4,099 miles of routes within the Arizona Strip FO that are open to motorized use. Until such designation occurs, impacts would be the same as Alternative A. It is expected that when route designation occurs, the intent of Alternative B would be carried forward.

Impacts from Wilderness Characteristics

Under this alternative, areas allocated for wilderness characteristics would have a moderate to major impact on designated or proposed wilderness areas. Many of the BLM designated and NPS proposed wilderness areas share significant common borders with areas allocated for wilderness characteristics under Alternative B. Lands having wilderness characteristics would act as “buffers” between these wilderness areas and the remainder of the Monument where solitude, naturalness, and primitive/unconfined recreation would be afforded additional protection. These impacts would be long-term, direct, and be greater in this alternative compared to all other alternatives due to proposing the most acres allocated for wilderness characteristics.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A, with the exception that long-term benefits using natural restoration processes in Parashant would be greatly reduced as the ability to control invasive species would be mostly ineffective.

Impacts from Fish and Wildlife

Impacts from wildlife transplants and wildlife drinkers/developments would be the same as described under Alternative A.

Vegetation treatment projects for wildlife could result in a temporary loss of solitude due to an increase in the dust, noise, and general activity associated with vegetation treatments. These impacts would be direct, localized, and short-term.

Impacts from Special Status Species

Minimizing surface disturbance in special status species habitat during fire suppression activities could have a positive impact on designated wilderness and naturalness could be enhanced. Reintroduction of special status species could result in minor, direct, and localized impacts to solitude, depending upon the species and its use of vegetation and other habitat features.

Impacts from Visual Resources

Under Alternative B, all wilderness areas within Parashant would be assigned to VRM Class 1, while the remainder of the Monument would be assigned to VRM Class 2. This would protect wilderness character by eliminating the conflict of Grand Wash Cliffs Wilderness being bordered by VRM Class 4 that was discussed under Alternative A. In the Arizona Strip FO, only a small portion adjacent to the Paiute Wilderness would be assigned to VRM Class III, making this alternative the most protective of wilderness character.

Impacts from Cultural Resources

Cultural field inventories proposed under Alternative B could have a temporary short-term impact on solitude and primitive/unconfined recreation opportunities. There could be a longer-term effect on naturalness depending on the extent of the inventories.

Impacts from Honeymoon Trail designation are the same as Alternative A. The same can be said for the Notch cultural site, which is located inside the Paria Canyon-Vermilion Cliffs Wilderness boundary, except that the impacts are expected to be direct, localized, and moderate in scale. A larger number of visitors mean a greater number of potential wilderness intrusions and a greater potential for degradation in solitude and naturalness. A larger number of visitors could also have a positive impact. More visitors mean greater potential for appropriate wilderness and cultural education.

Designating the Old Spanish Trail could have minor impacts to the Beaver Dam Mountain and/or Paiute wilderness areas. The trail generally follows the Interstate 15 corridor between the two wilderness areas. Minor impacts to naturalness could occur if the trail is marked and it is found that it crosses either wilderness boundary.

Impacts from Special Area Designations (Wilderness and Wild and Scenic Rivers)

Impacts would be the same as described under Alternative A, with the exception that expanding the fee demonstration area to include the "Teepees" (in the Paria Canyon-Vermilion Cliffs Wilderness) would further protect solitude and naturalness by placing restrictions upon the number of people moving through the fee demonstration area.

Impacts from Livestock Grazing

Overall impacts from livestock grazing would be the same as described under Alternative A, although impacts would be reduced or eliminated in certain allotments due to closures or seasonal restrictions. Impacts from livestock grazing in the Mt. Trumbull Wilderness would be eliminated under Alternative B due to closing the Tuweep Allotment. Grazing in the Pakoon Allotment would be allowed from October 15 through March 15 outside the Pakoon DWMA, which is the most restrictive among the alternatives. Not only does this limit impacts by reducing the overall grazing period by three and a half months, it also excludes grazing during the main user season, which generally begins in the spring. As a result, livestock grazing during the time period proposed under Alternative B would only have a negligible impact on solitude and may have a minor impact on naturalness that extends into the spring. Wilderness users' perception of naturalness would continue to be impacted by areas frequented by livestock, such as around water development, even after the livestock have been removed from the area.

In Vermilion, closing the river pasture of the Lees Ferry Allotment would have a positive, long-term impact on solitude and naturalness in the Paria Canyon-Vermilion Cliffs Wilderness, as well as preserve the public's perception of wilderness character.

Under the proposed use cycle in the Cedar Wash Allotment in the Arizona Strip FO, grazing would be allowed from Oct. 15 through March 15 in that area outside the desert tortoise ACEC. Ephemeral extensions would not be authorized. Wilderness users are generally in the Beaver Dam Mountains Wilderness during the winter and spring, which includes the open grazing period. Livestock grazing during this period could have a minor impact on solitude and a slightly larger impact on naturalness. Areas frequented by livestock, like those around water developments, often have a distinctly unnatural appearance, and could impact wilderness users and their perception of naturalness. This is the most restrictive alternative and would cause the least impact on wilderness character.

Under Alternative B's proposed use cycle for the Mesquite and Littlefield Community allotments, grazing would be allowed from Oct. 15 through May 15 in that area outside the desert tortoise ACEC. Wilderness users are generally in the Beaver Dam Mountains Wilderness during the winter and spring, which includes the open grazing period. Livestock grazing during this period could have a minor impact on solitude and a slightly larger impact on naturalness. Areas frequented by livestock, like those around water developments, often have a distinctly unnatural appearance, and could impact wilderness users and their perception of naturalness. This is the most restrictive alternative and would cause the least impact on wilderness character.

Impacts from Recreation

Impacts from recreation marketing actions and signing and facilities would be the same as described under Alternative A.

Geocaching: Immediate removal of geocache sites if impacts to Monument objects or designated wilderness were apparent would have a generally positive impact. This action could also alienate a very active and normally compliant geocaching community.

Inventory and Monitoring: The information developed thorough inventory and monitoring would have a positive impact on designated or proposed wilderness. It could be used to assess management strategies, later decisions, change implementation, or maintain current management direction.

Visitor Use Reporting: Any visitor use tracking and data compilation would have a positive effect on designated or proposed wilderness.

Visitor Use, Carrying Capacity, and LAC: Establishing mandatory carrying capacity limits in intensive use areas would reduce or maintain the number of users, having a positive effect on designated or proposed wilderness. These impacts would be indirect.

SRP Administration: Putting permit administration on a calendar year schedule with a one-month application window would have a positive impact on designated or proposed wilderness. It would enable more consistent data collection on commercial use, provide increased analysis capabilities on cumulative impacts, and ensure that only those outfitters who are organized and efficient about their operations would apply for permits.

Outfitters and Guides: Providing outfitters and guides with annual training on wilderness ethics would have a positive effect on designated or proposed wilderness.

Recreation Stock Use: Prohibiting the use of horses in Paria Canyon would have a positive effect on solitude, naturalness, and primitive/unconfined recreation. Soil disturbance, vegetation degradation, and hiker conflicts would be eliminated.

Impacts from Interpretation and Environmental Education

Supporting education and outreach programs like “Tread Lightly” and “Leave No Trace” would have a positive impact on designated and proposed wilderness.

Impacts from Lands and Realty

Acquisition of surface ownership lands and sub-surface mineral estate would have positive long-term impacts on wilderness areas and adjacent lands.

Alternative C

Impacts from Trails and Travel Management

Under Alternative C, 222 miles of routes in Parashant and 104 in Vermilion would be closed to motorized and mechanized vehicle use by the public and an additional 255 miles in Parashant and 72 miles in Vermilion would be limited to administrative use. Of these routes, 286 miles in Parashant and 42 miles in Vermilion lead directly to, run parallel to, or are within designated wilderness or proposed wilderness. Solitude and naturalness would be enhanced due to the closures in proximity to wilderness compared to Alternative A, although to a considerably lesser degree compared to Alternative B. However, in comparison to Alternative B, route closures under Alternative C would be more effective in the short because routes would be rehabilitated through the use of both natural and mechanical methods.

The current route system would be maintained until routes on Arizona Strip FO lands are officially designated. Currently, there are 4,726 miles of routes within the Arizona Strip FO that are open to motorized use. Until such designation occurs, impacts would be the same as Alternative A. It is expected that when route designation occurs, the intent of Alternative C would be carried forward.

Impacts from Wilderness Characteristics

Although the overall acreage of areas proposed for allocation of wilderness characteristics is approximately 40 percent less than under Alternative B, the areas that share a common border with existing wilderness areas would be almost identical. With the exception of two open routes directly east of the Grand Wash Cliffs Wilderness, one open route at the north end of the Mt. Logan Wilderness, and three open routes leading to NPS proposed wilderness, the impacts would be the same as described under Alternative B.

In Vermilion under Alternative C, areas allocated for wilderness characteristics could have a moderate to major impact on the Paria Canyon-Vermilion Cliffs Wilderness Area. These impacts would be long-term, have a direct effect, and be only slightly less significant than Alternative B. On the Paria Plateau, areas with wilderness characteristics share a significant common border with the Paria Canyon-Vermilion Cliffs Wilderness Area. This alternative would effectively close 52 miles of the wilderness area border on the plateau, increasing the amount of roadless area. In the Ferry Swale area, six miles of coincident border would be closed. Such closures would protect and enhance both solitude and naturalness, and expand the opportunities for primitive, unconfined recreation. Such closures would also restrict access to large portions of the Paria Plateau and Ferry Swale, but would preserve motorized access to those scenic areas where motorized access to the edge of the plateau and the existing wilderness boundary is becoming increasingly popular.

Impacts would be the same as described under Alternative B for the Arizona Strip FO. While the overall acreage of areas allocated for wilderness characteristics increases/decreases by alternative, the borders shared with the Kanab creek and Paiute wilderness areas remain unchanged.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A.

Impacts from Fish and Wildlife

Impacts from wildlife transplants and wildlife drinkers/developments would be the same as described under Alternative A. Impacts from vegetation treatment projects would be the same as under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts from Visual Resources

Impacts in Parashant would be similar to that described under Alternative A, with the exception that the VRM Class IV areas around the Grand Wash Cliffs Wilderness would be classified as VRM Class III. This would reduce the impacts discussed under Alternative A.

Impacts in Vermilion would be the same as described under Alternative A, while impacts in the Arizona Strip FO would be similar to that described under Alternative B, with a slight increase in VRM Class III areas adjacent to the Paiute Wilderness.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative B.

Impacts from Special Area Designations (Wilderness and Wild and Scenic Rivers)

Impacts would be the same as described under Alternatives B.

Impacts from Livestock Grazing

Overall impacts from livestock grazing would be the same as under Alternative A. Impacts from grazing in the Pakoon Allotment in Parashant would be similar to that described under Alternative B, with the exception that the season of use would extend one month longer, to April 15, which includes the beginning of the visitor season. Ephemeral extensions could extend use into May 15, further extending grazing into the visitor season, and thus increasing impacts on solitude compared to Alternative B. Impacts would be minor and remain less intense when compared to Alternative A.

The creation of a forage reserve on the Tuweep and Parashant allotments in Parashant would have a negligible impact on solitude and naturalness if it were put to use. The impacts would be greater than in Alternative B, but less than all other alternatives, including Alternative A.

The creation of a forage reserve on the Lees Ferry Allotment in Vermilion would have a negligible impact on solitude and naturalness if it were put to use. Very few hikers are in Paria Canyon during the period when the allotment would be open to grazing. The impacts would be minor and positive.

In the Arizona Strip FO, impacts would be the same as described under Alternative A in the Cedar Wash Allotment, while impacts would be the same as described under Alternative B for grazing in the Mesquite and Littlefield Community allotments

Impacts from Recreation

Impacts from decisions relating to geocaching, inventory and monitoring, visitor use reporting and outfitters and guides would be the same as described under Alternative B. Impacts from decisions relating to recreation marketing actions and signing and facilities would be the same as described under Alternative A.

Visitor Use, Carrying Capacity, and LAC: Using an LAC framework in intensive use areas would have a positive impact on designated wilderness. The establishment of acceptable resource, social, and managerial settings would provide an optimal balance between the demand for wilderness use and protection of wilderness values. These impacts would be indirect and long-term.

SRP Administration: Placing permit administration on a calendar year schedule with a three-month application window could have a positive impact on designated or proposed wilderness. It would enable more consistent data collection on commercial use, provide increased analysis capabilities on cumulative impacts, and ensure that only those outfitters dedicated to customer service and conservation of wilderness values would apply for permits.

Recreation Stock Use: Impacts would be the same as described under Alternative A.

Impacts from Interpretation and Environmental Education

Impacts would be the same as described under Alternative B.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative B.

Alternative D

Impacts from Trails and Travel Management

Under Alternative D, 158 miles of routes in Parashant and 87 miles in Vermilion would be closed to motorized and mechanized use by the public. An additional 92 miles of routes in Parashant and 43 miles in Vermilion would be limited to administrative use within the Monuments. Of these routes, 222 miles in Parashant and 16 in Vermilion lead directly to, run parallel to, or are within designated wilderness or NPS proposed wilderness. Solitude and naturalness would be slightly enhanced due to the closures in proximity to wilderness compared to Alternative A, although to a considerably lesser degree than under Alternative B, and slightly less than under Alternative C. As under Alternative C, these route closures would be effective in

the both the short- and long-term because routes would be rehabilitated using both natural and mechanical methods.

In the Arizona Strip FO, the current route system would be maintained until routes on Arizona Strip FO lands are officially designated. Currently, there are 4,792 miles of routes within the Arizona Strip FO that are open to motorized use. Until such designation occurs, impacts would be the same as described under Alternative A. It is expected that when route designation occurs, the intent of Alternative D would be carried forward.

Impacts from Wilderness Characteristics

In Parashant, the overall acreage of areas allocated for wilderness characteristics is approximately 66 percent less than under Alternative B and 38 percent less than under Alternative C. The areas that share a common border with existing wilderness areas would be reduced, but would still provide considerable protection by enhancing solitude, naturalness, and opportunities for primitive, unconfined recreation adjacent to designated and proposed wilderness.

As under Alternative A, no areas in Vermilion are allocated for wilderness characteristics. In the Arizona Strip FO, impacts would be the same as described under Alternative B. While the overall acreage of areas allocated for wilderness characteristics increases/decreases by alternative, the borders shared with the Kanab creek and Paiute wilderness areas remain unchanged.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A.

Impacts from Fish and Wildlife

Impacts from wildlife transplants and wildlife drinkers/developments would be the same as described under Alternative A. Impacts from vegetation treatment projects would be the same as described under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts from Visual Resources

Impacts would be the same as described under Alternative A for Vermilion, and the same as described under Alternative C for Parashant and the Arizona Strip FO.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative B.

Impacts from Special Area Designations (Wilderness and Wild and Scenic Rivers)

Impacts would be the same as described under Alternative B.

Impacts from Livestock Grazing

Overall impacts from livestock grazing would be the same as under Alternative A. Impacts relating to the Tuweep and Pakoon allotments in Parashant would be similar to that described under Alternative C, except that the season of use in the Pakoon Allotment would increase by one month, to May 15, which is well into the visitor use season. Ephemeral extensions could further extend the growing season into June 1, resulting in impacts similar to those described under Alternative A when such extensions are applied. Impacts would be minor.

In Vermilion the creation of a forage reserve on the Lees Ferry allotment could have a minor impact on solitude and naturalness if it were put to use. A significant number of hikers are in Paria Canyon during the period when the allotment would be open to grazing and the public perception of wilderness character would be affected by the presence of livestock. The impacts under this alternative would be greater than all other alternatives.

In the Arizona Strip FO, the season of use for proposed for grazing under Alternative D in the Cedar Wash and Mesquite and Littlefield Community allotments would be the longest period of use among the alternatives. As a result, impact on wilderness character in the wilderness areas associated with those allotments would be the greatest under Alternative D compared to the other allotments.

Impacts from Recreation

Impacts from recreation marketing actions, signing and facilities, and SRP administration would be the same as described under Alternative A. Impacts from inventory and monitoring and visitor use reporting would be the same as described under Alternative B.

Geocaching: Working with local geocachers to relocate geocache sites if impacts to Monument objects or designated and proposed wilderness were apparent would have a positive impact. This action could also benefit the BLM and NPS by developing a solid working relationship with an active geocaching community.

Visitor Use, Carrying Capacity, and LAC: Mitigation of resource and social impacts on a case-by-case basis would have limited negative impacts to designated wilderness in the short term. In the long term, those impacts would be magnified; dealing with each impact as a single,

unique problem rather than analyzing them holistically would negate the opportunity to solve problems before they become unmanageable.

Outfitters and Guides: Providing Outfitters and Guides with ethics publications and materials may have a positive effect on designated wilderness.

Recreational Stock Use: Prohibiting the use of horses in Paria Canyon above Bush Head Canyon and below Big Spring could have a positive effect on solitude, naturalness, and primitive/unconfined recreation in the area of the canyon that remained undisturbed. Soil disturbance, vegetation degradation, and hiker conflicts would be eliminated in this area. In those areas of the canyon where horses and pack stock were allowed, Soil disturbance, vegetation degradation, and hiker conflicts would be a constant concern.

Impacts from Interpretation and Environmental Education

Impacts would be the same as described under Alternative B.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative B.

Alternative E: Preferred

Impacts from Trails and Travel Management

Under Alternative E, 191 miles of routes in Parashant and 102 miles in Vermilion would be closed to motorized and mechanized travel by the public. An additional 185 miles in Parashant and 66 miles in Vermilion would be limited to administrative use within the Monument. Of these routes, 279 miles in Parashant and 35 miles in Vermilion lead directly to, run parallel to, or are within designated or proposed wilderness. Solitude and naturalness would be enhanced due to the closures in proximity to wilderness, resulting in impacts almost identical to Alternative C due to similar miles of closures. As under Alternatives C and D, these route closures would be effective in the both the short and long-term because routes would be rehabilitated using both natural and mechanical methods.

The current route system would be maintained until routes on Arizona Strip FO lands are officially designated. Currently, there are 4,731 miles of routes within the Arizona Strip FO that are open to motorized use. Until such designation occurs, impacts would be the same as Alternative A. It is expected that when route designation occurs, the intent of Alternative E would be carried forward.

Impacts from Wilderness Characteristics

In Parashant, impacts would be the same as described under Alternative C due to similar number of acres allocated for wilderness characteristics.

Under this alternative in Vermilion, areas allocated for wilderness characteristics would have a minor positive impact on the Paria Canyon-Vermilion Cliffs Wilderness. These impacts would be long-term, have a direct effect, and be significantly less protective than under Alternatives B or C. On the Paria Plateau, areas with wilderness characteristics share a significant common border with the Canyon-Vermilion Cliffs Wilderness. This alternative would effectively close nine miles of the Canyon-Vermilion Cliffs Wilderness border on the plateau, resulting in a small increase to the roadless area. In the Ferry Swale area, one mile of coincident border would be closed. Such closures would protect and enhance both solitude and naturalness, and expand the opportunities for primitive, unconfined recreation. Such closures would not restrict access to the Paria Plateau, and to only a small area of Ferry Swale.

In the Arizona Strip FO, impacts would be the same as described under Alternative B. While the overall acreage of areas allocated for wilderness characteristics increases/decreases by alternative, the borders shared with the Kanab Creek and Paiute wilderness areas remain unchanged.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A

Impacts from Fish and Wildlife

Impacts from wildlife transplants and wildlife drinkers/developments would be the same as described under Alternative A. Impacts from vegetation treatment projects would be the same as described under Alternative B.

Impacts from Special Status Species

Impacts would be the same as described under Alternative B.

Impacts from Visual Resources

Impacts would be the same as described under Alternative C for Parashant. Impacts would be the same as described under Alternative A for Vermilion. Impacts would be the same as described under Alternative B for the Arizona Strip FO.

Impacts from Cultural Resources

Impacts would be the same as described under Alternative B.

Impacts from Special Area Designations (Wilderness and Wild and Scenic Rivers)

Impacts would be the same as described under Alternative B.

Impacts from Livestock Grazing

Overall impacts from livestock grazing would be the same as under Alternative A. Impacts relating to the season of use within Pakoon Springs and Tuweep Allotments in Parashant would be the same as described under Alternative C, with the exception that ephemeral extensions authorized in the Pakoon Springs Allotment would be the same as under Alternative D.

Impacts from grazing within the Lees Ferry allotment in Vermilion would be the same as described under Alternative B, as would grazing in the Mesquite and Littlefield Community allotments in the Arizona Strip FO. Impacts from grazing in the Cedar Wash allotment would be the same as described under Alternative D.

Impacts from Recreation

Impacts from recreation marketing actions, signing and facilities, and recreation stock use (Vermilion only) would be the same as described under Alternative A. Impacts from inventory and monitoring, visitor use reporting, and outfitters and guides would be the same as described under Alternative B. Impacts from using an LAC framework and decisions relating to SRP administration would be the same as described under Alternative C. Impacts from decisions relating to geocaching would be the same as described under Alternative D.

Impacts from Interpretation and Environmental Education

Impacts would be the same as described under Alternative B.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative B.

Cumulative Impacts

The geographic area of analysis for cumulative impacts to designated wilderness is the Planning Area. Wilderness is primarily affected by the number and proximity of motorized travel corridors; the volume and type of traffic on those corridors; and the quantity and type of

recreational users. To a lesser extent, range and wildlife management projects can impact wilderness. These impacts normally come from vegetation treatments and the installation, maintenance, and use of range/wildlife catchments and wildlife drinkers. Population growth and the resulting increase in recreational use are expected to have a significant impact to all wilderness areas on the Arizona Strip over the life of the plan. An increase in motorized and non-motorized use during the life of this plan could have major impacts on the three components of wilderness character: solitude, naturalness, and opportunities for primitive/unconfined recreation.

CONGRESSIONAL DESIGNATIONS: WILD AND SCENIC RIVERS

Specific portions of the Paria River in Vermilion and the Virgin River in the Arizona Strip FO were identified in the Arizona Strip District RMP (BLM 1991) as eligible for further study in the wild and scenic river evaluation process. No rivers were identified as eligible in Parashant. The Arizona Statewide Wild and Scenic Rivers Legislative EIS (BLM 1994) later found these river segments suitable for inclusion in the National Wild and Scenic Rivers System. This section identifies potential impacts to those suitable river segments resulting from the proposed management actions.

Methods and Assumptions

The Arizona Statewide Wild and Scenic Rivers Legislative EIS (BLM 1994) identified certain interim management prescriptions that include management objectives, management actions, and appropriate allocations of land and resource uses to maintain or enhance the outstandingly remarkable values and tentative classification of the suitable segments of the Paria and Virgin Rivers that flow through the Planning Area. Pursuant to the Wild and Scenic Rivers Act of 1968, no uses would be authorized reducing or destroying their potential eligibility classification or suitability for consideration for inclusion in the National Wild and Scenic Rivers System until Congress makes final decisions. Impacts on wild and scenic river values would come from management actions that either diminish or enhance the outstandingly remarkable or free flowing values that make the river eligible.

Negligible: A change enhancing or diminishing outstandingly remarkable or free flowing values could occur, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: A change enhancing or diminishing outstandingly remarkable or free flowing values would occur, but the change would be small and, if measurable, would be localized and not affect eligibility or suitability determinations.

Moderate: A change enhancing or diminishing outstandingly remarkable or free flowing values would occur. The change would be measurable, but localized, with

adverse impacts readily mitigated so not to threaten eligibility or suitability determinations.

Major: A change enhancing or diminishing outstandingly remarkable or free flowing values would occur. The change would be measurable and widespread, with adverse impacts potentially threatening eligibility or suitability determinations.

Impacts to Wild and Scenic Rivers

Impacts to the suitable segments of the Paria and Virgin rivers would result from actions proposed under the following resource management programs:

- Cultural Resources (Vermilion and only)
- Special Status Species (Arizona Strip FO only)
- Recreation (Arizona Strip FO only)
- Special Management Areas (Wild and Scenic Rivers: Vermilion and Arizona Strip FO)
- Livestock Grazing (Vermilion only)
- Lands and Realty (Arizona Strip FO only)

Alternative A: No Action

Special Status Species

The Virgin River ACEC would be maintained at its current acreage under Alternative A. The entire wild and scenic river study area (a roughly ½ mile-wide corridor along the suitable river segment, extending ¼ mile from each side of the normal high water line) is located within the Virgin River ACEC. This ACEC designation partially functions to protect fish and wildlife habitat, aquatic and riparian resources, and other outstandingly remarkable values that contribute to the river's eligibility/suitability.

Cultural Resources

Cultural resources are considered outstandingly remarkable values that make the Paria River eligible for wild and scenic river consideration. Under Alternative A, the Paria River would be a priority geographic and historic area for new field inventory, which would lead to identification of significant cultural sites. Following identification, the policy to conserve, protect, stabilize or restore, and maintain such resources in good or better condition would aid in the preservation of such resources and maintain the Paria River's eligibility and suitability classification.

Special Management Areas (Wild and Scenic Rivers)

All of the management actions proposed are based on interim management decisions outlined the Arizona Statewide Wild and Scenic Rivers Legislative EIS (BLM 1994). These decisions would

maintain or enhance the outstandingly remarkable values and tentative classification of the suitable segments of the Paria and Virgin rivers.

Recreation

Recreation experiences, including the feeling of solitude and remoteness within a pristine wilderness environment were identified as an outstandingly remarkable value of the Paria River. Continuing current group size restrictions, visitor use limits, special area permits, and use fees in Paria Canyon would maintain such recreational experiences within the proposed wild and scenic river corridor.

Livestock Grazing

Visitors in the Paria River corridor have complained about the presence of livestock, livestock droppings, flies, odors, and overgrazed vegetation in the lower portion of the corridor (BLM 1994). Grazing would continue in the Lees Ferry Allotment under the current rest-rotation cycle under Alternative A. As a result, the visitor complaints would continue. Impacts to the outstandingly remarkable recreational values would be negligible since such values were identified under the current grazing system.

Lands and Realty

The Virgin River Gorge 23,186 acre recreation (scenic) withdrawal would continue under Alternative A, which would help ensure maintenance of the scenic quality of the Virgin River corridor, an outstandingly remarkable value.

Acquisition of non-federal lands in Virgin River riparian areas would be negotiated as opportunities arise. Acquiring such lands would further ensure protection of outstandingly remarkable and free flowing values of the currently suitable segments that flow through BLM lands.

Alternative B

Special Status Species

The Virgin River ACEC would be modified to include only the 100-year floodplain (approximately 2,063 acres). Boundary adjustments would exclude areas outside of the 100-year floodplain previously included in the ACEC. Some of these areas are still within the wild and scenic river study corridor. Areas outside the 100-year floodplain and not within the Paiute and Beaver Dam Mountains Wildernesses could experience some adverse impact due to mining activities (the wildernesses have been withdrawn from mining). Mining outside the wildernesses but within the Virgin River ACEC would require an approved plan of operation for locatable mineral activity. Such a plan would contain mitigation to minimize impacts to fish and wildlife,

aquatic and riparian, geologic, and scenic values. The smaller ACEC would continue to protect fish and wildlife and aquatic and riparian values of the Virgin River. However, geologic and scenic values outside the smaller ACEC and the Paiute and Beaver Dam Mountains Wildernesses but within the wild and scenic river study corridor could be impacted by mining activities. Impacts would be minor.

Cultural Resources

Impacts would be the same as described under Alternative A.

Special Area Designations (Wild and Scenic Rivers)

Impacts would be the same as described under Alternative A.

Recreation

Impacts would be the same as described under Alternative A.

Livestock Grazing

The River Pasture of the Lees Ferry Allotment would be closed under Alternative B. This would improve visitor experiences along the Paria River, especially within lower portions. As a result, the outstandingly remarkable recreational values would be enhanced. Impacts would be minor.

Lands and Realty

Revoking part of the Virgin Rive Gorge Recreation Lands Withdrawal that overlaps statutory wilderness would not affect protection of outstandingly remarkable values. Only the portions of the river tentatively classified as wild would be involved (i.e., those portions that flow through wilderness areas), which are sufficiently protected by wilderness management stipulations, including a VRM Class 1 allocation. Impacts from land acquisitions would be the same as described under Alternative A.

Alternative C

Special Status Species

Impacts would be the same as described under Alternative B.

Cultural Resources

Impacts would be the same as described under Alternative A.

Special Management Areas (Wild and Scenic Rivers)

Impacts would be the same as described under Alternative A.

Recreation

Impacts would be the same as described under Alternative A.

Livestock Grazing

Grazing would continue in the Lees Ferry Allotment under a more restrictive rest-rotation cycle compared to Alternative A, which includes a slightly shorter season of use. As a result, the visitor complaints would continue, with the potential to decrease slightly. Impacts to the outstandingly remarkable recreational values would be negligible.

Lands and Realty

Impacts would be the same as described under Alternative B.

Alternative DSpecial Status Species

Impacts would be the same as described under Alternative B.

Cultural Resources

Impacts would be the same as described under Alternative A.

Wild and Scenic Rivers

Impacts would be the same as described under Alternative A.

Recreation

Impacts would be the same as described under Alternative A.

Livestock Grazing

Grazing would continue in the Lees Ferry Allotment under a more lenient rest-rotation cycle compared to Alternative A, which includes a slightly longer season of use. As a result, the visitor complaints would continue, with the potential to increase slightly. Impacts to the outstandingly remarkable recreational values would be negligible,

Lands and Realty

Impacts would be the same as described under Alternative B.

*Alternative E: Preferred*Special Status Species

Impacts would be the same as described under Alternative B.

Cultural Resources

Impacts would be the same as described under Alternative A.

Special Management Areas (Wild and Scenic Rivers)

Impacts would be the same as described under Alternative A.

Recreation

Impacts would be the same as described under Alternative A.

Livestock Grazing

Impacts would be the same as described under Alternative B.

Lands and Realty

Impacts would be the same as described under Alternative B.

CONGRESSIONAL DESIGNATIONS: NATIONAL HISTORIC TRAILS

In 2002, Congress designated the Old Spanish Trail as a NHT. The trail qualifies for listing on the NRHP. Impacts to the Old Spanish NHT would result from destruction or alteration of the trail corridor or associated resources and from alterations of the trail's historic setting. Impacts could include unauthorized collection and excavation, vandalism, erosion, OHV use off-road, and mechanized surface disturbance.

Methods and Assumptions

The trail primarily crosses the Arizona Strip FO, particularly in the northwestern corner of the Planning Area near Littlefield, Arizona. A portion of the southern branch may cross through Vermilion. The trail does not cross through Parashant.

In evaluating the impacts associated with meeting the goals of the National Trails System and the potential NRHP listing, best professional judgment was used. Impacts would be considered major if they resulted in an intact trail segment or associated resource losing the integrity it now possesses for inclusion in the NRHP.

Impacts to the NHT in the Planning Area would result from actions proposed under the following resource management programs:

- Visual
- Cultural Resources
- Recreation
- Special Area Designations (Arizona Strip FO only)
- Lands and Realty (Arizona Strip FO only)

Alternative A: No Action

Impacts from Visual

Under the No Action Alternative, the major portions of the Old Spanish NHT which cross the northwestern corner of the Arizona Strip FO would be assigned to VRM Class III (the trail segment crossing the extreme corner of the state) and VRM Class II (the branch of the trail which leads to Beaver Dam and follows the Virgin River). Some protection of the visual setting of the trail would be preserved in the Class II area while some visual intrusions may be allowed in the Class III area, which could alter the historic setting of the trail. Impacts could be minor, with some site-specific moderate impacts.

In Vermilion, all of the NHT trail segments would be assigned to VRM Class II, providing protection from visual alteration of the historic setting.

Impacts from Cultural Resources

There would be no impacts from the cultural resources program under Alternative A.

Impacts from Recreation

Impacts to the Old Spanish NHT would continue to occur from OHV trails crossing intact trail segments, associated resources, and the historic setting in which they occur. These off-road trails could lead to subsequent erosion that could alter the resource or its setting. Impacts would range from minor to moderate.

Impacts from Special Area Designations (Arizona Strip FO only)

Portions of the Old Spanish NHT cross through the Beaver Dam Slope and Virgin River ACECs, which would benefit from the protection offered to special status species and cultural resources. Impacts would be minor.

Impacts from Lands and Realty (Arizona Strip FO only)

The Navajo-McCullough ROW parallels a major segment of the Old Spanish NHT in the northwestern corner of the Arizona Strip FO and crosses it in several places. Use of the existing ROW and subsequent powerline additions would continue to impact the NHT through destruction of the trail segments and associated resources, as well as compromising the historic setting. Impacts would be moderate.

Alternative B

Impacts from Visual

Under Alternative B, most of the Old Spanish NHT within the Planning Area would be protected under VRM Class II, except for the main trail segment in the northwest corner of the Arizona Strip FO which follows the Navajo-McCullough ROW, which would be assigned to VRM IV. Impacts along these sections would range from moderate to major. Impacts along the remaining sections of the NHT in the Planning Area would be minor.

Impacts from Cultural

Under Alternative B, the Old Spanish NHT would be designated a Public Use Site. This could result in increased visitation which could impact the trail, associated resources, and historic setting from additional vehicle traffic, increased erosion and vandalism, and loss of site integrity. Overall impacts would be minor, although some site-specific impacts could be moderate. Interpretation and public education about the NHT would help the public appreciate and protect this resource.

Impacts from Recreation

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Impacts from Lands and Realty (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

*Alternative C*Impacts from Visual

Under Alternative C, more of Old Spanish NHT in the northwestern corner of the Arizona Strip FO be assigned to Class III and IV, which would all for more modification of the natural landscape and potential loss of the integrity of the NHT. Impacts would range from moderate to major along these sections of the NHT. Impacts would be minor along the remaining sections of the NHT.

Impacts from Cultural

Impacts would be the same as described under Alternative B.

Impacts from Recreation

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Impacts from Lands and Realty (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Alternative D

Impacts from Visual

Impacts would be the same as described under Alternative C.

Impacts from Cultural

Impacts would be the same as described under Alternative B.

Impacts from Recreation

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Impacts from Lands and Realty (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Alternative E, Preferred

Impacts from Visual

Impacts would be the same as described under Alternative B.

Impacts from Cultural

Impacts would be the same as described under Alternative B.

Impacts from Recreation

Impacts would be the same as described under Alternative A.

Impacts from Special Area Designations (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Impacts from Lands and Realty (Arizona Strip FO only)

Impacts would be the same as described under Alternative A.

Cumulative Impacts

The geographic area of analysis for cumulative impacts to the Old Spanish NHT is the Planning Area and surrounding communities. The NHT is primarily affected by the OHV use and the existing ROW corridor. To a lesser extent, visitation and vandalism of the NHT would also affect its integrity. Population growth and the resulting increase in recreational use are expected to have a significant impact on the NHT and its historic setting. Additional population, particularly in the Mesquite and Lincoln County area, would result in more recreational use of the NHT, increasing OHV traffic along the trail corridor, more vandalism, and more demands for use of the ROW corridor over the life of the plan.

ADMINISTRATIVE DESIGNATIONS: AREAS OF CRITICAL ENVIRONMENTAL CONCERN

The primary issue associated with ACECs involves the number and size of ACECs proposed under each of the Alternatives.

Methods and Assumptions

This section identifies changes in number and size of ACECs within the Planning Area. Specific impacts to various resources from the continuation, designation, or elimination of ACECs are discussed under the specific resource management programs. Only impacts to ACECs in Parashant and Arizona Strip FO are addressed since no ACECs currently exist in Vermilion and none are proposed under any of the alternatives.

Impacts to ACECs

Impacts to ACECs would result from actions proposed under the following resource management programs:

- Special Status Species
- Cultural Resources
- Special Area Designations (ACECs)

Alternative A: No Action

Impacts from Special Status Species

In Parashant under Alternative A, designation of the Pakoon ACEC would continue at 76,014 acres for protection of the threatened desert tortoise and Mojave Desert Ecological Zone values.

In the Arizona Strip FO under Alternative A, the eight ACECs designated to protect special status species would continue at their current acreage. These include the Beaver Dam Slope (51,197 acres), Fort Pearce (916 acres), Johnson Springs (2,464 acres), Lost Spring Mountain (8,262 acres), Marble Canyon (11,012 acres), Moonshine Ridge (5,095), Virgin River Corridor (8,075 acres), and Virgin Slope (39,931 acres) ACECs for a total of 126,952 acres.

Impacts from Cultural Resources

In Parashant, the two ACECs designated to protect cultural resources would continue at their current acreage. These include the Witch Pool ACEC at 279 acres and Nampaweap ACEC at 535 acres, for a total of 814 acres.

In the Arizona Strip FO, the four ACECs designated to protect cultural resources would continue at their current acreage. These include Little Black Mountain (241 acres), Johnson Springs (2,464 acres), Lost Spring Mountain (8,262 acres), and Moonshine Ridge (5,095 acres) ACECs, for a total of 16,062 acres.

Impacts from Special Area Designations

All existing ACECs in Parashant (77,463 total acres) and Arizona Strip FO (127,193 total acres) would continue to be managed at their current acreage. See special status species and cultural resources management programs above for details on specific ACECs.

Alternative B

Impacts from Special Status Species

In Parashant, the Pakoon ACEC designation would not continue under Alternatives B because the Monument designation provides protection to threatened desert tortoises for which the ACEC was established.

In the Arizona Strip FO under Alternative B, six of the existing ACECs would increase in size, with Marble Canyon ACEC experience the greatest increase (over nine times its current size); Johnson Spring ACEC would decrease by 406 acres; and Virgin River Corridor ACEC would be roughly a quarter in size. When combined, the eight existing special status species ACECs would equal 231,775 acres, a gain of 104,823 acres compared to Alternative A. Impacts to ACECs would be major.

Also under Alternative B in the Arizona Strip FO, eleven new ACECs would be designated, including Black Knolls, Buckskin, Clayhole, Coyote Valley, Gray Points, Hurricane Cliffs, Kanab Creek, Lime Kiln/Hatchet Canyon, Lone Butte, Shinarump, and Twist Hills ACECs, for a total of 76,374 acres. When combined, the number of acres falling within ACEC designation

under Alternative B would be more than double that proposed under Alternative A (308,393 acres compared to 127,193 acres). Impacts to ACECs would be major.

Impacts from Cultural Resources

In Parashant, the Witch Pool and Nampaweap ACEC designations would not continue under Alternatives B because the Monument designation provides protection of cultural resources for which the ACECs were established.

In the Arizona Strip FO under Alternative B, Lost Spring Mountain and Moonshine Ridge ACECs would increase in size, Little Black Mountain ACEC would remain the same, and Johnson Spring ACEC would decrease by 406 acres. When combined, the four existing cultural ACECs would equal 29,274 acres, an increase of 13,212 acres compared to Alternative A.

Also under Alternative B in the Arizona Strip FO, four new ACECs would be designated for the protection of cultural resources; these include Marble Canyon, Kanab Creek, Lone Butte, and Shinarump ACECs. While Marble Canyon ACEC is an existing ACEC designated to protect an endangered cactus that would be continued under Alternative A, it would be expanded in both scope (to include cultural resources) and size (nearly ten times the current number of acres) under Alternative B. When combined, the number of acres designated as ACECs for the protection of cultural resources under Alternative B would be more than nine times that proposed under Alternative A (150,080 acres compared to 16,062 acres).

Impacts from Special Area Designations

In Parashant, all existing ACECs in Parashant would be de-designated. See special status species and cultural resources management programs above for details on specific ACECs.

In the Arizona Strip FO, Alternative B would involve the most acres and largest number of ACECs compared to the other alternatives. The twelve existing ACECs would continue, many of them increasing in size, while 14 new ACECs would be designated. When added, 308,393 acres would be under ACEC protection under Alternative B, which is over twice as many acres than under Alternative A. See special status species and cultural resources management programs above for details on changes to specific ACECs under Alternative B.

Alternative C

Impacts from Special Status Species

In Parashant, impacts would be the same as described under Alternative B. Under Alternative C in the Arizona Strip FO, four of the existing ACECs would increase in size while four would decrease in size. When combined, the eight existing special status species ACECs would equal 120,669 acres, a loss of 6,283 acres compared to Alternative A. Impacts to ACECs would be

moderate. Three additional ACECs, Kanab Creek, Lone Butte, and Black Knolls would be created, adding 11,191 acres for a total of 131,860 special status species acres under Alternative C, 4,908 more acres than under Alternative A. Impacts would be moderate.

Impacts from Protection of Resources: Cultural Resources

In Parashant, impacts would be the same as described under Alternative B. Under Alternative C in the Arizona Strip FO, Johnson Springs, Lost Spring Mountain, and Moonshine Ridge ACECs would decrease in size, while Little Black Mountain ACEC would remain the same size. When combined, the four existing cultural ACECs would equal 9,233 acres, a decrease of 6,828 acres compared to Alternative A.

Also under Alternative C in the Arizona Strip FO, Marble Canyon, Kanab Creek, Lone Butte, and Shinarump ACECs would be designated for the protection of cultural resources for an additional 32,270 acres. The total the number of acres designated as ACECs for the protection of cultural resources under Alternative C would be over two and a half times of that proposed under Alternative A (41,503 acres compared to 16,062 acres).

Impacts from Special Area Designations

In Parashant, impacts would be the same as described under Alternative B. Under Alternative C in the Arizona Strip FO, seven of the existing ACECs would decrease in size, three would increase in size, while one would remain the same. In addition, two new ACECs would be designated. When added, 132,101 acres would be under ACEC protection under Alternative C, 4,910 more acres than proposed under Alternative A, which is a 4 percent increase. See special status species and cultural resources management programs above for details on changes to specific ACECs under Alternative B.

Alternative D

Impacts from Special Status Species

In Parashant, impacts would be the same as described under Alternative B. Under Alternative D in the Arizona Strip FO, only four of the existing ACECs (Beaver Dam Slope, Marble Canyon, Virgin River Corridor, and Virgin Slope) would retain their designation. When combined, these would equal 106,179 acres, 20,773 less acres than under Alternative A. No new ACECs would be designated.

Impacts from Cultural Resources

In Parashant, impacts would be the same as described under Alternative B. Under Alternative D in the Arizona Strip FO, Little Black Mountain is the only preexisting ACEC designated to protect cultural resources that would be continued. Marble Canyon ACEC would be expanded to

include protection of cultural resource values. Marble Canyon and Little Black Mountain ACEC, when combined, would comprise 12,166 acres, which is the fewest ACEC acres designated to protect cultural resources among the alternatives and 3,896 less acres compared to Alternative A.

Impacts from Special Area Designations

In Parashant, impacts would be the same as described under Alternative B. Under Alternative D in the Arizona Strip FO, seven of the existing ACECs would be de-designated and one existing ACEC would expand its scope to cover protection of cultural resources. When added, 106,420 acres would be under ACEC protection under Alternative D, which is 20,773 fewer acres than proposed under Alternative A, which is a 16 percent decrease. Overall, Alternative D would result in the least number and acres of ACECs proposed among the Alternatives. See special status species and cultural resources management programs above for details on changes to specific ACECs under Alternative B.

Alternative E: Preferred

Impacts from Special Status Species

In Parashant, impacts would be the same as described under Alternative B. Under Alternative E in the Arizona Strip FO, six of the existing ACECs would increase in size, while two would decrease. When combined, the eight existing special status species ACECs would equal 138,636 acres, a gain of 11,684 acres compared to Alternative A.

Also under Alternative E in the Arizona Strip FO, five new ACECs would be designated, including Black Knolls, Coyote Valley, Kanab Creek, Lone Butte, and Shinarump, for a total of 19,524 acres. When combined with the existing ACECs, there would be 31,205 more acres designated as ACECs under Alternative E compared to Alternative A.

Impacts from Cultural Resources

In Parashant, impacts would be the same as described under Alternative B. Under Alternative E in the Arizona Strip FO, Lost Spring Mountain, Moonshine Ridge, Johnson Spring, and Little Black Mountain ACECs would remain the same. When combined, the four existing cultural ACECs would equal 29,274 acres, an increase of 13,212 acres compared to Alternative A, which is the same as under Alternative B.

The same four new ACEC designations proposed under Alternative B in the Arizona Strip FO would also occur under Alternative E. Acreages would be the same with the exception of Marble Canyon ACEC, which would be 9,852 acres (92,289 less acres than under Alternative B). When combined, the number of acres designated as ACECs for the protection of cultural

resources under Alternative E would be 57,791 acres, over three and a half times that proposed under Alternative A.

Impacts from Special Area Designations

In Parashant, impacts would be the same as described under Alternative B. Under Alternative E in the Arizona Strip FO, eight of the existing ACECs would increase in size, three would decrease in size, while one would remain the same. In addition, nine new ACECs would be designated. When added, 158,398 acres would be under ACEC protection under Alternative E, which is 31,205 more acres than proposed under Alternative A, a 25 percent increase. See special status species and cultural resources management programs above for details on changes to specific ACECs under Alternative B.

ADMINISTRATIVE DESIGNATIONS: RESOURCE CONSERVATION AREAS

The primary issue associated with RCAs involves the number and size of RCAs proposed under each of the Alternatives.

Methods and Assumptions

This section identifies changes in number and size of RCAs within the Planning Area. There are currently three RCAs within the Planning Area, two in Parashant and one in Vermilion. These RCAs would continue under Alternative A while they would be eliminated under all other Alternatives. All impacts to RCAs under the action alternatives would thus be major.

Impacts to RCAs

Impacts to RCAs would result from actions proposed under the following resource management programs:

- Special Area Designations (RCAs)

Alternative A: No Action

Special Area Designations

In Parashant under Alternative A, recognition of the Parashant Area RCA would continue at 39,868 acres and recognition of the Mt. Trumbull Area RCA would continue at 102,307 acres. In Vermilion, recognition of the Canyons and Plateaus of the Paria RCA would continue at 293,689 acres.

*Alternatives B, C, D, and E (Preferred Alternative)*Special Area Designations

In Parashant, recognition of the Parashant Area and Mt. Trumbull Area RCAs would not continue under Alternatives B, C, D, or E because the Monument designation provides protection of the unique resources for which the RCAs were established. In Vermilion, recognition of the Canyons and Plateaus of the Paria RCA would not continue under Alternatives B, C, D, or E because the Monument designation provides protection of the unique resources for which the RCA was established.

IMPACT TO SOCIAL AND ECONOMIC CONDITIONS**SOCIOECONOMICS**

As described in Chapter 3 and detailed in Appendix 3.I, the socioeconomic study area expands over portions of three states and five counties that are sparsely populated but with exceptional growth rates. Management actions that influence employment, demands for goods and services, business growth, and visitation within this broad study area would affect socioeconomics. Impacts would most greatly be felt in small rural communities that economically and socially rely, at least partially, on resources uses within the Planning Area, including harvesting vegetation products, grazing livestock, extracting minerals, recreating, and traveling.

Decisions made in regards to the transportation system in the Planning Area could affect the study area's economy by expanding or limiting access to recreation, ranching, mining, or vegetative product-related activities. Designating certain areas as either open, limited to designated roads and trails or to existing roads and trails, or closed, would place new restrictions on OHV enthusiasts, which could impact revenues created directly or indirectly by this form of recreation (e.g., OHV and associated equipment and fuel sales, OHV repairs, dining, lodging, etc.). Increased or decreased non-motorized backcountry opportunities could also impact revenues created directly or indirectly for individuals seeking those types of recreation opportunities (e.g., backpacking supplies, horse boarding and supplies, dining, lodging, etc.).

Allowing or preventing the sale or free use of vegetative products (e.g., native seed, medicinals, propagation materials, florals/greens/craft markets, mosses, mushrooms, lichens, landscape mulch, poles, fuel wood, Christmas trees, lumber, pinyon nuts, etc.) would impact local businesses or individuals who rely on such use.

Hunting management and the number and types habitat improvement projects aimed at improving health and vitality of game animals, specifically big game such as trophy mule deer, would affect local economies in terms of influencing the number and types of hunters coming to the Planning Area and the number and success of professional outfitters.

Actions that increase mining activities would tend to stimulate the local and regional economies, both through increased employment and demand for goods and services for the mining operation itself. Duration of this effect would depend upon the magnitude of mineral deposits and market demand for the products. Conversely, actions eliminating current mining activities or discouraging or precluding new mining activities would tend to decrease or at least limit local and regional economic benefits.

Any action that enhances the quality of recreation experience or creates additional facilities or improved access would potentially increase visitation demand. Increased visitation would stimulate increased expenditures for goods and services in the local and regional economies. This in turn would tend to encourage additional business activity and population growth. Changes in allowable grazing could influence ranchers within the Planning Area, which, in turn, could affect local communities dependent upon ranching operations in terms of tax revenue from livestock sales, purchase of equipment and feed, etc. This directly influences the economic viability and scale of existing ranching operations.

Land disposals that ultimately lead to development for residential use or commercial and light industrial development, would have an economic impact in terms of employment and earnings, as well as increased tax base for the area.

Methods and Assumptions

The analysis of potential impacts to socioeconomics is based on the expertise of BLM resource specialists at the Arizona Strip FO and the NPS staff at Lake Mead NRA. Combined, these staff members possess an extensive knowledge of socioeconomic-related issues within the Planning Area. In addition, concerns were gathered from communities through town-hall type meetings that are used in the analysis. The impact analysis is also based on review of existing literature and information provided by non-planning team experts in the BLM, NPS, and other agencies.

- Negligible:** Overall impacts on employment, demand for goods and services, and business growth within the study area would not be detectable. In general, businesses (including ranching operations) would not experience much growth or decline.
- Minor:** Overall impacts on employment, demand for goods and services, and business growth within the study area would not be detectable. Some small businesses (including ranching operations) would experience slight growth or decline, with a few jobs being lost or gained.
- Moderate:** Overall impacts on employment, demand for goods and services, and business growth within the study area would be slight. Impacts at the local level would be more apparent as several small to medium-sized businesses (including ranching

operations) would experience some growth or decline, with a several jobs being lost or gained, although not detectable in the communities employment rate.

Major: Overall impacts on employment, demand for goods and services, and business growth within the study area would be apparent. Impacts at the local level would be extensive, as numerous businesses (including ranching operations) would experience extended growth or decline, with some businesses closing new businesses being formed. The number of jobs being lost or gained would reflect in the particular communities' employment rate.

Impacts to Socioeconomics

Impacts to socioeconomics would result from actions proposed under the following resource management programs:

- Trails and Travel Management
- Vegetation
- Fish and Wildlife
- Minerals (Arizona Strip FO only)
- Livestock Grazing
- Recreation
- Lands and Realty

Alternative A: No Action

Impacts from Trails and Travel Management

Under Alternative A, no parts of the Monuments would be open to motorized and mechanized cross-country vehicle travel as motor vehicles would be restricted to designated roads. While this would restrict OHV use off designated roads and trails, OHV and other motorized vehicle users would have access to 1,700 miles of roads in Parashant and 444 miles of roads in Vermilion for purposes of exploring and recreating.

This recreation opportunity compounded by the projected increased population growth in the socioeconomic study area encompassing the Monuments would result in increased visitation, which in turn, would have a minor to moderate impact on local economies. Those desiring non-motorized forms of recreation would also utilize the transportation system under Alternative A as a means to access more remote portions of the Monuments. Ranchers needing to access their operations could also use the open roads, thus allowing for the continued economic contribution ranching has on the study area's economy.

In the Arizona Strip FO under Alternative A, 803 acres would be open to motorized and mechanized cross-country vehicle travel, which would provide a limited amount of recreational

opportunities for OHV users and other off-road enthusiasts. In addition, the public would have access to 492 miles of roads in the Littlefield area and 4,361 miles of roads throughout the remainder of the Arizona Strip FO for purposes of exploring and recreation. This recreation opportunity compounded by the projected increased population growth in the socioeconomic study area encompassing the Arizona Strip FO would result in increased visitation, which, in turn, would have a minor to moderate impact on local economies. Impacts would be greatest felt in the small communities the within the Arizona Strip FO boundaries, including Fredonia, Colorado City, and the Marble Canyon area. Those desiring non-motorized forms of recreation would also utilize the transportation system under Alternative A as a means to access more remote portions of the Arizona Strip FO. The open roads could also be used by ranchers needing to access their operations, thus allowing for the continued economic contribution ranching has on the study area's economy. Permittees would also have access to an additional nine miles of roads in the Littlefield area and seven miles within the remainder of the Arizona Strip FO that would be open to administrative use only.

Impacts from Vegetation and Fire and Fuels Management

Although Parashant would be closed to the sale of vegetative products, the sale, collection, or use of vegetative material (e.g., native seed, medicinals, landscape mulch, posts, fuel wood, etc.) could be allowed in the Monument, by permit only, if associated with research or restoration project. Since the amount harvested would be minimal, economic impacts would be negligible. Vermilion would also be closed to the sale of vegetative products. Since the area contains limited vegetative resources of any economic value, impacts would be negligible. In the Arizona Strip FO, personal Christmas tree and post cutting would be allowed, providing a service to those communities within and adjacent to the Arizona Strip FO. Since overall use would be minimal, economic impacts would be negligible.

Impacts from Fish and Wildlife

Improving mule deer habitat where needed would help maintain trophy deer numbers. This, in turn, would continue to attract hunters to the BLM portion of the Monument and economically benefit businesses. Protecting and/or enhancing habitats of other forms of wildlife (e.g., bighorn sheep, pronghorn antelope, migratory birds, and Merriam's Turkey) would also provide wildlife-viewing opportunities that would benefit local businesses catering to such users. In Parashant, continuing to manage the Mt. Trumbull Watchable Wildlife Area would also continue to attract visitors into the area.

Impacts from Minerals (Arizona Strip FO only)

Closing or withdrawing areas from mineral operations (i.e., fluid mineral leasing, mining, and mineral material disposals) would directly limit the amount of economic development based on mineral operations and sales, while designating areas open would support economic development. The primary current mineral operation in the Arizona Strip FO is gypsum mining

near Black Rock Gulch, which contributes to the local economies, specifically adding jobs in the St. George area. Management actions related to locatable minerals under Alternative A (e.g., acres open to operation of the mining laws with or without restrictions or a mining plan and acres withdrawn to mining location) would allow continued mining of the rich gypsum deposits south of St. George and allow for expansion of such projects.

Impacts from Livestock Grazing

In Parashant, under Alternative A, the NPS portion of the Parashant Allotment, portions of the Mosby-Nay and Tassi Allotments identified in the 1998 LUP amendment, Burro Springs Pasture of the Pakoon Springs Allotment, Grand Gulch Wash area of the Pakoon Allotment, and the entire Home Ranch Allotment would be closed to grazing. Such closures would reduce the amount of allotment acres and AUMs used by the particular ranchers using such allotments, and could potentially result in some economic hardship for the particular grazing operation. Impacts to the study area's socioeconomic resources would be negligible.

In Vermilion, the limits placed on the Lees Ferry Allotment would place some economic burden on the permittee using that allotment. Impacts to the study area's socioeconomic resources would be negligible.

No allotments would be closed under Alternative A in the Arizona Strip FO. The desert tortoise allotments would be open seasonally for grazing, with no authorization for ephemeral extension. The Cedar Wash Allotment would be open seasonally for grazing, with ephemeral extensions, and seasonal restrictions would apply in specific southwestern willow flycatcher habitats. These grazing restrictions would continue to place some minor economic burden on the permittee using that allotment. Impacts to the study area's socioeconomic resources would be negligible.

Impacts from Recreation

Regardless of alternative, visitor use is expected to increase throughout the Planning Area, especially in the Monuments. This would partially be the result of the rapidly growing communities and counties in the study area, as well as new interest created for visiting the Planning Area since the Monuments were designated (i.e., as a result of a "designation effect"). One study showed that 87 percent of those surveyed who visited Parashant came from either one of the three states in the study area (Northern Arizona University 2003), all of which showed phenomenal growth over the past few decades. Based solely on projected growth of the counties within the study area (with the exception of Lincoln County, Nevada, which would contribute little in terms of overall visitation numbers), total visitation would increase by 31% between 2000 and 2010. This increased visitation would have economic impacts to communities in the study area that serve as stopping points for services near the Monuments. The small communities within and near the Planning Area's boundaries would feel the greatest impacts, including Mesquite and Bunkerville in Nevada and Fredonia; Colorado City, Page, the Virgin River Communities and the Marble Canyon Area in Arizona; and Big Water, Utah.

Placing visitor limits and applying regulations or restrictions could limit visitation at some sites and reduce the economic benefit of visitation in the area. However, such practices would only occur when monitoring of resource and social conditions indicates a trend toward unacceptable change brought about by visitation. Impacts would thus be negligible. Visitation restrictions placed in listed species and other sensitive habitat and restrictions on recreational stock use could discourage some recreationists. Retaining restrictions and fees placed on recreation use in Paria Canyon, Buckskin Gulch, Wire Pass and Coyote Buttes (Vermilion) and continuing the current recreation use permits and use fees program required for use in the Virgin Gorge Recreation Area (Arizona Strip FO) would maintain the current amount of use, thus limiting the amount of economic contribution from recreation within these areas. Maintaining existing SRMA designations to ensure greater recreation emphasis and investment and providing some managing visitor facilities (e.g., interpretive, safety, and informative signs; kiosks; interpretive sites; etc.) would help improve visitor experiences and potentially encourage return trips. Allowing the Rhino Rally motorcycle race in the Arizona Strip FO would continue to provide economic benefits from rally participants and observers who patronize local businesses. Overall impacts from recreation management actions would be negligible compared to the expected trend of visitor growth with or without such actions.

Impacts from Lands and Realty

As mandated by the Monument proclamations, appropriating and withdrawing all federal lands and interests in lands from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws would allow no economic development or community growth within the Monuments. Processing no new ROWs and ancillary public facilities, with a few exceptions, would limit growth within the Monuments. While such impacts could affect communities adjacent to Vermilion in the Marble Canyon area as the area grows in the future, overall impacts would be negligible.

In the Arizona Strip FO, management actions aimed at reaching the goal of supporting community growth and expansion needs by making public lands available for recreation, public purposes, and other infrastructure needs would be beneficial for the study area's economy. This includes making up to 7,335.45 acres available for exchange, sale, or R&PP sale and an additional 17,853.47 acres available for exchanges only. These land disposals could lead to development for residential use or commercial and light industrial development, would have an economic impact in terms of employment and earnings, as well as increased tax base for the area. Impacts could range from minor to moderate in the communities directly affected.

Alternative B

Impacts from Trails and Travel Management

Impacts would be similar to that described under Alternative A due to no roads being open to motorized and mechanized cross-country vehicle travel. However, the public would have access to less than half the miles of roads for purposes of exploring and recreating by motorized and mechanized means compared to Alternative A. This could limit the number of visitors seeking motorized forms of recreation and/or result in negative experiences due to traffic levels on roads that would remain open. It would also affect those individuals seeking areas to engage in non-motorized activities. While Alternative B would increase the miles of roads and trails for non-motorized forms of recreation, it would also make many areas inaccessible by limiting motorized access necessary to reach such areas. The impact to local businesses in communities near the Monuments that are compatible with motorized, and to a less extent non-motorized activities would range from minor to moderate, with the greatest effects being felt in the smaller communities more dependent upon recreation within the Monuments. While ranchers would also be impacted, they would be allowed access to their ranching operations due to 703 miles of roads in Parashant and 174 miles of roads in Vermilion open to administrative use only, resulting in a negligible economic impact.

Under Alternative B, no part of the Arizona Strip FO would be open to motorized and mechanized cross-country vehicle travel, which would prohibit cross-country recreational opportunities for OHV users and other off-road, motorized enthusiasts. This would reduce the number of individuals coming into the area for such activities and thus directly reduce the amount of economic contribution such recreationists would make to the local economies. However, economic impacts would be negligible considering the relatively few acres open in Alternative A, which could only support a minimum number of OHV users. Within the Littlefield Area, the public would have access to less than half the miles of roads for recreating and exploring purposes compared to Alternative A, further decreasing the economic benefit stemming from such activities within the Littlefield area. Impacts would be minor. The same number of miles of roads would be open to motorized travel throughout the remainder of the Arizona Strip FO as under Alternative A, resulting in the similar socioeconomic impacts.

The majority of the Monuments (86-87 percent) would be under the Primitive TMA under Alternative B. This TMA emphasizes semi-primitive and non-motorized/primitive experiences, which entails more restrictions on motorized forms of travel, especially for recreation purposes. This would reduce opportunities for motorized forms of recreation, affecting those businesses surrounding the Monuments that are dependent upon such forms of recreation. In comparison, there would be greater opportunity for visitors to engage in non-motorized activities (e.g., hiking, back packing, horseback riding) that would benefit businesses dependent upon non-motorized forms of recreation. Overall impacts would range from minor to moderate, being strongest felt

by the smaller, more tourist-oriented communities (e.g., Fredonia, Virgin River Communities, Bunkerville, Marble Canyon Area, Page, and Big Water) surrounding the Monuments.

In the Arizona Strip FO, the most concentrated and widest variety of motorized, non-motorized, and mechanical use would occur within the Rural TMA, which would comprise nine percent of the Arizona Strip FO under Alternative B. Travel in this TMA would primarily affect those users living within and adjacent to the Monuments. Although most travel within the Rural TMA would involve locals and thus not bring in outside dollars, travel opportunities serving recreational, traditional, casual, commercial, education, and private access needs would be attractive to individuals and businesses who become motivated to move into the area. Such opportunities would also improve the style of living within the communities involved, potentially increasing property values. Alternative B, however, would concentrate more on non-motorized forms of recreation activities, specifically within TMD-D, which would make up 37 percent of the Arizona Strip FO. This would allow opportunities for visitors to engage in non-motorized activities (e.g., hiking, back packing, horseback riding) that would benefit businesses dependent upon non-motorized forms of travel, although it would limit some opportunities for motorized forms of travel. Overall impacts would range from minor to moderate, being strongest felt by the smaller, more tourist-oriented communities nestled within the Arizona Strip FO (e.g., the Marble Canyon Area, Colorado City, and Littlefield).

Impacts from Vegetation and Fire and Fuels Management

In the Monuments, impacts would be the same as described under Alternative A. In the Arizona Strip FO, the sale, collection, or use of vegetative materials (e.g., native seed, medicinals, landscape mulch, posts, fuel wood, Christmas trees, lumber, etc.) would be allowed in the Arizona Strip FO by permit only. This would benefit individuals living within or adjacent to the planning areas. Overall use would be minimal, resulting negligible impacts area-wide. Some businesses relying on vegetative materials (e.g., nurseries, individual who sale firewood, ranchers needing on poles for fences, etc.) could experience minor economic impacts

Impacts from Fish and Wildlife

Additional emphasis on habitat management for healthy self-sustaining mule deer populations and providing quality buck hunting opportunities would improve trophy deer numbers and potentially increase hunter interest in Parashant. Additional emphasis on maintaining healthy, self-sustaining populations of bighorn sheep, pronghorn antelope, Kaibab squirrels, cottontail rabbits, waterfowl, game birds, carnivores, and furbearers would also support hunting and/or wildlife viewing throughout the Planning Area. This would increase the benefit to businesses supporting hunting and wildlife viewing in the surrounding communities. As under Alternative A, continuing to manage the Mt. Trumbull Watchable Wildlife Area would also continue to attract visitors into the area. Since overall hunter/viewer numbers would remain small, overall economic impacts would be negligible; however, some guide services/outfitters may experience minor impacts.

Impacts from Minerals (Arizona Strip FO only)

Impacts to gypsum mining operations south of St. George would be similar to those described under Alternative A. Alternative B would close nearly twice as many acres to mineral material disposals compared to Alternative A. This would limit the areas where sand and gravel needed for community development could be collected, impacting both the companies providing the mineral material and communities in need of such material. Impacts would be minor.

Impacts from Livestock Grazing

Additional allotment closures and seasonal restrictions under Alternative B in Parashant would cause additional economic hardship to the ranchers affected. These include restricting portions of the Mosby-Nay Allotment from year-long use to seasonal use; closing the entire Pakoon Springs Allotment; and decreasing seasonal use of the remainder of the Pakoon Allotment by two months compared to Alternative A. In Vermilion, closing the River Pasture of the Lees Ferry Allotment would place some additional economic burden on the permittee using that allotment. In the Arizona Strip FO, the desert tortoise allotments would be closed to grazing, resulting in minor to moderate impacts to those permittees currently using those allotments. Also under Alternative B, season of use on the river portion of the Lambing Allotment would be reduced by one month, slightly affecting the permittee using that allotment. Allowing no ephemeral extensions in the Cedar Wash Allotment and establishing season of use for portions of the Littlefield and Mesquite Community Allotments would place some minor economic burden on the permittees involved. Overall impacts to the study area's socioeconomic resources would be negligible, although impacts to specific ranchers may be minor.

Impacts from Recreation

Overall impacts from increased visitor use would be similar as described under Alternative A. Additional restrictions placed on camping, firewood collecting, sensitive species habitats, concessions, SRPs, geocaching, and recreational stock use could discourage some visitors. The potential to place visitor limits, supplemental rules, or restrictions when carrying capacities are exceeded could put a cap on visitation and thus limit recreation-driven economic growth. Not allowing any motorized speed events in the Arizona Strip FO, especially the Rhino Rally, would hurt local businesses that benefited from such large-scale events in the past. Overall impacts would be negligible in the short term, but could range from minor to moderate in the long term.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A for the Monuments. Impacts would also be similar to Alternative A for the Arizona Strip FO, with the exception that 1,760 less acres would be available for sale, R&PP sale, and/or exchange, reducing the amount of economic development resulting from such actions. However, none of the lands made available under

Alternative B would be restricted to exchanges only, making it easier to purchase such lands and used for residential, commercial, or light industrial development. Overall impacts could range from minor to moderate in the communities directly affected.

Alternative C

Impacts from Trails and Travel Management

Impacts in the Monuments would be similar as described under Alternative A due to no roads being open to motorized and mechanized cross-country vehicle travel. However, the public would have access to 407 fewer miles of roads in Parashant and 70 fewer miles of roads in Vermilion for purposes of exploring and recreating compared to Alternative A. This could limit the number of visitors seeking motorized forms of recreation and/or result in negative experiences due to traffic levels on open roads. It would also affect those individuals seeking areas to engage in non-motorized activities, as it would limit motorized access necessary to reach such areas. Such impacts would be minimal compared to Alternative B. As a result, the impact to local businesses in communities near the Monuments that are compatible with motorized, and to a less extent, non-motorized activities would be minor. Ranchers would have access to an additional 222 miles of road in Parashant and 59 miles in Vermilion open to administrative use only compared to Alternative A, which would reduce the economic impact to ranching operations.

In the Arizona Strip FO under Alternative C, 678 more acres of BLM lands would be open to motorized and mechanized cross-country vehicle travel compared to Alternative A. This would provide additional recreational opportunities for OHV users and other off-road enthusiasts, although the opportunities for such activities would remain limited. Economic impacts would thus remain negligible. Within the Littlefield Area, the public would have access to 119 less miles of roads for recreating and exploring purposes compared to Alternative A, decreasing the economic benefit stemming from such activities within the Littlefield area. Impacts would be minor. The same number of miles of roads would be open to motorized travel throughout the remainder of the Arizona Strip FO as under Alternative A, resulting in the similar socioeconomic impacts.

In the Monuments, there would be fewer restrictions on motorized forms of recreation and less emphasis on non-motorized form of recreation when compared to Alternative B, with the Primitive TMA comprising 72 percent of Parashant and 67 of Vermilion, 15 percent and 19 percent less, respectively, than under Alternative B. This would increase opportunities for motorized forms of travel, especially recreation-related travel, and positively affect those businesses dependent upon such forms of travel surrounding the Monument. However, there would be less opportunity for visitors to engage in non-motorized activities (e.g., hiking, back packing, horseback riding) than under Alternative B that would slightly affect businesses dependent upon non-motorized forms of travel. Overall impacts would be minor, being strongest felt by the smaller, more tourist-oriented communities surrounding the Monuments.

Most concentrated travel would occur within the Rural TMA, which would comprise 11 percent of the Arizona Strip FO under Alternative C, which is 2 percent more than under Alternative B. As a result, Alternative C would have a slightly more positive impact on local communities in terms of providing access to BLM lands. Alternative C would concentrate slightly less on non-motorized forms of recreation activities, as the Primitive TMA would comprise 2 percent less of the Arizona Strip FO when compared to Alternative B. There would thus be a slightly greater impact to local economies in terms of providing a wider opportunity of travel opportunities, especially motorized forms of recreation that tend to generate more economic benefits to local communities.

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A for the Monuments, but the same as Alternative B for the Arizona Strip FO.

Impacts from Fish and Wildlife

Impacts would be similar to that described under Alternative A with the exception that four additional Watchable Wildlife areas would be managed in Parashant, one in Vermilion, and five in the Arizona Strip FO. Such additional Watchable Wildlife areas would potentially attract additional visitors to the area, who would bring in a few more visitor dollars to the local economies. Impacts would be negligible in the short term, but potentially minor in the long term.

Impacts from Minerals (Arizona Strip FO only)

Impacts to gypsum mining operations south of St. George would be similar to those described under Alternative A. An additional 9,181 acres would be closed to mineral material disposals compared to Alternative A, which is minimal compared to Alternative B and thus would result in negligible economic impacts.

Impacts from Livestock Grazing

Under Alternative C, the season of use would be shorter for the Mosby-Nay, Pakoon Springs, and Pakoon allotments compared to Alternative A, but longer compared to Alternative B. Such seasonal restrictions would cause additional economic hardship to the ranchers affected when compared to Alternative A, although the impact would be minor when compared to Alternative B. Alternative C would also allow ephemeral extensions in the Pakoon Allotment and the Grand Gulch Wash area would be open to grazing. This would have a greater economic benefit for the ranchers involved when compared to both Alternative A and B. Overall, economic impacts would be negligible, although impacts to specific ranchers may be minor.

Reducing the season of use on the Lees Ferry Allotment and restricting the use of the River Pasture to two years out of five would place some economic burden on the permittee using that allotment. Impacts would be less intense compared to Alternative B where the River Pasture would be closed to all livestock use. However, overall impacts to the study area's socioeconomic resources would remain negligible.

Impacts from grazing in desert tortoise allotments would be the same as under Alternative A, while impacts from a slightly shorter season of use in the Lambing allotment would be the same as under Alternative B. Ephemeral extensions to May 15 would be allowed in the Cedar Wash Allotment, which is similar to Alternative A (although different conditions apply), thus resulting in similar impacts to the permittee involved. Overall impacts to the study area would be negligible.

Impacts from Recreation

Overall impacts from increased visitor use would be similar as described under Alternative A. Fewer restrictions placed on camping in the Monuments compared to Alternative B by allowing camping in existing or disturbed areas could provide more opportunities for individuals to camp in the Monument, extending their stay and potentially spending more money in the area. Identifying two new SRMAs in each of the Monuments and three new ones in the Arizona Strip FO could help increase visitor use in the area and provide some minor economic benefit. Fewer restrictions on concessions, SRPs, geocaching, and recreational stock use compared to Alternative B could allow for increased visitor use, although increases would be slight and result in a negligible economic impact. Allowing motorized speed events in the Arizona Strip FO, such as the Rhino Rally, albeit spatially limited in a motorized speed event area, would continue to provide local businesses to receive economic benefits from such large-scale events. The potential to place visitor limits, supplemental rules, or restrictions based on Limits of Acceptable Change (LAC) models could put a cap on visitation and thus limit recreation-driven economic growth. Impacts would be negligible in the short term, but could range from minor to moderate in the long term.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A in the Monuments. Impacts would also be similar to Alternative A for the Arizona Strip FO, with the exception that 161.92 less acres would be available for sale, R&PP lease/sale, and/or exchange, reducing the amount of potential economic development resulting from such actions. Due to the small amount of land, impacts would be negligible, even less when compared to Alternative B, which proposed 1,592 less acres for disposal. Similar to Alternative B, none of the lands made available under Alternative C would be restricted to exchanges only, making it easier to purchase such lands and used for residential, commercial, or light industrial development when compared to Alternative A. Overall impacts could range from minor to moderate in the communities directly affected.

*Alternative D*Impacts from Trails and Travel Management

Impacts in the Monuments would be similar to that described under Alternative A due to no roads being open to motorized and mechanized cross-country vehicle travel. However, the public would have access to 176 fewer miles of roads in Parashant and 24 fewer miles of roads in Vermilion for purposes of exploring and recreating by motorized or mechanized means compared to Alternative A, but more miles when compared to the other alternatives. The impacts from limiting the number of visitors seeking motorized forms of recreation and access to particular destinations in the Monument for either motorized or non-motorized forms of recreation would fall somewhere between Alternative A and C. Overall impacts would be minimal compared to Alternative B. As a result, the impact to local businesses in communities near Parashant that are compatible with motorized, and to a less extent, non-motorized activities would be minor. Ranchers would have access to 92 additional miles of road in Parashant and 43 additional miles in Vermilion for administrative use only compared to Alternative A, which would reduce the economic impact to their ranching operations.

Under Alternative D in the Arizona Strip FO, nearly nine times more acres of BLM lands would be open to motorized and mechanized cross-country vehicle travel compared to Alternative A, and nearly five times the miles in comparison to Alternative C. This would provide considerably more recreational opportunities for OHV users and other off-road enthusiasts. Economic impacts would be minor. Within the Littlefield Area, the public would have access to 53 less miles of roads for recreating and exploring purposes compared to Alternative A, decreasing the economic benefit stemming from such activities within the Littlefield area. Impacts would be negligible. The same number of miles of roads would be open to motorized travel throughout the remainder of the Arizona Strip FO as under Alternative A, resulting in the similar socioeconomic impacts.

In Parashant, there would be fewer restrictions on motorized forms of recreation and less emphasis on non-motorized form of recreation when compared to Alternative B and C, with TMA D comprising 66 percent of the Monument (21 percent less than under Alternative B). This would increase opportunities for motorized forms of travel, especially recreation-related travel, and positively affect those businesses dependent upon such forms of travel surrounding the Monument. However, there would be less opportunity for visitors to engage in non-motorized activities (e.g., hiking, back packing, and horseback riding) then under Alternative B or C that would slightly affect businesses dependent upon such forms of travel. Overall impacts would be minor, being strongest felt by the smaller, more tourist-oriented communities surrounding Parashant.

In Vermilion and the Arizona Strip FO, impacts would be similar to those described under Alternative C due to the size of the Rural TMA (within a 1 percent difference).

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A for the Monuments, but the same as Alternative B for the Arizona Strip FO.

Fish and Wildlife

Impacts would be the same as described under Alternative C.

Impacts from Minerals (Arizona Strip FO only)

Impacts to gypsum mining operations south of St. George would be similar to those described under Alternative A. There would be more opportunities for mineral material disposal operations as 12,358 fewer acres would be closed to such activities compared to Alternative A. Impacts would be negligible.

Impacts from Livestock Grazing

Impacts from allotment closures, openings, and seasonal restrictions would be similar to Alternative A in Parashant, with the exception of seasonal restrictions placed on portions of the Mosby-Nay and Pakoon Springs Allotment, which could cause some economic hardship for the ranchers involved, although slightly less when compared to Alternative C as season use would be slightly longer. Opening of the Grand Gulch Wash area of the Pakoon Allotment would benefit ranchers involved. Impacts to the ranchers involved would be minor while impacts to the region would be negligible.

Impacts in Vermilion would also be similar to that described under Alternative A, including season of use on the Lees Ferry Allotment. This conclusion considers the fact that season of use on the River Pasture would be slightly longer (15 days), which would have a negligible impact on ranching operations.

Under Alternative D in the Arizona Strip FO, there would be slightly greater economic benefit to the permittees using the desert tortoise allotments than under Alternative A and C due to the option to authorize ephemeral extensions, potentially increase grazing opportunities by up to two months. In addition, the season of use for the Cedar Wash Allotment would be extended by two months. As under Alternative A, the Mesquite and Littlefield Community Allotments outside the Littlefield Slope pastures would be grazed yearlong, resulting in similar impacts. Overall, Alternative D would have the greatest benefit to grazing permittees, which could result in minor to moderate impacts to individual permittees, although overall economic impacts would remain negligible.

Impacts from Recreation

Overall impacts from increased visitor use would be similar as described under Alternative A. Impacts from allowing dispersed camping in existing or disturbed sites in the Monuments would have the same impacts as described under Alternative C. Impacts from SRMA allocations would be the same as described under Alternative C, with the exception that two additional SRMAs would be allocated in Vermilion and three in the Arizona Strip FO would potentially attract more visitors to the area and benefit local economies, although such impacts would be minor. The potential to place visitor limits, supplemental rules, or restrictions based on case-by-case studies could put a cap on visitation and thus limit recreation-driven economic growth. Impacts would be negligible in the short term, but could range from minor to moderate in the long term.

Actively seeking concession and vending lease proposals in the Arizona Strip FO would potentially create more opportunities to service the growing visitor populations. Allowing motorized speed events in the Arizona Strip FO on a case-by-case basis would be less restrictive than under Alternative C and thus create the conditions for potentially more such events, which would benefit the local economy.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A for the Monuments, but the same as described under Alternative C for the Arizona Strip FO.

Alternative E: Preferred

Impacts from Trails and Travel Management

Impacts in the Monuments would be similar to that described under Alternative A due to no roads being open to motorized and mechanized cross-country vehicle travel. However, the public would have access to 303 fewer miles of roads in Parashant and 60 fewer miles of roads in Vermilion for purposes of exploring and recreating compared to Alternative A. The impacts from limiting the number of visitors seeking motorized forms of recreation and access to particular destinations in the Monument for either motorized or non-motorized forms of recreation would be greater than under Alternatives A and D, but less when compared to Alternatives B and C. Overall impact to local businesses in communities near Parashant that are compatible with motorized, and to a less extent, non-motorized activities would be minor. Ranchers would have access to an additional 158 miles of road in Parashant and 53 miles in Vermilion open to administrative use only compared to Alternative A, which would reduce the economic impact to ranching operations.

In the Arizona Strip FO, impacts from areas open to motorized and mechanized vehicle use would be similar to those described under Alternative D. Under Alternative E, 61 fewer miles would be open to motorized travel by the public within the Littlefield Area compared to

Alternative D and 114 less compared to Alternative A, decreasing the economic benefit stemming from such activities within the Littlefield area. Impacts would be negligible. The same number of miles of roads would be open to motorized travel throughout the remainder of the Arizona Strip FO as under Alternative A, resulting in the similar socioeconomic impacts.

Impacts from TMA delineations in the entire Planning Area would be similar to those described under Alternative D due to similar acres delineated (within a 1 percent difference).

Impacts from Vegetation and Fire and Fuels Management

Impacts would be the same as described under Alternative A for the Monuments, but the same as Alternative B for the Arizona Strip FO.

Impacts from Fish and Wildlife

Impacts would be the same as described under Alternative C.

Impacts from Minerals (Arizona Strip FO only)

In the Arizona Strip FO, impacts to gypsum mining operations south of St. George would be similar to Alternative A. An additional 35,074 acres would be closed to mineral material disposals compared to Alternative A. This is more acres proposed closed than Alternatives C and D, but less than under Alternative B. Impacts would be from negligible to minor.

Impacts from Livestock Grazing

Impacts from allotment closures, openings, and seasonal restrictions in Parashant would be similar to either Alternative C or D, depending upon the allotment. Impacts in Vermilion would be the same as Alternative B. Impacts from grazing restrictions on the desert tortoise allotments in the Arizona Strip FO would be the same as under Alternatives A, while impacts from grazing on the Mesquite and Littlefield Community Allotments would be the same as under Alternative C. Impacts from grazing on Cedar Wash Allotment would be the same as under Alternative D, while grazing on the Clearwater portion of the Kanab Creek Allotment and the Wildband Allotment would be the same as described under Alternative B. Grazing in the Lambing Allotment would be reduced by two weeks compared to Alternative A and D, slightly increasing the economic burden felt by the permittee using that allotment. Overall, economic impacts would be negligible.

Impacts from Recreation

Overall impacts from increased visitor use would be similar as described under Alternative A. Impacts from allowing dispersed camping in existing or disturbed sites in the Monuments would have the same impacts as described under Alternative B. Impacts from SRMA designations

would be the same as described under Alternative D. The potential to place visitor limits, supplemental rules, or restrictions based on carrying capacities supplemented by LAC models could put a cap on visitation and thus limit recreation-driven economic growth. Impacts would be negligible in the short term, but could range from minor to moderate in the long term.

In the Arizona Strip FO, impacts from dispersed camping would be the same as under Alternative A while impacts from concession lease proposals, SRP administration, and motorized speed events would be the same as under Alternative C.

Impacts from Lands and Realty

Impacts would be the same as described under Alternative A for the Monuments, but the same as Alternative C for the Arizona Strip FO.

ENVIRONMENTAL JUSTICE

Impacts to Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," requires each agency to identify and address disproportionately high and adverse effects on human health or environmental effects of its activities on minority and low-income populations.

Chapter 3 established the socioeconomic study area is predominately white. The exceptions include Coconino County, Arizona; Clark County, Nevada; the community of Page, Arizona; and the Kaibab Paiute Tribe. No disproportionate adverse impacts to these areas of higher density minority populations would occur from implementation of any of the management actions, resource programs, or objectives proposed under any of the alternatives. Impacts would thus be negligible.

American Indians within the Study area have subsistence use (e.g., pinyon nut harvesting) and cultural ties to BLM and NPS lands in the Planning Area. Refer to the discussions on impacts to American Indian Resources within the Cultural Resources section of this chapter for a discussion of impacts to such subsistence uses.

Chapter 3 also established that roughly half of the communities within the study area fell beneath the national poverty level for families. No disproportionate adverse impacts to low-income populations would occur from implementation of any of the management actions, resource programs, or objectives proposed under any of the alternatives. Impacts would thus be negligible.

HEALTH AND SAFETY

Impacts to Health and Safety

While 16 abandoned mines throughout the Planning Area are considered public safety hazards and/or suspected environmental concerns due to potentially containing hazardous materials, access to these mines would be controlled with warning signs and barriers, with some being reclaimed or closed subject to funding. None of the management actions would increase public exposure to the risks associated with these abandoned mines. As a result, impacts would be negligible and not analyzed further.

Remediation of contaminated and hazardous sites is necessary for compliance with applicable federal and state rules and regulations. No hazardous or solid waste sites are known to occur on public lands within the Planning Area. Incidental dumping of hazardous materials occurs, but is rare and concentrated mostly in close proximity to towns and highways primarily within the Arizona Strip FO. Public health and safety management actions have been proposed under all alternatives for all three planning areas that address prevention and cleanup of such sites, as well as other health and safety concerns. None of the management actions proposed by the alternatives would require the handling, storage, or release of hazardous, toxic, or unapproved solid wastes that would cause health and safety concerns. Small amounts of fuels, chemicals, or other vegetation treatment products would be used throughout the Planning Area, but amounts would be relatively small and mostly applied away from populated areas. As a result, health and safety impacts would be negligible and not analyzed any further.

CUMULATIVE IMPACTS

Cumulative impacts are those effects on the environment that result from incremental impacts of management direction contained in this Draft Plan/DEIS when added to the effects of other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal, Tribal, state, or local) or private entity undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508). Analysis focuses on the cumulative impacts of the preferred alternative for this Draft Plan/DEIS and other actions both within and outside of the Planning Area.

Potential cumulative impacts, projects, and actions in the Planning Area were determined by examining other plans in the region, by talking with local governments and state and federal land managers, and from information provided by the BLM and NPS staff. The area of primary concern for cumulative impacts related to this plan is northern Mohave and Coconino counties north of the Grand Canyon in Arizona, southern Washington and Kane counties in Utah, and eastern Clark County and southeastern Lincoln counties in Nevada. Projects outside these areas were also considered if they have the potential to affect resources in the region. Cumulative impact analyses are also presented at the end of each impact topic discussion in this chapter

TIMEFRAME FOR ANALYSIS

The timeframe for this cumulative impact analysis encompasses past activities for the past one hundred years in the Planning Area. It also includes present activities and future activities that may extend 20 years into the future, which is the assumed life of the management plans.

Past Actions

Federal designations and administration: Much of the land in the region is contained within national parks, national forests, NRAs, national monuments, wilderness areas, and tribal reservations. These lands are withdrawn from mineral entry and retained under federal or tribal administration. This preserves open space, and natural and cultural landscapes in the region, but it also puts developmental pressure on the private and state lands available for development, most of which would likely be developed for housing, infrastructure needs, and commercial uses.

Population/Community Growth, Homesteading: Homesteading and community development began on the Arizona Strip and in the region in the 1850s. Mt. Trumbull, Little Tank, and other homesteading areas were founded from 1916-1930s. Over much of the region population gradually increased until the 1980s when population growth accelerated. With the last census in 2000, St. George, Utah became an urban area with more than 50,000 residents.

Tourism: With the creation of the national parks, monuments, and NRAs in the region, the increase in tourism has steadily risen over the past 100 years, with a dramatic increase in visitation since the 1970s. Local economies have gradually shifted from a reliance on extracting resources to economies based on the services industries and tourism

Transportation/Access: Wagon roads across the Arizona Strip began to be used in the 1850s. Some followed earlier American Indian trails. Regional roads, such as the Honeymoon Trail, connected the early communities of southern Utah and northern Arizona with communities in central and southern Arizona, northern Utah, southern California and Mexico. Construction of the Marble Canyon Bridge in 1928 provided more automobile access across the Arizona Strip. Construction of Interstate 15 through the Virgin River Gorge in the mid 1970's brought increasing traffic and visitors to this region.

Livestock Grazing: Livestock grazing of sheep and cattle and facilities and operations began on the Arizona Strip in the 1850s and increased dramatically during the 1880-90s. Current stocking rates, however, are much lower.

Drought: Occasional periods of drought occurred and affected pastures, crops, water tables levels, presence of water sources, and vegetation. Drought also raised the potential for wildfires. Between 1998-2004, most of the western U.S. experienced drought with the Arizona Strip experiencing extreme drought.

Wildland Fire: Fire management and fire history within the Planning Area have been affected by past actions that altered vegetation including logging, grazing, fire suppression efforts, and the spread of invasive vegetation. Euro-Americans began logging ponderosa pine during the 1870s at Mt. Trumbull. Logging accelerated with the creation of the Dixie National Forest in 1903 when Forest Service employees and contractors were hired to log areas and fight any fires that started at Mt. Trumbull, Mt. Logan, Mt. Dellenbaugh, and in the Parashant area. In the early 1930s, forest administration for the Mt. Trumbull/Mt. Logan unit was transferred to the Kaibab National Forest. The other Forest Service units in the Planning Area were taken out of Forest Service administration. In 1973, the Mt. Trumbull/Mt. Logan unit was transferred to BLM administration. Past fire suppression activities have resulted in dense or over-mature stands of pinyon-juniper, interior chaparral, sagebrush, and ponderosa pine. Dense, closed stands of ponderosa pine are at high risk of stand-replacing wildland fire. Fire suppression and past livestock grazing practices have altered grasslands through increased shrub densities and loss of perennial grasses. Exotic annual grasses have increased the number and size of fires, killing native vegetation and increasing the proliferation of exotic annual grasses. Thousands of acres of Mojave Desert shrub have been converted to steppe or grassland. The spread of tamarisk in riparian areas has dramatically increased flammable fuel loads. Between 1980 and 2003, a total of 178,804 acres were burned by wildfires in the Planning Area, which equals to an average of 85 wildland fire starts or 7,450 acres burned per year during that period.

Uranium Mining: Uranium exploration began in the 1950s on the Arizona Strip, but development and production didn't occur until the opening of six uranium mines in the 1980s. When the price of uranium fell later in the 1980s, production also fell and three of the mines were closed and reclaimed. Three mines remain on stand-by basis waiting for the price of uranium to rise.

Gypsum Mining: Commercial production of gypsum began in 1990 near Black Rock Gulch, south of St. George, Utah. Annual production in 2001 was approximately 700,000 tons. An additional gypsum mine in Cedar Pockets has also operated periodically during the past few years.

Grand Canyon Overflight Rules: Since the passage of the Overflights Act in 1987 which limited below-the-rim flights in the Grand Canyon, more private sightseeing flights north of the Grand Canyon occur over the southern portion of the Planning Area.

Present Actions

Federal Designations and Administration: The addition of two Monuments on the Arizona Strip (Parashant, and Vermilion) add to the acreage of regional land which protects open space and cultural and natural landscapes, is withdrawn from mineral entry, and remains under Federal administration.

Regional Population/Community Growth: Explosive population growth in Washington County, Utah, and Clark County, Nevada is rapidly changing the socioeconomic character of the region from a rural to an urban area.

Transportation/Access: See Reasonably Foreseeable Future Actions below.

Livestock Grazing: Approximately 3,151,580 acres are available for grazing in the Planning Area, with approximately 181,462 AUMs permitted. AMP implementation, watershed plans, and the Standards and Guides process allow for the examination of each allotment and implementation of measures to heal historical impacts to water, soil, and vegetative resources.

Drought: During FY2004 all permitted livestock grazing animals were removed from the Planning Area because of drought. In addition, six years of drought from 1998 to 2004 affected vegetation. Widespread mortality of pinyon-juniper and ponderosa trees is occurring throughout the Planning Area due to this drought.

Wildland Fire: See Reasonably Foreseeable Future Actions below.

Vegetation Treatments: See Reasonably Foreseeable Future Actions below.

Noxious Weeds (including invasive non-native grasses): See Reasonably foreseeable future actions below.

Gypsum Mining: Gypsum mining is presently occurring at the Domtar Ridge mine near Black Rock Gulch.

Grand Canyon Overflight Rules: See Reasonably Foreseeable Future Actions below.

Increasing demand for Non-motorized Recreation: See Reasonably Foreseeable Future Actions below

Reasonably Foreseeable Future Actions

Federal Designations and Administration: Completion of the Parashant, Vermilion, and Arizona Strip FO Management Plans; the Kanab RMP; and the Kanab and St. George BLM FO Travel Management Plans; Grand Canyon National Park Back Country Management Plan; and associated implementation plans would involve some further road closures in the region, which would protect open space and natural and cultural resources while restricting motorized access. Areas withdrawn from mineral entry in national monuments, national parks, NRAs, and wilderness areas would continue.

Regional Population/Community Growth: The explosive population growth in the region is one of the factors that could most influence the Planning Area in the long term. Washington and

Clark counties, both directly adjacent to the western portion of the Planning Area, are both poised to become major urban areas. St. George recently became an urban area during the last census and Mesquite, Nevada is one of the fastest growing communities in the country. The Lincoln County Land Act will provide more acreage for development and more population growth for Mesquite.

Developments include the new construction of the Southern Corridor four-lane highway from Milepost 2 on Interstate 15 to the new St. George Airport, which is projected to be completed by 2011. The Southern Corridor will eventually be connected to Hurricane, Utah and will provide more direct access to Zion National Park, Grand Canyon National Park, and Glen Canyon NRA. Development of the South Block Utah State Trust Lands would lead to development pressure on Arizona State Trust Lands directly south of St. George. It is reasonably foreseeable that Arizona State Trust Lands in this area of the St. George Basin could be developed during the life of this plan. The South Block Development just north of these lands in Utah is projected to eventually have a population of 25,000. It is not inconceivable that a similar community may develop due south in Arizona once water becomes available for development. This dramatic increase in population would affect the nature and use of public lands in the vicinity of St. George as well as increased use in the Monuments.

Similar population increases may also be expected in nearly all of the communities near the Planning Area such as the Mesquite/Beaver Dam/Littlefield area, the Kanab/Fredonia area, and in the Apple Valley/Colorado City/Hildale areas. Population in Washington County, Utah is projected to increase from 90,354 in 2000 to 251,896 by 2020. Kane County is expected to grow from 6,046 in 2000 to 8,359 in 2020. The twin cities of Colorado City, Arizona and Hildale, Utah are expected to grow from 5,229 in 2000 to 11,149 in 2020. (See Table 4.3 below and Socioeconomic section in Chapter 3 of this Plan.)

Table 4.3: Population of select towns/cities/counties in the Planning Area

Location	1990	2000	2010	2020	2030
Coconino County, AZ	96,591	116,320	147,352	169,343	189,868
Fredonia	1,207	1,036	1,507	1,671	1,811
Page	6,598	6,809	11,128	13,057	14,841
Mohave County, AZ	93,497	155,032	194,403	236,396	270,785
Colorado City	2,426	3,334	5,500	6,626	7,598
Kane County, UT	5,169	6,046	6,618	8,359	9,783
Kanab	3,289	3,564	3,825	4,831	5,654
Washington County, UT	48,560	90,354	162,544	251,896	353,922
St. George	28,502	49,663	85,144	132,497	185,809
Clark County, NV	741,459	1,375,765	1,827,770	--	--
Mesquite	1,871	9,389	21,000 ¹	--	--

Source: All 1990 and 2000 numbers, US Census Bureau; all Arizona projections, Arizona Dept. of Economic Security, Research Administration; all UT projections, Five County Association of Governments, St. George, UT; Nevada County Projections, Department of Cultural; Mesquite projections, City of Mesquite (¹2008 estimate)

Transportation/Access: Utah regional transportation projects, including the construction of a new interchange at milepost 2 of Interstate 15 just north of the Arizona/Utah border, would add to the cumulative impact to the Planning Area. The Southern Corridor would then be constructed east from this interchange. This would allow direct access off the River Road interchange and on to the Arizona Strip, increasing visitation and impacts to Parashant and the St. George Basin area of the Arizona Strip FO. Resulting development from this increased transportation network would result in an increase in population in the area, thus increasing impacts to resources in this area.

Livestock Grazing: Continuation of the Standards and Guides process would allow implementation of measures to continue to improve water, soil, and vegetation.

Drought: Future droughts are reasonably foreseeable in this region.

Wildland Fire: It is anticipated that over the next 20 years wildland fire would burn approximately 110,000 acres on the Planning Area, which is comparable to the acreage burned over the last 20 years (1984-2003). The number of acres burned would continue to vary greatly from year to year. Appropriate Management Response would be used for managing wildland fires based on firefighter and public safety, fire management allocations, criteria in the Fire Management Plan, and resource objectives.

Noxious Weeds (including invasive non-native grasses): BLM and NPS would continue to eradicate noxious weeds, implement actions to decrease their spread, and educate the public about noxious weed threats and prevention methods. Actions would be implemented to hinder the spread of invasive non-native grasses and foster healthy native and endemic species.

Uranium Mining/Exploration: The price of uranium is rising and is currently about \$20/ton. If the price continues to increase and reaches or exceeds \$25/ton, it is reasonably foreseeable that uranium mines may be re-opened in the near future, with the potential for further uranium exploration and development.

Gypsum Mining: The potential exists for additional open pit gypsum mines to be operating in the Cedar Pocket and Black Rock Gulch areas.

Land Tenure Adjustments: Future land exchanges may occur between BLM, NPS, and Arizona State Trust Lands in order to remove isolated parcels of the latter from BLM and NPS lands in the Monuments and wilderness areas and consolidate state trust lands for better future management. Depending on the location of Arizona State Trust Lands, there may be the potential to develop these lands into communities or extensions of existing communities. This could foster more development of now remote and undeveloped areas and place more pressure for use of these lands.

Lincoln County Land Act: The Lincoln County Land Act of 2000 will eventually transfer ownership of 13,500 acres of public land north and west of Mesquite, Nevada to private ownership by 2005. Development of this land would result in a considerable expansion of Mesquite. Assuming that development of all the acres would be at medium density of 7 housing units/acre and that a minimum of 2 individuals would occupy each housing unit, then an increased regional population of 189,000 people could occur in the coming years. Because it is directly adjacent to the Planning Area on the western edge of the Arizona Strip, this increased population would probably result in a dramatic increase in visitation and use of the Arizona Strip along with other public lands in the region.

Airport Expansions (St. George, Mesquite, Colorado City): Construction of the new St. George Airport in 2011 would increase air traffic, allow larger jets and planes to land, and provide for more commercial and economic development. It would eventually lead to more growth and urbanization which would translate into more use and pressure on federal lands in and surrounding the St. George Basin. The undeveloped open and scenic landscapes would become more valuable for recreation and property values. More and louder planes may affect soundscapes for approach areas near the airport. Within 40 miles of this proposed airport are the Beaver Dam, Paiute, and Cottonwood Points wilderness areas, the northern one-third of Parashant, Little Black Mountain ACEC/Public Use Site, and a portion of the Old Spanish NHT. These areas could also be impacted.

Similar to the expansion of the St. George Airport, construction of the Mesquite Airport approximately 30 miles northwest of Parashant would affect that Monument and the western portion of the Arizona Strip FO by allowing for more commercial and economic development in the area, increasing population growth, and adding more use and pressures on the federal lands. Within 40 miles of this proposed airport are the Beaver Dam, Paiute, and Grand Wash Cliffs wilderness areas, a portion of the Old Spanish NHT, and Little Black Mountain ACEC/Public Use Site, all of which could be impacted.

Expansion of the Colorado City Airport would also allow more commercial and economic development and population growth in this area, but the use of this airport would probably be restricted to local traffic rather than the commercial traffic expected at the St. George and Mesquite airports. Within 40 miles of this airport are the Cottonwood Points, Beaver Dam, Mt. Trumbull, and Kanab Creek wilderness areas, and Little Black Mountain ACEC/Public Use Site, all of which could be impacted.

The cumulative effect of the construction and/or expansion of all three of these airports in this region would have a dramatic effect on the growth of the communities and the increased use and values of the surrounding public lands.

Lake Powell Water Pipeline ROW: A 120-125 mile pipeline to bring water from Lake Powell water to Sand Hollow Reservoir in the St. George Basin may be constructed about 2020 or near the end of the life of this plan. The pipeline may have a capacity to deliver 80,000 acre feet per

year. Current plans are for the pipeline ROW to follow existing highways and/or ROW corridors through Utah and Arizona. Construction of the pipeline and subsequent use of the water would allow further development, and thus more use of the federal lands in the area.

Retirement: Increasing OHV use, day use, recreational driving, and recreation would increase with the baby boom generation retirement looming on the horizon. A dramatic increase in the number of retired individuals would occur in the near future. The retirement communities of Mesquite, St. George, and Kanab may increase in population and obtain a higher ratio of the retirement population. The result may be an increase in public land recreational use. With the increase in OHV registration over the past seven years, an expectant increase in OHV use may be expected in the entire region. (See Table 4.4 for information on OHV registration growth over a six year period in Utah).

Table 4.4: OHV Registration in Utah

Location	1998	2004	% Change
Kane County	306	1,167	113%
Washington County	1,654	7,876	316%

Source: Utah BLM

All of these projects, uses, and actions, when combined with each of the management alternatives, would result in cumulative impacts to various resources and resource uses in the Planning Area. Some cumulative impacts to the communities and the environment are directly related to local and regional growth. None of the alternatives would have a significant effect on regional growth and the effects of any alternative on local population growth are negligible. A summary of the probable cumulative impacts, by alternative, is presented below.

Alternative A: No Action

In the No Action Alternative, population growth north and west of the Planning Area would continue to contribute to cumulative impacts. Effects from regional transportation projects could increase visitor use and community development, particularly in the St. George Basin and near Mesquite. Increased mining of gypsum and/or uranium could affect resources in Arizona Strip FO.

Land tenure adjustments with the Arizona State Land Department could benefit management for both federal and state land but could also encourage increasing population growth and community development, depending on where the consolidated state lands remain. The Lincoln County Land Act would result in an expansion of the community of Mesquite and increasing population and contribute to additional use of public lands. Development of the South Block near St. George would result in a new community of approximately 25,000 individuals directly north of the Arizona Strip FO. It would also result in increasing demand for and value of resources in the Arizona Strip FO and Parashant. Potential development of the block of Arizona

state land south of St. George would have the same effects, as would airport expansions in the region, both of which would allow for increased population growth in the region.

Construction of the Lake Powell Pipeline would also allow for further community growth and development in the region.

Alternative B

Impacts from increased community developments and population growth mentioned under Alternative A would also apply to Alternative B. However, closing more roads to motorized traffic under Alternative B would provide more protection of open space and natural and cultural resources from increasing visitation and use of BLM and NPS lands that would result from increased population growth in the region. Effects from regional transportation projects would also be similar to Alternative A with the exception that concentration of use may occur in some areas due to the number of road closures and restrictions proposed under Alternative B.

Cumulative Impacts from land tenure adjustments and construction of the Lake Powell Pipeline would be the same as discussed under Alternative A.

Alternatives C, D, E

Cumulative impacts under Alternatives C, D, and E would be similar to those discussed under Alternative A.

Alternatives C, D, and E are designed to keep most of the landscape in its present condition or to return it to its natural range of variability, particularly in the Monuments and present roadless areas. Little development is expected on BLM or NPS lands within the Planning Area. Overall impacts of these alternatives are minor. Impacts to local government revenues and expenditures are also relatively minor.

MITIGATION MEASURES

Mitigation of potential impacts not already built into the alternatives is discussed below and in various sections of this document. Mitigation measures that have been developed are in the form of standard operating procedures, which apply to all alternatives and have already been assessed in discussion of impacts in this chapter. Mitigation measures can be found in Appendix 2.E (Conservation Measures for Special Status Species) and Appendix 2.N (Reclamation Stipulations). Additionally, the Standards for Rangeland Health would continue to require monitoring and application of remedies in allotments across the Planning Area to meet Land Health Standards (see Appendices 2.E and 2.H).

Monitoring would be an integral part of restoration plan development, recreation management, and adaptive management.

Most of the management direction presented in this Draft Plan/DEIS is at the programmatic level, making it difficult to develop specific mitigation measures. NEPA analysis documents would be prepared for specific projects and mitigation would be part of the NEPA compliance process.

NPS IMPAIRMENT ANALYSIS

Archaeological and Historic Resources

Impairment of archaeological and historic resources in the NPS portion of Parashant could be expected in any case where the impacts of specific management actions are classed as *major*, pursuant to the definitions offered in the Impacts to Cultural Resources section. In these cases, the NRHP eligibility of these sites would be lost due to changes to one or more character-defining features of the resource coupled with diminished integrity of the resource.

Under some of the actions in Alternatives B, D, and E major impacts on archaeological and historic resources could result from Vegetation Management in the Riparian, Great Basin, and Ponderosa Pine ecological zones, Recreation, Minerals, and Lands and Realty decisions proposed under those Alternatives. In all cases where major impacts to archaeological and historic resources would be caused by particular management programs, impairment of these resources could be avoided through either avoidance or other acceptable mitigation means (e.g. data recovery) defined under Section 106 of the NHPA. In fact, the cultural resource management process specified in 36 CFR 800 would be required in cases where any Federal undertaking would have adverse effects on NRHP-eligible resources.

Resources of Importance to American Indians

Much like archaeological and historic resources, impairment of American Indian resources in the NPS portion of Parashant could be expected in any case where the impacts of specific management actions are classed as *major*, pursuant to the definitions offered in the Impacts to Cultural Resources section. In these cases, the NRHP eligibility of these sites would be lost due to changes to one or more character-defining features of the ethnographic resource or traditional use area. The action would also diminish the integrity of the resource to the extent that it no longer would be able to sustain traditional or sacred uses. Further, the action under a particular resource management plan might close off access to sacred or traditional use areas. In any case, a major impact would result in an adverse effect on the resource under 36 CFR 800.

Vegetation management practices could produce major impacts on American Indian resources under Alternatives B, C, D, and E. Under Alternative D, larger acreages proposed for vegetation treatment would create greater ground disturbance and thus would create potentially major impacts on TCPs considered important to American Indians. Major impacts from vegetation management practices provided under Alternative E would be limited to the Great Basin and

Ponderosa Pine ecological zones. Major impacts on resources important to American Indians resulting from the recreation management program proposed under Alternative D would be limited to specific areas within the NPS portion of Parashant.

Avoidance of American Indian sacred sites and traditional use areas is the only real means of preventing impairment of these resources. Meaningful tribal consultation may result in sufficient identification of these resources so that they could be avoided during vegetation management efforts under the preferred alternative. Indeed, the key to avoiding impairment of American Indian resources under any of the proposed alternatives is successful and ongoing consultation with the federally recognized Tribes traditionally affiliated with the NPS portion of Parashant.

Natural Resources

Impacts to natural resources were reviewed for their potential to lead to impairment. Following the *Interim* Technical Guidance on Assessing Impacts and Impairment to Natural Resources (NPS Natural Resource Program Center, July 2003), the five alternatives were assessed at three levels: magnitude of the action, probability of a wrong decision, and consequences of the action.

Based on the information provided in the Draft Plan/DEIS, both Alternatives C and E do not contain actions that would have major impacts on the identified resources of the NPS portion of Parashant; they would not, therefore, lead to impairment. Unavoidable adverse impacts are limited in scope and duration and would not permanently alter the character of the NPS portion of Parashant. Alternatives A, B, and D have identified actions that may lead to major impacts. If major impacts can be avoided or mitigated so that the resources would neither require an excessively long recovery (e.g., multiple generations) nor be unrecoverable altogether, then these management actions would not lead to resource impairment.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are impacts that remain following the implementation of mitigation measures, or impacts for which there are no mitigation measures. Some unavoidable adverse impacts occur as a result of proposed management under one or more of the alternatives, while others are a result of public use of the BLM and NPS lands in the Planning Area. For example, restoration would be the primary cause of unavoidable adverse impacts from management actions, while public uses such as livestock grazing, mineral development, and OHV use would be the primary causes of unavoidable adverse impacts by the public. Potential unavoidable adverse impacts are difficult to quantify and could extend beyond the planning period. The following sections discuss those unavoidable adverse impacts that have been identified for the proposed management direction in the Planning Area. If an impact topic is not mentioned, no important unavoidable adverse impacts to that resource or resource use were determined.

Air Quality: Smoke generated from wildfires, managed natural fires, and prescribed burns would be unavoidable, but impacts would be short term.

Water Resources: Vegetation treatments could increase sedimentation to surface waters. This impact is expected to be short term until new vegetation stabilizes the treated areas.

Soils: Vegetation treatments could increase soil erosion. This impact is expected to be short term until new vegetation stabilizes treated areas. Authorized and unauthorized OHV use would continue to be a concern as it relates to rutting, compaction, and soil erosion.

Fish and Wildlife: Vegetation treatment, particularly managed/prescribed fire and mechanical tools and techniques, could increase sedimentation in surface waters and reduce certain types of wildlife habitat. These impacts are expected to be short term until new vegetation stabilizes treated areas, and restored areas would provide better habitat for fish and wildlife in the long term. OHV use could also disturb sensitive wildlife.

Cultural Resources: OHV use and vandalism of sites would continue to adversely impact cultural resources. Natural erosion and weathering would continue to degrade cultural resources.

Visual Resources: Wildlife and vegetation treatments, particularly managed/prescribed fire and mechanical tools and techniques, would change the visual character of those areas affected. Pinyon-juniper and ponderosa pine woodlands would experience the most noticeable changes. Treated areas may display reduced or unnoticeable visual contrast once vegetation has become reestablished, or they may show signs of human intervention for decades following treatment. Mineral exploration and development in Arizona Strip FO would cause adverse but localized impacts to visual resources. Unauthorized, cross-country, OHV travel could create linear scarring of the landscape.

Recreation: Vegetation treatments and mineral exploration and development activities would displace recreation during their active periods. Once restoration is established and development areas are reclaimed, visitors could return to these areas. Changes in the amount and patterns of OHV use could result in increased conflicts between users and unanticipated changes in recreation resource conditions.

Livestock Grazing: Vegetation treatments would modify range conditions, temporarily reducing forage, and would require restricting livestock from treated areas until vegetation becomes sufficiently established to withstand grazing. In the long term, restored areas would provide improved forage for livestock.

American Indian Traditional Uses: Native plants important to American Indians would be disturbed by vegetation treatments until restoration is completed. In the long term, vegetation restoration would provide greater sustainability and populations of native plants, such as native tobacco, or more viable and productive natural vegetation.

RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

Under all alternatives, the short-term disturbances of soil, vegetation, and wildlife habitats from restoration efforts throughout the Planning Area and in specific locations such as Pakoon Spring would be more than offset by the long-term productivity of restored riparian, grassland, sagebrush, pinyon/juniper, and ponderosa pine habitats. This would be particularly true under Alternative E due to its greater emphasis on long-term restoration of habitats, including the Pakoon and Cane springs areas.

Also under all alternatives, grazing across the Planning Area and mineral extraction in the Arizona Strip FO would constitute short-term uses of the environment in various locations. Short-term grazing uses would be balanced by the long-term productivity of livestock industries. The disturbance of soils, vegetation, and wildlife habitats from minerals exploration and extraction and livestock grazing, as well as from recreation use, would reduce the long-term productivity of the environment in local areas where revegetation or restoration of the natural environment could not be fully realized over time.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The implementation of actions in accordance with the preferred alternative (Alternative E) may result in impacts that might be considered irreversible and irretrievable. Irreversible commitment of resources refers to the loss of future options and applies primarily to the effects of the use of nonrenewable resources, such as minerals, cultural resources, soils. An irretrievable commitment of resources involves the loss of production, harvest, or use of natural resources over a period of time. For example, livestock forage production may be lost in an area that is undergoing restoration or was subject to a wildfire. The production lost is irretrievable, but the action is not irreversible. Once the area is restored, forage production would increase and livestock grazing could resume.

Implementing the alternatives would result in some, small-scale disruption to resources, some of which may become long term or permanent. Potential irreversible or irretrievable losses are described below.

Loss of soils from erosion during restoration treatments or following wildfires would be irretrievable. Changes in vegetation communities from wildfire, cheatgrass invasion, or restoration treatments may not be reversible, or may be reversible after many decades. Vegetation production lost to drought, wildfire, restoration treatments, and invasive plants would be irretrievable. Changes in vegetation communities that would result from restoring or not restoring areas may not be reversible or may be reversible only after many decades. Invasion by cheatgrass and other noxious or invasive weeds may be irreversible. The resources committed to manage weeds would be irretrievable.

The effects of a high intensity wildfire or one covering large acreage would be reversible only after several decades. Resources committed for fire suppression and rehabilitation would be irretrievable.

Changes in wildlife habitat from wildfire, invasive plants, or restoration treatments may not be reversible or may be reversible only after many decades. Effects to special status animals from authorized and unauthorized activities, wildfire, invasive plants, or restoration treatments may not be reversible. Effects to special status plants from authorized and unauthorized activities, wildfire, invasive plants, or restoration treatments may be reversible.

Authorized mitigation of cultural sites prior to disturbance and unauthorized collecting and vandalism would result in an irreversible commitment of the resource. Authorized and unauthorized collection of fossils would result in an irreversible commitment of the resource.

Opportunities to view undisturbed settings lost during restoration treatments or mineral activities would be irretrievable. Scaring of the landscape resulting from authorized and unauthorized OHV use can be irreversible.

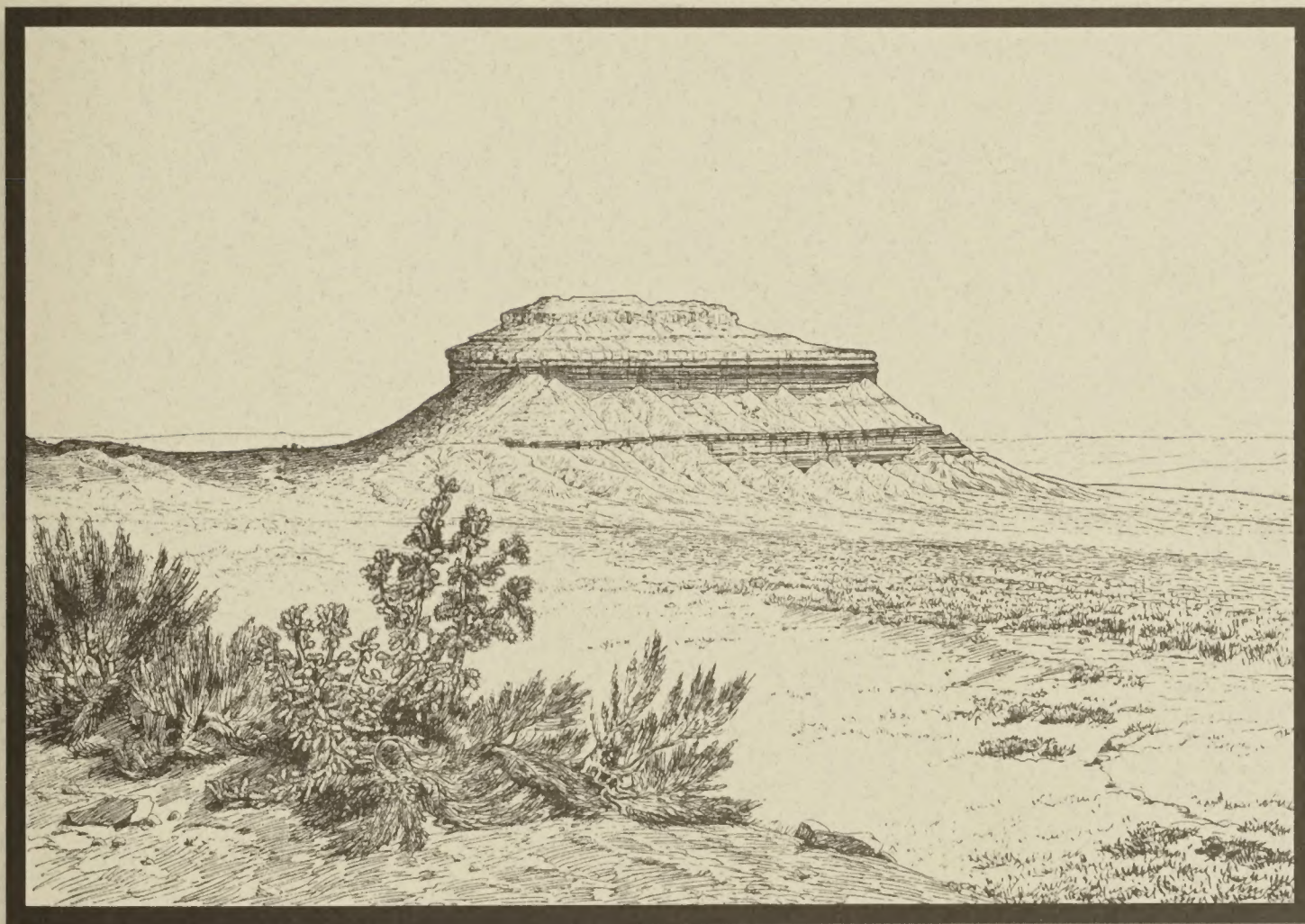
Disposal of public lands would be irreversible. Disposal of public land to facilitate economic development of the communities and counties within the Arizona Strip FO would be irreversible. Authorized activities that make lands unsuitable for disposal would be minimal.

Invasion of rangelands by cheatgrass or other invasive plants may be irreversible. Loss of forage production during watershed restoration would be irretrievable.

Production of oil and gas would be an irreversible use of the resource. Closing an area to leasing would constitute an irretrievable commitment of potential resources. Mining of locatable minerals would be an irreversible use of the resource. Mining of saleable minerals (sand and gravel, for example) would be an irreversible use of the resource. Denial of the sale of mineral materials would constitute an irretrievable commitment of the resources.

Chapter 5

Consultation and Coordination



“The land will be here a lot longer than us.”

Evening on the Arizona Strip 2003
Lyman Hafen

CHAPTER 5: CONSULTATION AND COORDINATION

COMMUNICATION METHODS

The Planning Area is a special place to many people. In order to ensure that agencies, communities, organizations, tribes, groups, and interested individuals affected by the planning decisions were informed and had the opportunity to be involved, the planning process remained open and inclusive, as much as possible. One of the internal goals of the planning effort was to have “no surprises.” Verbal and written comments received during planning and public scoping improved the quality of this Draft Plan/Draft Environment Impact Statement (DEIS).

The following internal guidelines were followed during the planning process:

- 1) Public comments were accepted throughout the planning effort.
- 2) All requests for information were granted, unless the information was unavailable or prohibited by policy or law.
- 3) Staff and managers met with any group or individual requesting such a meeting.
- 4) Internal processes, such as the Route Evaluation Tree[®], were open to review and assistance by the Cooperating Agencies; comments were invited.
- 5) Staff and managers took planning information to all meetings, such as Grazing Advisory Board, Federal Managers, Resource Advisory Council, and Tribal Council meetings.

The following communication methods were used to keep everyone informed on planning progress:

- Community Based Partnership and Stewardship workshops
- Formal presentations to American Indian tribal, band, and chapter councils
- EIS public scoping process
- Planning bulletins
- Bureau of Land Management (BLM) and National Park Service (NPS) web pages
- Informal presentations to interested groups
- Cooperating Agencies

COMMUNITY BASED WORKSHOPS AND COLLABORATIVE PLANNING

Before the Notice of Intent (NOI) was published in the Federal Register, community based workshops were held in and near the Planning Area with the assistance of the Partnership Series and James Kent Associates (JKA). Members of communities in and near the Planning Area were invited to participate, with over one hundred people having attended. Table 5.1 provides the dates and locations of the workshops. The goals of these workshops were to:

- 1) Gather information regarding the future of the Planning Area from the local communities, agencies, groups, and individuals.
- 2) Inform about the upcoming planning effort.
- 3) Encourage the initiation of community based planning groups on the Arizona Strip.
- 4) Encourage active participation and involvement in future planning on the Arizona Strip.

Table 5.1: Community Based Workshops

Event	Dates	Location
Community-Based Partnership*	May 19-21, 2001	St. George, Utah
Community-Based Partnership*	January 31-February 1, 2002	Kaibab Village, Arizona
Community-Based Partnership*	March 2002	St. George, Utah
Community-Based Stewardship**	November 30-December 1, 2002	St. George, Utah
Community-Based Stewardship**	February 22-23, 2002	Page, Arizona
* Offered by the Partnership Series, Community-Based Partnerships and Ecosystems: Ensuring A Healthy Environment, a 3-day workshop.		
** Offered by JKA, a 12-hour workshop,		

JKA also worked with BLM and NPS staff on the Community Discovery process out of St. George, Utah, in October 2001 for the western half of the Planning Area and out of Kanab, Utah, in December 2001 for the eastern half of the Planning Area. Informal interviews were conducted with people living in communities in and adjacent to the Planning Area. The purpose of such interviews was to gather the concerns of those living in or near the Planning Area relating to public lands and its future management.

Some of the main lessons learned from these workshops are as follows:

- 1) People were concerned about public lands but did not attend public meetings unless they were already negatively impacted by land management decision(s).
- 2) The Planning Area is too large a geographic area to have a single community.
- 3) The public perception that “the government is going to do what it wants to do anyway” kept many people away from workshops.

FORMAL PRESENTATIONS TO AMERICAN INDIAN TRIBAL, BAND, AND CHAPTER COUNCILS

Before and after the NOI was published and in accordance with the National Environmental Policy Act, the National Historic Preservation Act, and Executive Order 13007, meetings were held with American Indian tribal, band, and chapter councils and members. The goal of these meetings was to inform and solicit input for the planning process from all American Indians living on or near the Arizona Strip, or having cultural or ancestral ties to those who are presently living or once lived in the Planning Area. Table 5.2 lists those meetings.

Table 5.2: Meetings with American Indian Tribes, Bands, and Councils

Date	Tribe, Band, or Council	Meeting Location
2001		
August	Paiute Tribe of Utah General Council	Cedar City, Utah
August 30	Hopi Cultural Resources Advisory Task Team	Second Mesa, Arizona
2002		
January 9	Shivwits Band Council	Shivwits, Utah
February 20	Hopi Cultural Preservation Office	Kykotsmovi, Arizona
February 21	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
March 12	Moapa Paiute Tribe	Moapa, Nevada
April 12	Hualapai Tribal Council	Peach Springs, Arizona
May 14	Kanosh Band	Kanosh, Utah
May 15	Cedar Band	Cedar City, Utah
May 28	Koosharem Band	Cedar City, Utah
July 22	Hualapai Public Scoping	Peach Springs, Arizona.
October 17	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
December 3	Hopi Tribe	Kykotsmovi, Arizona
2003		
February 5	Las Vegas Paiute Tribe	Las Vegas, Nevada
February 5	Las Vegas Indian Center	Las Vegas, Nevada
March 19	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
September 17	Southern Paiute Tribal Chairpersons Association	Pipe Springs, Arizona
September 18	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
October 14	Moapa Paiute Tribe	Moapa, Nevada
October 14	Navajo Nation-Cameron Chapter	Cameron, Arizona
October 22	Navajo Nation-Tuba City Chapter	St. George, Utah
October 23	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
2004		
January 22	Kanosh Band of the PITU	Cedar City, Utah
February 6	Kaibab Paiute Cultural Resources	Fredonia, Arizona
February 13	PITU Cultural Resources	St. George, Utah
March 30	San Juan Southern Paiute	Hidden Springs, Arizona
September 16	Las Vegas Paiute Tribe	Las Vegas, Nevada
October 2	Kaibab Paiute Tribe Annual Meeting	Kaibab Village, Arizona
October 26	Southern Paiute Tribal Chairpersons Association	St. George, Utah
2005		
May 19	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona

PLANNING BULLETINS

Planning bulletins were sent to interested individuals and groups, affected state and federal agencies, communities, and tribes to inform about planning issues and progress and to invite comment. Individuals and groups with email addresses received notice that the planning bulletin was available on the web sites. Table 5.3 lists the planning bulletins that were placed on the BLM and NPS websites and sent to those who requested copies;

Date Released	Contents
May 2002	Scoping meetings locations and dates, Planning Worksheet
December 2002	Planning Issues, Results of scoping, Draft of Purpose, Significance, Mission Statements and Planning Criteria
April 2003	Route Evaluation Tree, Wilderness, EcoZones information, Preliminary alternative meetings locations and dates
May 2003	Preliminary Alternatives, meeting locations and dates
October 2003	Results of preliminary alternative meetings, wilderness changes
August 2004	Draft Plan/DEIS Availability
September 2005	Notice of Availability, Draft Plan/DEIS public meeting locations and dates

PUBLIC SCOPING MEETINGS

The NOI initiating planning was published in the Federal Register on April 24, 2002 (See Appendix 1.F for the NOI and Appendix 1.C for more information on the public meetings and the results of public scoping).

The NPS and BLM held 11 open houses in 2002 to encourage public input and to define the planning issues for this Draft Plan/DEIS. Based on the resultant public input, the BLM and NPS, with assistance from the Cooperating Agencies, developed five conceptual alternatives that were presented to the public via planning bulletins and five open houses in 2003. Information from these meetings, the Cooperating Agencies, interested state and Federal agencies, and the public was then used to develop this Draft Plan/DEIS.

BLM AND NPS WEB PAGES

Planning information, including schedule, meeting locations and dates, planning bulletins, scoping report, associated maps, and a copy of this Draft Plan/DEIS was posted on the BLM website (http://www.az.blm.gov/LUP/strip/strip_plan.htm) and on the NPS website (<http://www.nps.gov/para>).

COOPERATING AGENCIES

Ten Cooperating Agencies worked with the BLM and NPS and provided verbal and/or written comments during planning which helped to develop this Draft Plan/DEIS. The Cooperating Agencies also provided planning information on various planning topics, including GIS data layers and information. The following counties, communities, tribe, and state agencies signed Memoranda of Understanding to be Cooperating Agencies with BLM and NPS for this planning effort:

- Coconino County, Arizona
- Mohave County, Arizona
- Kane County, Utah
- Washington County, Utah
- Fredonia, Arizona
- Colorado City, Arizona
- Kaibab Paiute Tribe
- Arizona Game and Fish Department (AGFD)
- U.S. Federal Highway Administration
- Arizona Department of Transportation

In addition, representatives from other interested federal and state agencies and one tribe were provided planning information and given the opportunity to comment on preliminary drafts of the Draft Plan/DEIS. Some attended the Cooperating Agency meetings and provided verbal and/or written comments. These entities were as follows:

- Arizona State Land Department
- NPS: Grand Canyon National Park, Glen Canyon National Recreation Area (NRA), Pipe Spring National Monument
- BLM: Kanab Field Office, Grand Staircase-Escalante National Monument, St. George Field Office, Las Vegas Field Office
- Department of Defense, Air Force Regional Environmental Office, San Francisco, California
- US Fish and Wildlife Service (USFWS), Arizona Ecological Services Field Office, Flagstaff and Phoenix, Arizona
- US Forest Service (USFS); North Kaibab Ranger District, Kaibab National Forest

Partnership with Lake Mead NRA

As directed by the Proclamation 7265, Lake Mead NRA co-manages the Parashant with the BLM. Throughout the planning effort, NPS Parashant and Lake Mead staff provided information and worked with BLM on this Draft Plan/DEIS.

Other Groups

Various other groups also played a vital role in the planning process. Their participation was informal and infrequent. One of these groups, the Arizona Strip Alliance, was formed in the late 1990s in response to the early discussions regarding the establishment of monuments on the Arizona Strip. Local communities, counties, and agency representatives from southern Utah and northern Arizona united in order to plan on a regional scale. BLM and NPS employees from the Arizona Strip planning Team attend Alliance meetings and keep members up-to-date on current planning efforts.

The Arizona Wilderness Coalition is another group that played an important role in the planning process. It is comprised of the Grand Canyon Chapter of the Sierra Club, Wilderness Society, Grand Canyon Wildlands Council, and Grand Canyon Trust. Their major contributions included public scoping comments recommending a transportation plan, additional wilderness study areas, and additional areas of critical environmental concern (ACECs); information on the effects of transportation systems on wildlife; and other planning information.

In order to address the specific needs of wildlife, fish, and special status plants and animals, a group of biologists and botanists met to develop specific guidance and direction to meet those needs for this Plan. Team participants included staff from the AGFD, USFWS, Lake Mead NRA, North Kaibab Ranger District of the USFS, and Arizona Strip BLM. On occasion, representatives from the Nature Conservancy and the Grand Canyon Wildlands Council also participated. Major contributions from this team included the development of a comprehensive resource assessment for wildlife and special status species, background information on the biology of a variety of species affected by the plan, and a set of proactive decisions appropriate to each of the alternatives. The team also provided comments and recommendations on the transportation plan, route designations, ACECs, vegetation management, and other sections of the plan.

Public involvement in planning for the Arizona Strip is ongoing. Hopefully, the many individuals, agencies, and organizations who helped draft this Draft Plan/DEIS will continue to assist in protecting and using the special places in the Planning Area. There will continue to be many opportunities for public involvement. Planning is merely the beginning of fruitful collaboration and communication that translates into healthy landscapes and continuing opportunities to use and appreciate the resources in a wide variety of ways.

ARIZONA STRIP DRAFT PLAN/DEIS DISTRIBUTION LIST

Federal Agencies

Bureau of Indian Affairs:

Phoenix, AZ
St. George, UT

Bureau of Land Management:

Ely Field Office
Grand Staircase-Escalante NM
Kanab Field Office
Las Vegas Field Office
St. George Field Office
Cedar City Field Office
Arizona State Office
Nevada State Office
Utah State Office

Federal Highway Administration

Phoenix, AZ

Department of Transportation, Washington, D.C.

National Park Service:

Lake Mead NRA
Glen Canyon NRA
Grand Canyon National Park
Grand Canyon National Park, Tuweep
Great Basin National Park
Pipe Springs National Monument
Pacific West Region

Department of Defense, AFRCE, San Francisco, CA

Environment and Safety, Pentagon, Washington, D.C.

Bureau of Reclamation, Page, AZ

Minerals Management Service, Denver, CO

Natural Resources Conservation District, Fredonia, AZ

U.S. Bureau of Mines, Denver, CO

U.S.D.A. APHIS Wildlife Services

U.S. Environmental Protection Agency

Denver, CO and Washington, D.C.

U.S. Department of Defense

Air Force Regional Environmental Office, San Francisco, CA

U.S. Fish and Wildlife Service

Flagstaff, AZ
Phoenix, AZ

U.S. Forest Service

North Kaibab Ranger District, Fredonia, AZ
Kaibab Ranger District, Williams, AZ
Coconino National Forest, Flagstaff, AZ
Dixie National Forest, St. George and Cedar City, UT
Leopold Institute, Missoula, MT

U.S. Geological Survey, Flagstaff, AZ, Moab, UT and Reston, VA

State Agencies and Organizations

Arizona Department of Agriculture
 Arizona Department of Commerce
 Arizona Department of Environmental Quality
 Arizona State Historic Preservation Office
 Arizona Department of Mines and Mineral Resources
 Arizona Department of Transportation, Phoenix and Kingman, AZ
 Arizona Game and Fish Department, Phoenix, Kingman, and Flagstaff, AZ; St. George, UT
 Arizona Geological Survey, Tucson, AZ
 Arizona Historical Society
 Arizona State Historic Preservation Office
 Arizona State Land Department
 Arizona State Parks
 Northern Arizona Governor's Office
 Coconino County, AZ
 Mohave County, AZ
 Kane County, UT
 Washington County, UT
 Clark County, NV
 Washington County Water Conservancy District, UT
 Washington County School Superintendent, St. George, UT
 Washington County Planning Department, St. George, UT
 Five County Association of Governments, UT
 Clark County Desert Conservation Program, NV
 Nevada Division of Environmental Protection, Carson City, NV
 Southern Nevada Water Authority
 Mohave County Public Land Use Committee
 Mohave County Cooperative Extension, Kingman, AZ
 Red Cliffs Desert Reserve, UT
 Northern Arizona University School of Forestry, Flagstaff, AZ
 Utah Department of Transportation, Cedar City and Salt Lake City, UT
 Utah Department of Agriculture, Salt Lake City, UT
 Utah Environmental Congress, Salt Lake City, UT
 Utah Division of Wildlife Resources, Salt Lake City, UT
 Utah Governor's Office of Planning and Budget, Salt Lake City, UT
 Western Arizona Council of Governments, Yuma and Kingman, AZ

Local Governments

Colorado City, AZ
 Fredonia, AZ
 Littlefield, AZ
 RIPPLE (Littlefield, Scenic, Beaver Dam communities)
 Page, AZ
 Page-Lake Powell Chamber of Commerce
 Big Water, UT
 Hildale, UT
 Hurricane, UT
 Hurricane Chamber of Commerce
 Kanab, UT

St. George, UT
Five County Association of Governments, St. George, UT
Beaver Dam, NV
Boulder City, NV
Bunkerville, NV
Mesquite, NV
Las Vegas Valley Water District

Tribal Governments

Chemehuevi Indian Tribe
Colorado River Indian Tribe
Havasupai Tribe
Hopi Tribe
Hualapai Tribe
Kaibab Band of Paiutes
Las Vegas Paiute Tribe
Moapa Band of Paiutes
Navajo Nation
 Bodaway/Gap Navajo Chapter
 Cameron Navajo Chapter
 Coalmine Navajo Chapter
 Coppermine Navajo Chapter
 LeChee Navajo Chapter
 Tuba City Navajo Chapter
Pahrump Band of Paiutes
Paiute Tribe of Utah
Pueblo of Zuni
San Juan Southern Paiute Tribe
Shivwits Band of Paiutes

Congressionals

Senator Jon Kyl, Arizona
Senator John McCain, Arizona
Senator Robert Bennett, Utah
Senator Orrin Hatch, Utah
Senator Harry Reid, Nevada
Senator John Ensign, Nevada
Representative Trent Franks, Arizona
Representative Rick Renzi, Arizona
Representative Jim Matheson, Utah
Representative Shelley Berkley, Nevada

Non-governmental Organizations and Businesses

Apex Minerals, Holladay, UT
Arizona Wilderness Coalition, Alpine, AZ
Arizona Wildlife Outfitters, Kingman, AZ
Blue Ribbon Coalition, Pocatello, ID
Center for Biological Diversity, Phoenix and Tucson, AZ
Permits West, Inc., Santa Fe, NM
AZ Desert Bighorn Sheep Society
Desert Tortoise Council
Ecological Restoration Institute, NAU, Flagstaff, AZ
Environmental Defense Fund of Nevada, Las Vegas, NV
Friends of Grand Canyon, Mayer, AZ
Forest Guardians
Forestry Association, Glenwood, NM
Grand Canyon River Outfitters Association
Grand Canyon Trust, Moab and Flagstaff
Grand Canyon Wildlands Council, Flagstaff, AZ
International Society for the Protection of Mustangs and Burros
Jacob Lake Inn, Fredonia, AZ
Land and Water Fund of the Rockies, Boulder, CO
Mohave County Extension Agent, Kingman, AZ
National Trust for Historic Preservation, Washington, D.C.
National Wildlife Federation, Reston, VA, Boulder, CO, Washington, D.C.
Natural Resources Defense Council, San Francisco, CA and New York, NY
Partners in Conservation
Public Lands Interpretive Association, Phoenix, AZ
Qwest Communications, Tempe, AZ
Red Cliffs Audubon Society, St. George, UT
Riverside Ruff Riders, Riverside, CA
Safari Club International, Flagstaff and Tucson, AZ
Sierra Club, Flagstaff and Phoenix, AZ, San Francisco, CA, Washington, D.C.
Silver Arrow Stone Co., Fredonia, AZ
The Sonoran Institute, Bozeman, MT
Southern Nevada Water Authority, Las Vegas, NV
Southern Utah Climbers Association, St. George, UT
Southern Utah Wilderness Alliance, Salt Lake City, UT
Southwest Regional Conservation Committee, Tucson, AZ
Southwest Resources Council, Hurricane, UT
Sportsmen for Fish and Wildlife, South Weber, UT
SWCA, Inc., Tucson, AZ
The Nature Conservancy, Tucson and Flagstaff, AZ and Las Vegas, NV
The Wilderness Society, Denver, CO and Washington D.C.
Trust for Public Lands, Washington, D.C.
Utah Rural Development Council, Cedar City, UT
Western Resource Advocates, Salt Lake City, UT
Western Watershed Project, Southern Utah, Boulder, UT
Wild Utah Project, Salt Lake City, UT
Wilderness Watch, Missoula, MT
Wildlife Society, Bethesda, MD
Yuma Audubon Society, Yuma, AZ

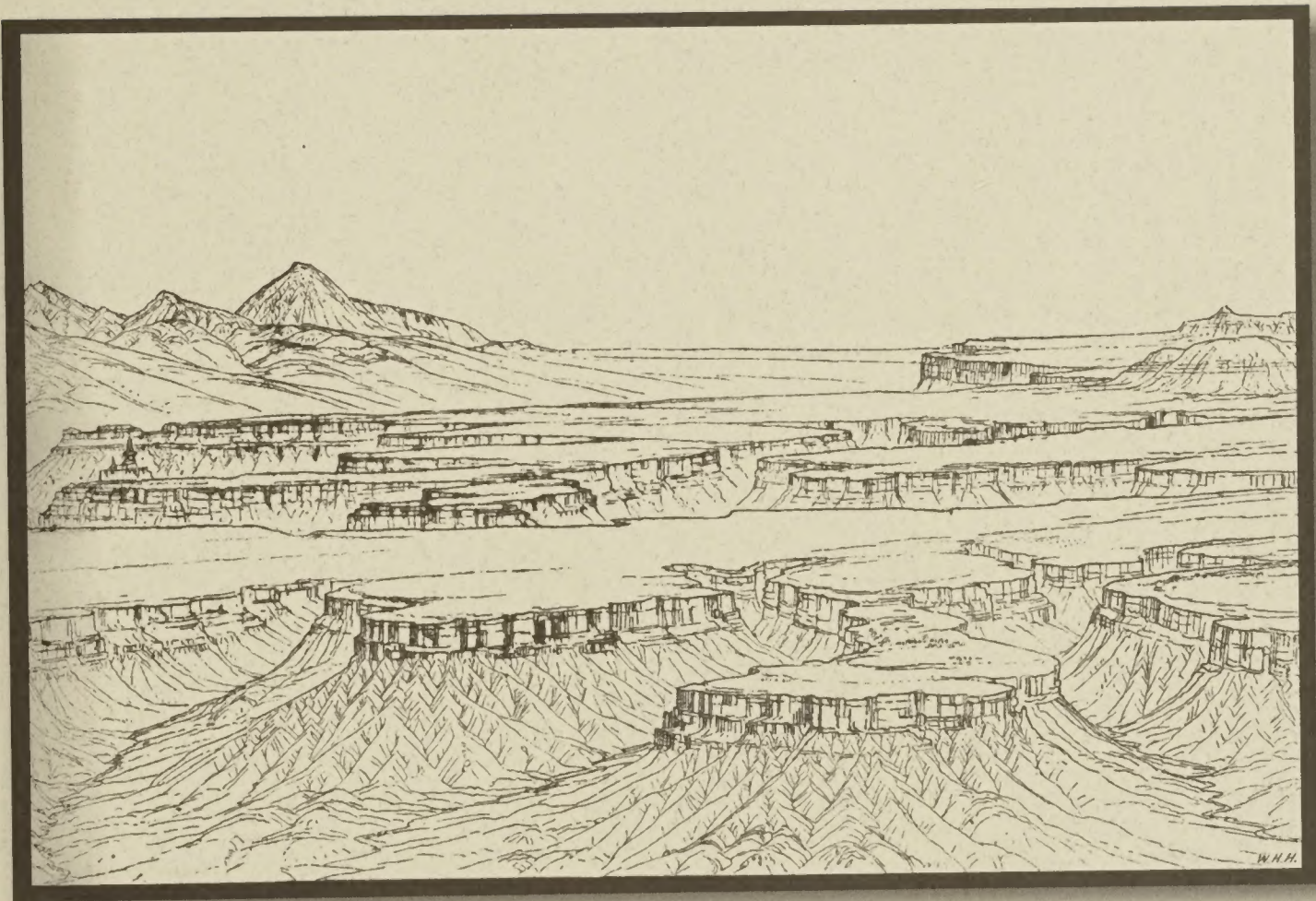
LIST OF PREPARERS

Name	Title	Agency	Assignment	Education	Years of Expertise
Michelle Bailey	Recreation Planner	BLM	Recreation	B.S., Parks and Recreation Mgmt.	6 Years
Gloria Benson	Native American Coordinator	BLM	Cultural Resources (American Indian Resources)		24 years
David Boyd	Public Affairs Specialist	BLM	Outreach, Editing, Scoping Report, Planning Bulletins, Technical Coordinator	B.S., Wildlife Biology M.A., Journalism	16 years
Hilary Boyd	Fire Ecologist	BLM	Fire Ecology (Occurrence, Risk)	B.S., Wildlife Biology M.S., Wildlife Science	9 years
Paula Branstner	Interpretive Specialist	NPS	Environmental Education and Interpretation	A.S., General Studies/ Occupational Therapy	17 years
Whit Bunting	Rangeland Management Specialist	BLM	Livestock Grazing, Vegetation (Rangelands)	B.S., Range Science	14 years
Rody Cox	Geologist, Lead for Minerals Program and Paleontological Resources	BLM	Geology, Paleontology, Minerals (Leasable and Locatable Minerals, Mineral Materials)	B.A., Biology M.S., Geology	22 years
Dennis Curtis	Monument Manager, Parashant	BLM	Management Overview, Planning Overview	M.S., Geography	37 years
William Dickinson	Superintendent, Lake Mead NRA	NPS	Management Overview	B.A., Landscape Architecture	31 years
Timothy Duck	Ecologist	BLM	Forest Products, Ecozones, Ecology, Restoration	B.S., Ecology and Evolutionary Biology	24 years
Tom Folks	Recreation, Wilderness, Cultural Team Leader	BLM	Travel Management, Recreation, Visual Resources, Back Country Byways, National and Regional Trails, Wild and Scenic Rivers, Wilderness	B.S., Recreation Park Planning and Resource Management	29 years
Laurie Ford	Lands and Geological Sciences Team Lead	BLM	Management Overview, Lands and Realty, Utility and Communication Corridors		24 years
Becky Hammond	Manager, Arizona Strip FO	BLM	Management Overview, Geology	B.S., Geology M.S., Geology	18 years
Kathleen Harcksen	Assistant Manager Parashant	BLM	Management Overview, Vegetation (Forests and Woodlands, Riparian and Wetlands)	B.S., Natural Resource Management	30 years

Name	Title	Agency	Assignment	Education	Years of Expertise
Diana Hawks	Planning Coordinator	BLM	Planning Team Lead, Cultural Resources (Archaeological, Historic, and American Indian Resources), ACECs	B.S., Archaeology M.A., Archaeology	31 years
Michael Herder	Wildlife Team Leader	BLM	Fish and Wildlife, Special Status Species (Animals), ACECs, Management Overview	B.S., Wildlife Management B.A., Zoology M.A., Marine Biology	26 years
John Herron	Archaeologist	BLM	Cultural Resources (Archaeological and Historical Resources), ACECs	B.A., Archaeology, Ecology and Evolutionary Biology	29 years
Jim Holland	Management Assistant, Lake Mead NRA	NPS	Management Overview, Lands and Reality, Recreation, Planning Overview	B.S., Zoology & Botany M.S., Biology	27 years
Lee Hughes	Ecologist	BLM	Special Status Species (Plants), Vegetation (Riparian and Wetlands), Areas of Critical Environmental Concern	A.S., Forestry B.S., Fishery and Range Management	32 years
Lillian Jonas	Writer/Editor	EnviroSystems Management	Document Writing and Editing	B.S., Biology M.A., Applied Sociology Ph.D., Sociology	15 years
Dave Kiel	GIS Specialist, Recreation Planner	BLM	GIS Data Development GIS Analysis Map/Graphics Development	B.S., Geography	17 years
Marisa Monger	GIS Specialist	BLM	GIS Data Development GIS Analysis Map/Graphics Development	B.A., Psychology	7 years
Kenneth Moore	Lead Natural Resource Specialist	BLM	Access, Vegetation (Forests and Woodlands), Forest Products, Restoration	B.S., Forest Management	36 years
Rosie Pepito	Cultural Resource Manager, Lake Mead NRA	NPS	Cultural Resources (Archaeological, Historical, and American Indian Resources)		19 years
Linda Price	Standards and Guides Team Leader, Vermilion Manager	BLM	Standards for Rangeland Health, Management Overview	B.S., Ecology	15 years

Robert Sandberg	Range Team Leader	BLM	Range and Vegetation, Management Overview	B.S., Botany & Zoology	28 years
Phillip Seegmiller	Rangeland Management Specialist	BLM	Vegetation (Forests and Woodlands, Rangelands, Riparian and Wetlands)	B.S., Outdoor Recreation/Range Management	25 years
Darla Sidles	Superintendent, Parashant	NPS	Lead Planner, Management Overview	B.A., Business Administration	19 years
Robert Smith	Hazmat, Soil, Water and Air Programs Lead	BLM	Air Quality, Water (Ground and Surface Water) Soil Resources, Health and Safety (Hazardous Materials)	B.S., Soil Science Graduate Certificate in Hazardous Waste Land Management	30 years
Richard Spotts	Environmental Coordinator	BLM	NEPA Compliance Review	B.A., Political Science J.D., Law	23 years
Jo Starr	GIS Specialist	NPS	GIS Data Development GIS Analysis	B.S., Natural Resources and Environmental Studies	8 years
Roger Taylor	District Manager, Arizona Strip	BLM	Management overview	B.S., Range Management	38 years
Kent Turner	Resource Management Chief, Lake Mead NRA	NPS	Management overview	B.S., Biology	25 years
Ron Wadsworth	Lead Law Enforcement Officer	BLM	Public Safety (Crime), Law Enforcement	B.S., Wildlife Biology	20 years
L.D. Walker	Noxious Weed Coordinator	BLM	Vegetation (Noxious Weeds), Fish and Wildlife (Invasive Species), Wild Horses and Burros	B.S., Zoology	28 years
Gary Warshefski	Assistant Superintendent, Lake Mead NRA	NPS	Management overview	B.S., Forestry M.S., Public Administration	28 years
Les Weeks	Consultant, Route Evaluations	ARS, Inc	Transportation/Access	B.A., Ecosystems Analysis M.A. Biogeography	23 years
Kari Yanskey	Botanist	NPS	Vegetation (Forests and Woodlands, Rangelands, Riparian and Wetlands), Special Status Species (Plants)	B.S., Biology	22 years

Appendices



“The Arizona Strip is one of the most remote regions on earth. It is five million acres of no electricity, no phone lines, and very little water. The lack of water is what kept it remote, plus the reality that the Grand Canyon defines its southern border. The fact that there are 280 miles of canyon with no highway bridge means there’s little reason for anyone to pass that way except out of curiosity. And even then it requires a stout vehicle and an even stouter heart.”

Lyman Hafen, 2001

Establishment of the Grand Canyon-Parashant National Monument (#7265)**By the President of the United States of America****A Proclamation**

The Grand Canyon-Parashant National Monument is a vast, biologically diverse, impressive landscape encompassing an array of scientific and historic objects. This remote area of open, undeveloped spaces and engaging scenery is located on the edge of one of the most beautiful places on earth, the Grand Canyon. Despite the hardships created by rugged isolation and the lack of natural waters, the monument has a long and rich human history spanning more than 11,000 years, and an equally rich geologic history spanning almost 2 billion years. Full of natural splendor and a sense of solitude, this area remains remote and unspoiled, qualities that are essential to the protection of the scientific and historic resources it contains. The monument is a geological treasure. Its Paleozoic and Mesozoic sedimentary rock layers are relatively undeformed and unobscured by vegetation, offering a clear view to understanding the geologic history of the Colorado Plateau. Deep canyons, mountains, and lonely buttes testify to the power of geological forces and provide colorful vistas. A variety of formations have been exposed by millennia of erosion by the Colorado River. The Cambrian, Devonian, and Mississippian formations (Muav Limestone, Temple Butte Formation, and the Redwall Limestone) are exposed at the southern end of the lower Grand Wash Cliffs. The Pennsylvanian and Permian formations (Calville Limestone, Esplanade Sandstone, Hermit Shale, Toroweap Formation, and the Kaibab Formation) are well exposed within the Parashant, Andrus, and Whitmore Canyons, and on the Grand Gulch Bench. The Triassic Chinle and Moenkopi Formations are exposed on the Shivwits Plateau, and the purple, pink, and white shale, mudstone, and sandstone of the Triassic Chinle Formation are exposed in Hells Hole.

The monument encompasses the lower portion of the Shivwits Plateau, which forms an important watershed for the Colorado River and the Grand Canyon. The Plateau is bounded on the west by the Grand Wash Cliffs and on the east by the Hurricane Cliffs. These cliffs, formed by large faults that sever the Colorado Plateau slicing north to south through the region, were and are major topographic barriers to travel across the area. The Grand Wash Cliffs juxtapose the colorful, lava-capped Precambrian and Paleozoic strata of the Grand Canyon against the highly faulted terrain, recent lake beds, and desert volcanic peaks of the down-dropped Grand Wash trough. These cliffs, which consist of lower and upper cliffs separated by the Grand Gulch Bench, form a spectacular boundary between the basin and range and the Colorado Plateau geologic provinces. At the south end of the Shivwits Plateau are several important tributaries to the Colorado River, including the rugged and beautiful Parashant, Andrus, and Whitmore canyons. The Plateau here is capped by volcanic rocks with an array of cinder cones and basalt flows, ranging in age from 9 million to only about 1000 years old. Lava from the Whitmore and Toroweap areas flowed into the Grand Canyon and dammed the river many times over the past several million years. The monument is pocketed with sinkholes and breccia pipes, structures associated with volcanism and the collapse of underlying rock layers through ground water dissolution.

Fossils are abundant in the monument. Among these are large numbers of invertebrate fossils, including bryozoans and brachiopods located in the Calville limestone of the Grand Wash Cliffs, and brachiopods, pelecypods, fenestrate bryozoa, and crinoid ossicles in the Toroweap and Kaibab formations of Whitmore Canyon. There are also sponges in nodules and pectenoid pelecypods throughout the Kaibab formation of Parashant Canyon. The Grand Canyon-Parashant National Monument contains portions of geologic faults, including the Dellenbaugh fault, which cuts basalt flows dated 6 to 7 million years old, the

Toroweap fault, which has been active within the last 30,000 years, the Hurricane fault, which forms the Hurricane Cliffs and extends over 150 miles across northern Arizona and into Utah, and the Grand Wash fault, which bounds the west side of the Shivwits Plateau and has approximately 15,000 feet of displacement across the monument.

Archaeological evidence shows much human use of the area over the past centuries. Because of their remoteness and the lack of easy road access, the sites in this area have experienced relatively little vandalism. Their good condition distinguishes them from many prehistoric resources in other areas. Prehistoric use is documented by irreplaceable rock art images, quarries, villages, watchtowers, agricultural features, burial sites, caves, rockshelters, trails, and camps. Current evidence indicates that the monument was utilized by small numbers of hunter-gatherers during the Archaic Period (7000 B.C. to 300 B.C.). Population and utilization of the monument increased during the Ancestral Puebloan Period from the Basketmaker II Phase through the Pueblo II Phase (300 B.C. to 1150 A.D.), as evidenced by the presence of pit houses, habitation rooms, agricultural features, and pueblo structures. Population size decreased during the Pueblo III Phase (1150 A.D. to 1225 A.D.). Southern Paiute groups replaced the Pueblo groups and were occupying the monument at the time of Euro-American contact. Archeological sites in the monument include large concentrations of ancestral Puebloan (Anasazi or Hitsuksinom) villages, a large, intact Pueblo II village, numerous archaic period archeological sites, Ancestral Puebloan sites, and Southern Paiute sites. The monument also contains areas of importance to existing Indian tribes. In 1776, the Escalante-Dominguez expedition of Spanish explorers passed near Mount Trumbull. In the first half of the 19th century, Jedediah Smith, Antonio Armijo, and John C. Fremont explored portions of this remote area. Jacob Hamblin, a noted Mormon pioneer, explored portions of the Shivwits Plateau in 1858 and, with John Wesley Powell, in the 1870s. Clarence Dutton completed some of the first geological explorations of this area and provided some of the most stirring written descriptions. Having traversed this area by wagon at the request of the territorial legislature, Sharlot Hall recommended it for inclusion within the State of Arizona when it gained Statehood in 1912. Early historic sawmills provided timber that was hauled 70 miles along the Temple Trail wagon road from Mt. Trumbull down the Hurricane Cliffs to St. George, Utah. Ranch structures and corrals, fences, water tanks, and the ruins of sawmills are scattered across the monument and tell the stories of the remote family ranches and the lifestyles of early homesteaders. There are several old mining sites dating from the 1870s, showing the history of mining during the late 19th and early 20th centuries. The remote and undeveloped nature of the monument protects these historical sites in nearly their original context.

The monument also contains outstanding biological resources preserved by remoteness and limited travel corridors. The monument is the junction of two physiographic ecoregions: the Mojave Desert and the Colorado Plateau. Individually, these regions contain ecosystems extreme to each other, ranging from stark, arid desert to complex, dramatic higher elevation plateaus, tributaries, and rims of the Grand Canyon. The western margin of the Shivwits Plateau marks the boundary between the Sonoran/Mojave/Great Basin floristic provinces to the west and south, and the Colorado Plateau province to the northeast. This intersection of these biomes is a distinctive and remarkable feature. Riparian corridors link the plateau to the Colorado River corridor below, allowing wildlife movement and plant dispersal. The Shivwits Plateau is in an arid environment with between 14 to 18 inches of precipitation a year. Giant Mojave Yucca cacti proliferate in undisturbed conditions throughout the monument. Diverse wildlife inhabit the monument, including a trophy-quality mule deer herd, Kaibab squirrels, and wild turkey. There are numerous threatened or endangered species as well, including the Mexican spotted owl, the California condor, the desert tortoise, and the southwestern willow flycatcher. There are also candidate or sensitive species, including the spotted bat, the western mastiff bat, the Townsend's big eared

bat, and the goshawk, as well as two federally recognized sensitive rare plant species: *Penstemon distans* and *Rosa stellata*. The ponderosa pine ecosystem in the Mt. Trumbull area is a biological resource of scientific interest, which has been studied to gain important insights regarding dendroclimatic reconstruction, fire history, forest structure change, and the long-term persistence and stability of presettlement pine groups.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431) authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

WHEREAS it appears that it would be in the public interest to reserve such lands as a national monument to be known as the Grand Canyon-Parashant National Monument:

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Grand Canyon-Parashant National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled "Grand Canyon-Parashant National Monument" attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 1,014,000 acres, which is the smallest area compatible with the proper care and management of the objects to be protected. For the purpose of protecting the objects identified above, all motorized and mechanized vehicle use off road will be prohibited, except for emergency or authorized administrative purposes. Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Arizona with respect to fish and wildlife management.

The establishment of this monument is subject to valid existing rights.

All Federal lands and interests in lands within the boundaries of this monument are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument. Sale of vegetative material is permitted only if part of an authorized science-based ecological restoration project. Lands and interests in lands within the proposed monument not owned by the United States shall be reserved as a part of the monument upon acquisition of title thereto by the United States.

This proclamation does not reserve water as a matter of Federal law nor relinquish any water rights held by the Federal Government existing on this date. The Federal land managing agencies shall work with appropriate State authorities to ensure that water resources needed for monument purposes are available.

The Secretary of the Interior shall manage the monument through the Bureau of Land Management and the National Park Service, pursuant to applicable legal authorities, to implement the purposes of this proclamation. The National Park Service and the Bureau of Land Management shall manage the monument cooperatively and shall prepare an agreement to share, consistent with applicable laws,

whatever resources are necessary to properly manage the monument; however, the National Park Service shall continue to have primary management authority over the portion of the monument within the Lake Mead National Recreation Area, and the Bureau of Land Management shall have primary management authority over the remaining portion of the monument.

The Bureau of Land Management shall continue to issue and administer grazing leases within the portion of the monument within the Lake Mead National Recreation Area, consistent with the Lake Mead National Recreation Area authorizing legislation. Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply to the remaining portion of the monument.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation. Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this eleventh day of January, in the year of our Lord two thousand, and of the Independence of the United States of America the two hundred and twenty-fourth.

WILLIAM J. CLINTON

APPENDIX 1.B

VERMILION CLIFFS NATIONAL MONUMENT PROCLAMATION (#7374)

Establishment of the Vermilion Cliffs National Monument (#7374)**By the President of the United States of America****A Proclamation**

Amid the sandstone slickrock, brilliant cliffs, and rolling sandy plateaus of the Vermilion Cliffs National Monument lie outstanding objects of scientific and historic interest. Despite its arid climate and rugged isolation, the monument contains a wide variety of biological objects and has a long and rich human history. Full of natural splendor and a sense of solitude, this area remains remote and unspoiled, qualities that are essential to the protection of the scientific and historic objects it contains.

The monument is a geological treasure. Its centerpiece is the majestic Paria Plateau, a grand terrace lying between two great geologic structures, the East Kaibab and the Echo Cliffs monoclines. The Vermilion Cliffs, which lie along the southern edge of the Paria Plateau, rise 3,000 feet in a spectacular escarpment capped with sandstone underlain by multicolored, actively eroding, dissected layers of shale and sandstone. The stunning Paria River Canyon winds along the east side of the plateau to the Colorado River. Erosion of the sedimentary rocks in this 2,500 foot deep canyon has produced a variety of geologic objects and associated landscape features such as amphitheaters, arches, and massive sandstone walls.

In the northwest portion of the monument lies Coyote Buttes, a geologically spectacular area where crossbeds of the Navajo Sandstone exhibit colorful banding in surreal hues of yellow, orange, pink, and red caused by the precipitation of manganese, iron, and other oxides. Thin veins or fins of calcite cut across the sandstone, adding another dimension to the landscape.

Humans have explored and lived on the plateau and surrounding canyons for thousands of years, since the earliest known hunters and gatherers crossed the area 12,000 or more years ago. Some of the earliest rock art in the Southwest can be found in the monument. High densities of Ancestral Puebloan sites can also be found, including remnants of large and small villages, some with intact standing walls, fieldhouses, trails, granaries, burials, and camps.

The monument was a crossroad for many historic expeditions. In 1776, the Dominguez-Escalante expedition of Spanish explorers traversed the monument in search of a safe crossing of the Colorado River. After a first attempt at crossing the Colorado near the mouth of the Paria River failed, the explorers traveled up the Paria Canyon in the monument until finding a steep hillside they could negotiate with horses. This took them out of the Paria Canyon to the east and up into the Ferry Swale area, after which they achieved their goal at the Crossing of the Fathers east of the monument. Antonio Armijo's 1829 Mexican trading expedition followed the Dominguez route on the way from Santa Fe to Los Angeles.

Later, Mormon exploring parties led by Jacob Hamblin crossed south of the Vermilion Cliffs on missionary expeditions to the Hopi villages. Mormon pioneer John D. Lee established Lee's Ferry on the Colorado River just south of the monument in 1871. This paved the way for homesteads in the monument, still visible in remnants of historic ranch structures and associated objects that tell the stories of early settlement. The route taken by the Mormon explorers along the base of the Paria Plateau would later become known as the Old Arizona Road or Honeymoon Trail. After the temple in St. George, Utah was completed in 1877, the Honeymoon Trail was used by Mormon couples who had already been

married by civil authorities in the Arizona settlements, but also made the arduous trip to St. George to have their marriages solemnized in the temple. The settlement of the monument area by Mormon pioneers overlapped with another historic exploration by John Wesley Powell, who passed through the monument during his scientific surveys of 1871.

The monument contains outstanding biological objects that have been preserved by remoteness and limited travel corridors. The monument's vegetation is a unique combination of cold desert flora and warm desert grassland, and includes one threatened species, Welsh's milkweed. This unusual plant, known only in Utah and Arizona, colonizes and stabilizes shifting sand dunes, but is crowded out once other vegetation encroaches.

Despite sporadic rainfall and widely scattered ephemeral water sources, the monument supports a variety of wildlife species. At least twenty species of raptors have been documented in the monument, as well as a variety of reptiles and amphibians. California condors have been reintroduced into the monument in an effort to establish another wild population of this highly endangered species. Desert bighorn sheep, pronghorn antelope, mountain lion, and other mammals roam the canyons and plateaus. The Paria River supports sensitive native fish, including the flannelmouth sucker and the speckled dace.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431) authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

WHEREAS it appears that it would be in the public interest to reserve such lands as a national monument to be known as the Vermilion Cliffs National Monument:

NOW, THEREFORE, I, William J. Clinton, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Vermilion Cliffs National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled "Vermilion Cliffs National Monument" attached to and forming a part of this proclamation.

The Federal land and interests in land reserved consist of approximately 293,000 acres, which is the smallest area compatible with the proper care and management of the objects to be protected.

All Federal lands and interests in lands within the boundaries of this monument are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument. For the purpose of protecting the objects identified above, the Secretary shall prohibit all motorized and mechanized vehicle use off road, except for emergency or authorized administrative purposes.

Lands and interests in lands within the proposed monument not owned by the United States shall be reserved as a part of the monument upon acquisition of title thereto by the United States.

The Secretary of the Interior shall manage the monument through the Bureau of Land Management, pursuant to applicable legal authorities, to implement the purposes of this proclamation.

The Secretary of the Interior shall prepare a transportation plan that addresses the actions, including road closures or travel restrictions, necessary to protect the objects identified in this proclamation.

The establishment of this monument is subject to valid existing rights.

Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Arizona with respect to fish and wildlife management.

This proclamation does not reserve water as a matter of Federal law.

Nothing in this reservation shall be construed as a relinquishment or reduction of any water use or rights reserved or appropriated by the United States on or before the date of this proclamation. The Secretary shall work with appropriate State authorities to ensure that any water resources needed for monument purposes are available. Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation. Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this ninth day of November, in the year of our Lord two thousand, and of the Independence of the United States of America the two hundred and twenty-fifth.

WILLIAM J. CLINTON

APPENDIX 1.C

RESULTS OF SCOPING

RESULTS OF SCOPING

On Wednesday, April 24, 2002 (Vol. 67, No. 79, pp. 20155-20156), the Notice of Intent (NOI) to prepare a RMP and GMP for the Parashant and a RMP for Vermilion and to revise the 1992 Arizona Strip RMP was published in the Federal Register (See Appendix 1.F for the NOI). This initiated a 90-day public scoping and comment period.

The agencies then published a newsletter and held 11 open houses in 2002 to encourage public input on the future management of the monuments and the Arizona Strip FO. Eight cooperating agencies and a dozen other federal and state agencies provided information and input into development of the Draft Plan/DEIS. From all this input, the BLM and NPS developed four conceptual alternatives that were presented to the public via newsletters and five open houses. These preliminary alternative public meetings were held in 2003. Information from these meetings, the Cooperating Agencies and interested state and Federal agencies, and the public was then used to develop this Draft Plan/DEIS (See entire Scoping Report at <http://www.az.blm.gov/LUP/strip/reports.htm>).

COMMUNITY BASED WORKSHOPS AND COLLABORATIVE PLANNING

Before the NOI was published, the following community based workshops were held on and near the Arizona Strip with the assistance of the Partnership Series and James Kent Associates. Members of communities in and near the Arizona Strip were invited to participate; over one hundred people attended these workshops (see Table 1 for the dates and communities in which the workshops were held). The goals of these workshops were:

- 1) to gather information regarding the future of the Arizona Strip from the local communities, agencies, groups, and individuals;
- 2) to inform about the upcoming planning effort;
- 3) to encourage the initiation of community based planning groups on the Arizona Strip; and
- 4) to encourage active participation and involvement in planning for the future on the Arizona Strip.

Table 1: Community Based Workshops

Event	Dates	Location
Community-Based Partnership*	May 19-21, 2001	St. George, Utah
Community-Based Partnership*	January 31-February 1, 2002	Kaibab Village, Arizona
Community-Based Partnership*	March 2002	St. George, Utah
Community-Based Stewardship**	November 30-December 1, 2002	St. George, Utah
Community-Based Stewardship**	February 22-23, 2002	Page, Arizona

*Offered by the Partnership Series, Community-Based Partnerships and Ecosystems: Ensuring A Healthy Environment, a 3-day workshop

** Offered by James Kent Associates, a 12-hour workshop

James Kent Associates (JKA) also worked with BLM and NPS staff on the Community Discovery process in October of 2001 for the western half of the Arizona Strip and in December of 2001 for the eastern half of the Arizona Strip. JKA and staff worked out of St. George, Utah for the first session and out of Kanab, Utah for the second. Informal interviews were conducted with people living in communities on and adjacent to the Arizona Strip. Their informal input was solicited about concerns on the public lands or on future management.

Some of the main lessons learned from these workshops were:

- 1) People were concerned about public lands but did not attend unless they were already negatively impacted by land management decision(s).
- 2) The Arizona Strip is too large a geographic area to have a single community.
- 3) The perception that the government is going to do what it wants to do anyway kept many people away from workshops.

Formal Presentations to American Indian Tribal, Band, and Chapter Councils

Before and after the NOI was published, in accordance with the National Environmental Policy Act, the National Historic Preservation Act, and Executive Order 13007, meetings were held with American Indian tribal, band, and chapter councils and members. The goal of these meetings was to inform and solicit input into the planning process from all American Indians living on or near the Arizona Strip or having cultural or ancestral ties to those who are living or once lived in the planning area. Table 2 below lists those meetings.

The meetings with the tribal councils had three purposes:

- 1) to describe the proposed land use plan revisions,
- 2) to discuss planning schedules; and
- 3) to gather comments focusing on traditional cultural issues as they related to the planning process.

Table 2: Meetings with American Indian Tribes, Bands, and Councils		
Date	Tribe, Band, or Council	Meeting Location
2001		
August	Paiute Tribe of Utah General Council	Cedar City, Utah
August 30	Hopi Cultural Resources Advisory Task Team	Second Mesa, Arizona
2002		
January 9	Shivwits Band Council	Shivwits Indian Reservation
February 20	Hopi Cultural Preservation Office	Kykotsmovi, Arizona
February 21	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
March 12	Moapa Paiute Tribe	Moapa, Nevada
April 12	Hualapai Tribal Council	Peach Springs, Arizona
May 14	Kanosh Band	Kanosh, Utah
May 15	Cedar Band	Cedar City, Utah
May 28	Koosharem Band	Cedar City, Utah
July 22	Hualapai Public Scoping	Peach Springs Community Bldg.
October 17	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
December 3	Hopi Tribe	Kykotsmovi, Arizona
2003		
February 5	Las Vegas Paiute Tribe	Las Vegas, Nevada
February 5	Las Vegas Indian Center	Las Vegas, Nevada
March 19	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
September 17	Southern Paiute Tribal Chairpersons Association	Pipe Springs, Arizona
September 18	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
October 14	Moapa Paiute Tribe	Moapa, Nevada
October 14	Navajo Nation-Cameron Chapter	Cameron, Arizona
October 22	Navajo Nation-Tuba City Chapter	St. George, Utah
October 23	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona
2004		
January 22	Kanosh Band of the PITU	Cedar City, Utah
February 6	Kaibab Paiute Cultural Resources	Fredonia, Arizona
February 13	PITU Cultural Resources	St. George, Utah
March 30	San Juan Southern Paiute	Hidden Springs, Arizona
September 16	Las Vegas Paiute Tribe	Las Vegas, Nevada
October 2	Kaibab Paiute Tribe Annual Meeting	Kaibab Village, Arizona
October 26	Southern Paiute Tribal Chairpersons Association	St. George, Utah
2005		
May 19	Kaibab Band of Southern Paiutes	Pipe Springs, Arizona

PUBLIC SCOPING MEETINGS

Ten informal open house public scoping meetings were held during the summer of 2002, in order to identify planning issues. An additional open house was held at Peach Springs, Arizona at the invitation of the Hualapai Tribe. Table 3 details these scoping meetings. These open houses provided the public an opportunity to receive information on the Arizona Strip planning effort, to ask questions, and to provide input. In addition, the public was asked questions on what they valued about these lands, what kinds of activities or uses were important to them, and how they wanted to see the land managed.

Date	Location	Number of attendees
May 28, 2002 (Tuesday)	Beaver Dam, AZ	17
May 29, 2002 (Wednesday)	St. George, UT	47
May 30, 2002 (Thursday)	Colorado City, AZ	27
May 31, 2002 (Friday)	Fredonia, AZ	23
June 3, 2002 (Monday)	Page, AZ	25
June 4, 2002 (Tuesday)	Flagstaff, AZ	176
June 5, 2002 (Wednesday)	Phoenix, AZ	37
June 6, 2002 (Thursday)	Kingman, AZ	33
June 10, 2002 (Monday)	Salt Lake City, UT	20
June 12, 2002 (Wednesday)	Las Vegas, NV	39
July 22, 2002 (Monday)	Peach Springs, AZ	17
TOTAL		461

PLANNING ISSUES AND MANAGEMENT CONCERNS

A planning issue is a matter of wide public concern about resource management problems that may hinder BLM and NPS from fulfilling their missions. Management concerns are topics or points of dispute that involve a resource management activity or land use. Although concerns and issues sometimes overlap, a management concern is generally more important to a few individuals, and a planning issue has a more widespread point-of-conflict.

A total of 2,219 comment letters, with 12,800 individual comments, were received as a result of public scoping in 2002. Sixteen hundred of these, or 72%, were form letters. Table 3 below presents the number of individual comments received per issue. Based on public comments, interagency and staff discussions, and information available on the resources of the Arizona Strip at the present time, the following were identified as the planning issues and management concerns to be addressed on the Arizona Strip Draft Plan/DEIS.

Based on this breakdown, the top issues to be covered in the DEIS were defined and ranked; access, wilderness, protection of resources, livestock grazing, and recreation.

Category	Number of Comments
Transportation and Access	2,071
Wilderness	1,838
General	1,811
Monument Resources	1,749
Biological Resources	1,649
NEPA and Planning	1,612
Livestock Grazing	302
Recreation	247
Fish and Wildlife	139
Archeological and Historic Resources	134
Arizona Strip Resources	128
Remoteness	103
*Includes 1,600 form letters	

Transportation/Access – More than 2,000 comments were received about this issue – more than any other issue. Comments varied from off-highway vehicle (OHV) and four-wheel drive enthusiasts, who wanted to keep as many roads open as possible, to wilderness proponents who favored closing a number of roads. Baseline route inventories have been completed for the planning effort in both monuments and in the Littlefield and St. George Subregions. The resources were not available to complete the route inventories for the Arizona Strip FO in time for consideration in the DEIS.

Wilderness – More than 1,800 comments about wilderness were received. Wilderness is thought by some groups and individuals as the best way to protect resources, particularly those identified in the proclamations for both monuments. Other people expressed concern about creating additional wilderness study areas on the Strip.

Protection of Resources – More than 1,700 people commented on the manner in which to protect and/or manage the natural and cultural resources of the Arizona Strip. Their comments varied according to the individual or group. Included under this issue are monument objects, biological, archaeological, historical, and Arizona Strip resources in general.

Livestock Grazing – About 300 comments were received about grazing. These ranged from supporting all livestock grazing on the Strip to ending all grazing in the monuments. Others advocated ending grazing in ecologically sensitive areas only.

Recreation – About 250 people commented about recreation. People stated they use the isolated Arizona Strip to get away from people and cities, explore, sightsee, hike, backpack, birdwatch, ride ATVs or mountain bikes, and hunt. Recreation demand on the Strip is likely to grow as population in southern Nevada, southern Utah, and northern Arizona increases.

Management concerns were identified by interagency staff and managers as:

- 1) Restoration of ecological systems
- 2) Community growth and involvement

Restoration – Restoration of degraded ecosystems is an important management concern. Disruption of the natural fire regime has caused degradation of ecosystems within the Arizona Strip. Grasslands are being overrun by shrubs; shrublands by pinyon and junipers; and ponderosa pine stands are unnaturally thick. Dense pinyon/juniper and ponderosa pine woodlands have the potential to carry catastrophic fire. Riparian areas have also changed due, in part, to invasive, non-native woody plant species.

Community Growth and Involvement - This tri-state region is one of the most rapidly growing areas of the United States. In 2000, St. George, Utah was identified for the first time as a metropolitan area by attaining a population of more than 50,000. Projected growth during the life of the plan will turn the region from mostly rural to urban, particularly in the northwestern portion of the Planning Area near Mesquite, Nevada and St. George, Utah. Involvement of the communities is an important part of the planning effort. Community Based Workshops, broad collaboration, active American Indian consultation and field trips, and Cooperating Agencies helped to involve those most affected by the decisions made in this Draft Plan/DEIS.

PRELIMINARY ALTERNATIVE SCOPING PROCESS

The Arizona Strip planning team prepared preliminary management alternatives for the planning area. The planning team presented the preliminary alternatives to the public beginning in May 2003. This allowed the public an additional opportunity to participate in the overall planning process. Because alternatives are the driving force behind any Environmental Impact Statement (EIS), it was felt that additional public participation at this critical juncture (before the draft EIS was completed) would improve the alternatives and subsequent management plans.

The public received information and an invitation to comment on the preliminary alternatives through several newsletters. Public scoping meetings on these preliminary alternatives were held in five cities in June 2003 (See Table 5 below). This allowed many individuals, organizations, agencies, and groups the opportunity to state their concerns and provide useful suggestions before the finalization of the alternatives.

Another result of the preliminary alternative scoping process was increased awareness and participation in the planning effort at both the local and national levels. Meeting attendance was larger than the initial scoping meetings held during the summer of 2002. The preliminary alternative scoping period generated 6,272 comment letters with a total of 40,741 individual concerns and remarks. This is nearly triple the amount when compared to the 2,219 comment letters received at the scoping meetings in 2002.

Date	Place	Attendance	Comments
June 2	Mesquite, NV	13	2
June 3	St. George, UT	85	7
June 4	Fredonia, AZ	41	0
June 5	Kingman, AZ	36	2
June 6	Flagstaff, AZ	174	31
TOTALS		349	42

Most of those who commented showed their preference for one of the five preliminary alternatives (Preliminary Alternatives A-D, and the No Action Alternative). Many of these individuals also supported their preference by providing a reason why they preferred one preliminary alternative to another. Very few individuals showed a preference for Preliminary Alternative B or C, with most split between Preliminary Alternative A and Preliminary Alternative D and/or the No Action Alternative.

COOPERATING AGENCIES

Ten Cooperating Agencies worked on this Draft Plan/DEIS with the BLM and NPS. They include: Mohave and Coconino counties, Arizona; Washington and Kane counties, Utah; Kaibab Paiute Tribe; Federal Highway Administration; the communities of Fredonia and Colorado City, Arizona; Arizona Department of Transportation and Arizona Game and Fish Department.

Agencies within three federal departments also worked with the NPS and BLM on this Draft Plan/DEIS; the Department of Interior, the Department of Agriculture, and the Department of Defense. Federal agencies within these departments include four BLM offices in Utah and Nevada (Las Vegas, St. George, and Kanab field offices and the Grand Staircase-Escalante National Monument), the North Ranger District of the Kaibab Forest, three units of the NPS (Lake Mead and Glen Canyon NRA and Grand Canyon National Park), the Air Force Regional Environmental Office, and the US Fish and Wildlife Service. In addition, the Arizona State Land Department and the Hopi Tribe also received information on this planning effort along with the Cooperating Agencies.

IMPACT TOPIC CONSIDERED BUT DISMISSED FROM FURTHER EVALUATION

The following impact topic was discussed during the planning process, but was dismissed from further consideration for the reason provided:

Social and Economic Conditions (Indian Trust Assets)

The United States has a trust responsibility to protect and maintain rights or resources reserved by or granted to American Indian tribes or individuals by treaty, statute, and executive order. Assets are anything owned that has monetary value. This trust responsibility requires that agencies such as the BLM and the NPS take reasonable actions when necessary to protect these assets or provide appropriate mitigation or compensation when adverse impact cannot be avoided. The assets need not be owned outright, but could be some other type of property interest, such as a lease or a right to use something. Assets can be real property, physical assets, or intangible property rights.

The Planning Area surrounds the Kaibab-Paiute Indian Reservation on three sides. The Hualapai and Havasupai Reservations are across the Colorado River south of, but not contiguous with, the Parashant. The Navajo Reservation is across the Colorado River east of, but not contiguous with, the Arizona Strip FO. Treaties and Executive Orders creating the reservations on and near the Arizona Strip do not identify specific Indian trust assets off-reservation over which the BLM or NPS has control. No Indian trust assets would be impacted by the management actions presented in the alternatives.

ISSUES CONSIDERED BUT NOT ADDRESSED

The Council on Environmental Quality (CEQ) guidelines for implementing NEPA require federal agencies to analyze all “reasonable” alternatives that substantially meet the purpose and need for this Draft Plan/DEIS. The purpose of this Draft Plan/DEIS is to provide for management of the Parashant and Vermilion within the provisions of the proclamations, to provide management for the Arizona Strip FO, and to meet the requirements of the Federal Land Policy and Management Act (FLPMA), the NPS Organic Act, and other laws and regulations. Because the monument proclamations state that certain uses will not continue and other uses will continue, consistent with federal laws and regulations, actions not complying with the proclamations do not meet the purpose and need for this Draft Plan/DEIS and are, therefore, not included in alternatives that were analyzed in this document.

The following specific alternatives, or actions that could be components of alternatives, were suggested but not analyzed or carried forward because they do not fulfill the requirements and needs of this Draft Plan/DEIS.

Recommendations for BLM Wilderness Study Areas

The Arizona Wilderness Coalition and members of the public provided recommendations on wilderness study areas (WSAs) in the monuments and in the Arizona Strip FO. In addition, the planning team was working toward making recommendations for WSAs in the Draft Plan/DEIS early in the planning process. However, recent guidance clarified that BLM's authority to designate WSAs expired in 1993, resulting in the termination in any attempts to designate new WSAs (See Chapter 1). BLM and NPS have, however, assessed wilderness characteristics (naturalness, solitude, and primitive recreation) on BLM and NPS lands in the Planning Area and proposed management actions regarding where, how, and to what extent these characteristics may be managed under Alternatives B, C, D, and E.

The Arizona Wilderness Coalition also provided comments and proposed management prescriptions on areas managed to maintain or enhance wilderness characteristics. Including this information or these prescriptions would be contrary to BLM policy as outlined in BLM IM 2003-274 and IM 2003-275 and more recent guidance in IM AZ-2005-007, Guidelines for achieving consistency in ongoing and future Arizona Land Use Planning efforts.

NPS proposed wilderness within the Parashant is not affected by the recent BLM guidance regarding WSAs, and no additional NPS lands have been proposed for wilderness in this document. However, as stated above, the NPS has assessed its remaining lands in Parashant for wilderness characteristics.

No Livestock Grazing in the Monuments

Proclamation 7265 for the Parashant states:

“The BLM shall continue to issue and administer grazing leases within the portion of the monument within the Lake Mead NRA, consistent with the Lake Mead NRA authorizing legislation. Laws, regulations, and policies followed by the BLM in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply to the remaining portion of the monument.”

Proclamation 7374 for the Vermilion similarly states, “Laws, regulations, and policies followed by the BLM in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument.”

Based on the above proclamation provisions, a no-livestock grazing alternative would not meet the purpose and need of this Draft Plan/DEIS, nor would it meet BLM's principle of multiple use and sustained yield (FLPMA Sec. 302 (a), also see FLPMA Sec. 102(7)).

No Routes in the Monuments

Some public comments proposed closing all routes in the monuments to protect monument objects. Both the Parashant and Vermilion proclamations noted that "outstanding biological objects have been preserved by remoteness and limited travel corridors," and the Parashant proclamation recognized that "because of [archaeological sites'] remoteness and lack of easy road access, the sites have experienced relatively little vandalism." The Secretary of Interior was thus able to recommend these areas for monument designation because of the remoteness, lack of easy road access, and condition of the resources to be protected. Closing all routes in the monuments is thus not vital to protect monument resources. The Secretary also directed the BLM to prepare a transportation plan for the Vermilion, which presupposes the need for maintaining at least some open roads. The need for access by the public and those holding valid existing rights further made the decision to close all roads unreasonable.

Other Alternatives

Outside interests, including state and local governments, tribes, or other interest groups submitted no comprehensive alternatives.

Relevant Laws, Executive Orders, and Memorandums

Law/Regulation	Applies to:
LAWS	
Act of March 3, 1909 as amended and Act of May 11, 1938	Minerals on Indian Lands
Administrative Procedures Act of 1946 5 USC 551 et seq.	Procedures
Airport and Airway Improvement Act of 1982	Conveyance of land for airport
American Indian Religious Freedom Act of 1978 (AIRFA) 42 USC 1996	Native American religious places and access
Antiquities Act of 1906	Cultural Resources, National Monuments, special areas
Archeological Resources Protection Act (ARPA) 16 USC 470	Archaeological resources
Arizona Wilderness Act of 1984	Established eight wilderness areas on Arizona Strip
Clean Air Act of 1970, as amended 1990 42 USC 7401 et seq.	Air quality
Clean Water Act of 1987, as amended 33 USC 1251 et seq.	Surface water quality
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986	Hazardous sites
Electronic FOIA Act of 1996 PL 104-231	Information available in electronic format
Endangered Species Act of 1973(ESA) 16 USC 1531 et seq., as amended	Threatened and endangered species
Energy Policy Act of 1992 42 USC 13201	Energy
Federal Advisory Committee Act of 1972	Public meetings, committees, information
Federal Cave Resource Protection Act of 1988	Caves
Federal Land Exchange Facilitation Act of 1988 (FLEFA), 43 USC 1716, 1740	Federal land exchanges
Federal Land Policy and Management Act of 1976 (FLPMA), 43 USC 1701	Federal lands, special management areas, planning
Federal Noxious Weed Act of 1974, as amended	Noxious weeds
Federal Onshore Oil and Gas Leasing Reform Act of 1987	Oil and Gas

Federal Pollution Control Act, as amended 1972	Watersheds
Freedom of Information Act (FOIA) of 1966 and Electronic Freedom of Information Act, as amended 1996, 5 USC 552	Public Access to information
Government Performance Results Act of 1993	Strategic Goals, program efficiencies
Historic Sites Act of 1935	Historic Sites
Information Technology Management Reform Act of 1996	Use of Information Technology
Land and Water Conservation Fund Act of 1965	Outdoor recreation
Materials Act of 1947, as amended	Mineral materials
Migratory Bird Conservation Act of 1929, as amended	Migratory Birds
Migratory Bird Treaty Act of 1918, as amended	Migratory Birds
Mineral Leasing Act of 1920, as amended and Mineral Leasing Act for Acquired Lands of 1947	Leasable minerals
Mining and Minerals Policy Act of 1970	Mining
Mining in the Parks Act of 1912	Mining
Mining Law of 1872, as amended	Mining claims
National Parks Overflights Act, PL 100-91	Study of overflights and associated noise in national park units, particularly Grand Canyon NP; allows helicopter flights from north rim to Hualapai Reservation to transport individuals to/from boat trips on Colo River
National Parks Air Tour Management Act of 2000	Air tours
National American Graves Protection and Repatriation Act of 1990	Native American human remains, cultural objects, and sacred objects
National Environmental Policy Act of 1969 (NEPA) 42 USC 4321 et seq., as amended	Federal undertakings
National Historic Preservation Act of 1966 (NHPA)	Archaeological and historic properties
National Materials and Minerals Policy Research Development Act of 1980	Mineral resources
National Park Service Organic Act of 1916	
National Parks and Recreation Act of 1978	National Historic Trails
National Trails System Act of 1968, as amended	National Trails

Old Spanish Trail National Historic Trail Act of 2002, PL 107-325	Old Spanish Trail national historic trail designation
Public Rangelands Improvements Act of 1978	Rangeland and wildlife management
Privacy Act of 1974, 5 USC 552a	Privacy of information
Recreation and Public Purposes Act of 1926, as amended and R&PP Amendment Act of 1988	Land disposal for public purposes
Reorganization Plan No. 3 of 1946	Establishes the BLM
Resource Conservation and Recovery Act of 1986, as amended (RCRA)	Hazardous or solid waste
Sikes Act of 1974, 16 USC 1170	Fish and wildlife management
Soil Conservation and Domestic Allotment Act of 1935	Watersheds
Soil and Water Resources Conservation Act of 1977	Conservation, protection, and enhancement of soil, water, and related resources
Surface Mining Control and Reclamation Act of 1977	Coal mining
Taylor Grazing Act of 1934	Livestock grazing
Treasury and General Government Appropriations Act of 2001 (P.L. 106-554; HR 5658)	Sec. 515, Information Quality Act for quality, objectivity, utility, and integrity of information
Timber on the Public Lands 16 USC 594	Protection of timber
Water Quality Act of 1987	Riparian areas, wetlands
Watershed Protection and Flood Control Act of 1954	Watersheds
Wild and Scenic Rivers Act of 1968 (WSRA) 16 USC 1271 et seq.	Wild and scenic rivers
Wild Free Roaming Horse and Burro Act of 1971, as amended 1978	Wild Horse and Burro
Wilderness Act of 1964	Wilderness
ORDERS & MEMORANDUM	
Secretary of the Interior Order 3175 (2 DM 512)	Indian trust assets
Executive Order 11514	Protection and enhancement of environmental quality
Executive Order 11593	Preservation of the cultural environment
Executive Order 11644 & 11989	Off-road vehicles
Executive Order 11988	Flood plain management
Executive Order 11990	Wetlands, riparian zones
Executive Order 12088	Pollution Control
Executive Order 12898	Environmental justice

Executive Order 12906	Data standards
Executive Order 12962	Recreational Fishing
Executive Order 13007	Indian Sacred sites
Executive Order 13112	Invasive species
Executive Order 13175	Tribal Consultation and Coordination
Executive Order 13186	Migratory Birds
Executive Order 13212	Energy policy
Executive Order 13287	Preserve America
Presidential Proclamation 7265 of January 11, 2000	Established Grand Canyon-Parashant National Monument
Presidential Proclamation 7374 of November 19, 2000	Established Vermilion Cliffs National Monument
CEQ memo on Cooperating Agency Status, 1/30/02	Cooperating agency status for federal agencies
CEQ memo on ident. non-federal cooperating agencies, 09/25/2000; CEQ memo on design. non-federal cooperating agencies, 7/28/1999	Cooperating agency status for non-federal agencies
CEQ memo on Environmental Justice, 12/10/1999	Environmental Justice
CEQ memo regarding pollution prevention, 1/12/1993	Pollution prevention and NEPA
CEQ memo on scoping, 4/30/1981	Scoping
CEQ memo on agricultural lands, 8/11/1980 and Analysis of impacts related to agricultural lands, 8/11/1980	Agricultural lands and NEPA
CEQ memo on Wild & Scenic Rivers and NHT, 8/2/1979 and consultation to mitigate effects on rivers, 8/10/1980	Wild and Scenic Rivers and National Historic Trails
CEQ memo on implementing CEQ NEPA regulations, 1/19/1979	NEPA
CEQ memo on implementing E.O. 12114, 3/21/1979	NEPA and federal actions outside the U.S.A
CEQ Guidance on NEPA Regulations, 1983	NEPA
CEQ Guidance on Section 404(r) of Clean Water Act involving dredging and fill, 11/17/1980	Clean Water Act
CEQ 40 most asked questions for NEPA, 3/23/1981	NEPA
CEQ explanation on implementing E.O. 11988 and E.O. 11990, 3/21/1978	Floodplain management and Wetlands
CEQ Env review related to Section 1424(e) of the Safe Drinking Water Act of 1974	Water

APPENDIX 1.E

PLANNING CRITERIA (BLM)

PLANNING CRITERIA (BLM)

BLM planning regulations (43 CFR 1610) require preparation of planning criteria to guide development of all plans. Planning criteria ensure that plans are tailored to the identified issues and ensure that unnecessary data collection and analysis are avoided. Planning criteria are based on applicable law, agency guidance, public comment, and coordination with other Federal, state and local governments, and Native American Indian tribes.

The planning criteria used in developing the plans for Grand Canyon-Parashant National Monument (Parashant), Vermilion Cliffs National Monument (Vermilion), and the Arizona Strip Field Office (Arizona Strip FO) are as follows:

The plans will be completed in compliance with the Federal Land Policy and Management Act. The Parashant Management Plan will also be completed in compliance with the Lake Mead Enabling Legislation and with the National Park Service Organic Act requirements and NPS policies. The Endangered Species Act, the National Environmental Policy Act, the National Historic Preservation Act, the Clean Water Act, and other federal laws and executive orders and management policy requirements would also be met.

The two national monument plans will be consistent with their respective proclamations, meeting their purpose, preserving their significance, and complimenting their mission.

The plan data and maps will present information in three geographic areas, Grand Canyon-Parashant National Monument, Vermilion Cliffs National Monument, and the remaining BLM administered lands on the Arizona Strip. The final products will be four separate Records of Decision and three stand-alone management plans.

Valid existing management decisions from previous plans, if appropriate, may be carried forward into this plan or subsequent activity and/or implementation plans. Decisions from the following plans will be considered and may be modified or amended: Arizona Strip Resource Management Plan (1992) as amended, Mojave Desert Plan Amendment (1998), Lake Mead National Recreation Area General Management Plan (1986), Lake Mead National Recreation Area Resource Management Plan (1999), Lake Mead Burro Management Plan (1995), Lake Management Plan (2002), Parashant (1997) and Mt. Trumbull (1995) Resource Conservation Area Plans, Paria Canyon-Vermilion Cliffs Wilderness Management Plan (1986), Paiute and Beaver Dam Mountains Wilderness Management Plan (1990), Mt. Trumbull and Mt. Logan Wilderness Management Plan (1990), Grand Wash Cliffs Wilderness Management Plan (1990), Cottonwood Point Wilderness Management Plan (1991), Habitat Management Plans and the Arizona Strip Bighorn Sheep Management Plan (May 2001).

The management plan will be consistent with officially approved or adopted resource related plans, policies and programs of other Federal agencies, State and local governments and Indian

tribes, so long as their plans, policies and programs are consistent with the purposes, policies, and programs of Federal laws and regulations.

Terms and Conditions and reasonable and prudent alternatives from all applicable Final Biological Opinions will be implemented. Conservation measures will be included.

Cooperating Agency status will be encouraged for affected Federal, State and local governments and Indian tribes. The environmental analysis input and proposals of Cooperating Agencies will be used to the maximum extent possible consistent with BLM and NPS responsibilities (43 CFR 1501.6 (a) (2)).

An adaptive management approach will be followed to achieve desired outcomes. Monitoring outlined in the plan will be used to determine if land use plan level desired outcomes are being achieved. If not, implementation actions and/or allowable uses will be modified to achieve land use plan objectives.

The plan will emphasize ecological restoration and preservation of natural and cultural resources. It will identify opportunities and priorities for research and monitoring related to the key resource values of the two national monuments.

The statewide land health standards, established by the Arizona Resource Advisory Council and approved by the Secretary of Interior, will be used to evaluate all surface disturbing activities on BLM administered lands and on Lake Mead National Recreation Area lands where BLM administers grazing privileges. For NPS lands on the Parashant, policies and procedures by which the NPS carries out its responsibilities under NEPA will be followed (DO-12 and DO-55), including identification of thresholds and impairment.

The plan will not identify any BLM lands for designation as Wilderness Study Areas (WSAs). BLM and NPS may, however, maintain or enhance lands with wilderness characteristics such as lands that remain in a natural condition, or those that provide outstanding opportunities for solitude, or primitive and unconfined types of recreation activities. These lands may be managed to maintain or enhance wilderness characteristics. The 1979 Lake Mead National Recreation Area wilderness proposal will be brought forward as the decision of record. Minor, non-controversial changes may be made, if necessary for resource protection concerns. NPS Reference Manual # 41 will be followed for guidance on wilderness preservation and management on NPS land within the monument.

Route inventories will be completed for both monuments and will be used as baseline data for trail and travel management planning. All lands within the monuments would be designated as either "limited" or "closed" to motorized and mechanized vehicle uses. Decisions concerning specific routes in "limited" areas would result in a designated travel management network for the monuments. Arizona Strip lands outside the two monuments will be designated as "open," "limited" or "closed" to motorized and mechanized vehicle uses. As the availability of route

inventory data allows, decisions concerning specific routes in “limited” areas will be made in the land use plan. Decisions about specific routes for those areas with insufficient inventory would be deferred until inventory is complete. A final travel management network for the Arizona Strip FO will be achieved within 5 years of the LUP ROD. An authorized road system for NPS lands in Parashant was designated in 1986 and will not be readdressed in this plan, except for minor adjustments as needed for resource protection.

The plan will directly involve American Indian tribal governments by providing strategies for the protection of recognized sacred and traditional uses and sites.

The lifestyles of area residents, including the activities of grazing, hunting, other resource uses, and recreation, will be recognized in the plan. Much of the Strip's historic value is connected with ranching operations, both past and present. Vintage ranching structures and facilities hold great historical and social significance and will be incorporated into the plan.

The plan will not address monument or statutory wilderness boundary adjustments.

Any new visitor centers considered would be located outside the monuments and generally within existing communities.

The plans will set forth a framework for managing recreation and commercial activities in order to produce a variety of beneficial outcomes gained through safe and enjoyable visitor experiences and activities that require appropriate natural and community landscapes and to provide for the enjoyment and safety of the visiting public.

The plan will use the Standards for Rangeland Health and Guidelines for Grazing Management to ensure appropriate grazing practices are followed to protect monument values, watershed integrity, and habitats for plant and wildlife species on both BLM and NPS lands.

The plan will consider public input, interests, and values, past and present uses of public land and adjacent land, public benefits of providing goods and services, environmental impacts, social and economic values, public safety, and ecosystem restoration.

APPENDIX 1.F

NOTICE OF INTENT TO PREPARE RESOURCE MANAGEMENT PLANS AND PLAN REVISION

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

National Park Service

Federal Register: April 24, 2002 (Volume 67, Number 79; Pages 20155-20157)

AGENCY: Bureau of Land Management, Arizona Strip Field Office, St. George, Utah; National Park Service, Lake Mead National Recreation Area, Boulder City, Nevada.

ACTION: Notice of Intent to (1) prepare a Resource Management Plan (RMP) for the Grand Canyon Parashant National Monument, designated January 11, 2000, (2) prepare a RMP for the Vermilion Cliffs National Monument, designated November 9, 2000, and (3) revise the 1992 Arizona Strip RMP. These three actions will require a single Environmental Impact Statement (EIS). These lands are located in Mohave and Coconino Counties, Arizona.

SUMMARY: This document provides notice that the Bureau of Land Management (BLM) intends to prepare a RMP with an associated EIS for the Arizona Strip Field Office. BLM will work in cooperation with the National Park Service (NPS) for lands administered by the NPS Lake Mead National Recreation Area in the Grand Canyon Parashant National Monument. Separate plans will be developed for the Vermilion Cliffs National Monument and the Grand Canyon Parashant National Monument. This planning activity encompasses approximately 2,800,000 acres of public land, including 1,052,000 acres in the Grand Canyon Parashant Monument and 293,000 acres in the Vermilion Cliffs National Monument. The plan will fulfill the needs and obligations set forth by the National Environmental Policy Act (NEPA), the Federal Land Policy and Management Act (FLPMA), the National Park Service Organic Act, the Lake Mead National Recreation Area Enabling Legislation, the two monument proclamations, and the NPS and BLM management policies. The BLM will work closely with interested parties to identify the management decisions that are best suited to the needs of the public. This collaborative process will take into account local, regional, and national needs and concerns. This notice initiates the public scoping process to identify planning issues and to develop planning criteria. The scoping process will include an evaluation of the existing RMP in the context of the needs and interests of the public and protection of the objects of historic and scientific interest specified in the proclamations.

COMMENTS: Public meetings will be held throughout the plan scoping and preparation period. In order to ensure local community participation and input, public meeting locations will be rotated among towns, which could include St. George and Kanab, Utah; Flagstaff, Kingman, Page, and Phoenix, Arizona; and Mesquite and Las Vegas, Nevada. Early participation by all those interested is encouraged and will help determine the future management of the Grand Canyon Parashant and Vermilion Cliffs National Monuments and the Arizona Strip Field Office public lands. The publication of this notice will initiate the BLM and NPS scoping comment period. Scoping will last a minimum of 90 days. At least 15 days public notice will be given for activities where the public is invited to attend. Written comments will be accepted throughout the planning process at the addresses shown below. Meetings and comment deadlines will be announced through the local news media, newsletters and the BLM web site (www.az.blm.gov). In addition to the ongoing public participation process, formal opportunities for public participation will be provided through comment on the alternatives and upon publication of the joint BLM draft RMP/EIS and NPS draft General Management Plan (GMP)/EIS. Documents pertinent to this proposal may be examined at the Arizona Strip Field Office located in St. George, Utah. Comments, including names and street addresses of respondents, will be available for public review at the Arizona Strip Field Office located in

St. George, Utah, during regular business hours 7:45 a.m. to 4:15 p.m., Monday through Friday, except holidays, and may be published as part of the EIS. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be available for public inspection in their entirety.

ADDRESSES: For further information and/or to have your name added to our mailing list, contact Dennis Curtis, Telephone 435 688-3202, or Diana Hawks, Telephone 435 688-3266, Bureau of Land Management, Arizona Strip Field Office, 345 E. Riverside Drive, St. George, Utah 84790; Fax 435 688-3388; or Jim Holland, Telephone 702 293-8986, National Park Service, Lake Mead National Recreation Area, 601 Nevada Highway, Boulder City, Nevada 89005; Fax 702 293-8967.

SUPPLEMENTARY INFORMATION: The designation of Grand Canyon Parashant and Vermilion Cliffs National Monuments and the changing needs and interests of the public necessitates a revision of the Arizona Strip RMP, 1992, and Lake Mead National Recreation Area GMP, 1986. Two monument plans and a revised RMP for the remaining BLM Arizona Strip area will be combined into one planning effort. These actions require three separate Records of Decision (ROD) within a single EIS. Preliminary issues and management concerns have been identified by BLM and NPS personnel, other agencies, and in meetings with individuals and user groups. They represent BLM's and NPS's knowledge to date on the existing issues and concerns with current management. The major issue themes that will be addressed in the plan effort are: management and protection of public land resources, recreation/visitor use and safety; access and transportation on the public lands; integrating monument management with community, tribal, and other agency needs; and balancing multiple uses. After gathering public comments, the suggested issues will be placed in one of three categories:

1. Issues to be resolved in the plan.
2. Issues resolved through policy or administrative action.
3. Issues beyond the scope of this plan.

Rationale will be provided in the plan for each issue placed in category 2 or 3. In addition to the preceding major issues, management questions and concerns to be addressed in the plan include, but are not limited to: ecosystem health, riparian condition, threatened and endangered species habitat, wildlife habitat, reintroduction of native species, cultural resource protection and interpretation, recreation/visitor use, rangeland management, woodland product harvest, and minerals management. The following disciplines will be represented on the BLM/NPS planning team: wilderness, recreation, wildlife, range management, botany, fire ecology, forestry, geology, realty, cultural resources, soils, hydrology, Geographic Information Systems (GIS), and engineering. Where necessary and available, outside expertise will be used.

BACKGROUND INFORMATION: On January 11, 2000, the President signed Proclamation 7265, creating the Grand Canyon Parashant National Monument. The monument encompasses approximately 1,052,000 acres of public lands in Mohave County, Arizona. It borders Nevada to the west and Grand Canyon National Park to the south and BLM managed public lands to the east and north. The Vermilion Cliffs National Monument was established by Presidential Proclamation on November 9, 2000, and is under the administration of the BLM. The monument is located on the Colorado Plateau in northern Arizona. It borders the Kaibab National Forest to the west, Glen Canyon National Recreation Area to the east, and the state of Utah to the north.

The Grand Canyon Parashant National Monument proclamation states that the NPS and the BLM shall manage the monument cooperatively and shall prepare an agreement to share, consistent with applicable laws, whatever resources are necessary to properly manage the monument; however, the NPS shall continue to have primary management authority over the portion of the monument within the Lake Mead National Recreation Area, and the BLM shall have primary management authority over the remaining portion of the monument. The plan will need to address and incorporate, to the extent possible, NPS policies, regulations and management directives.

The Arizona Strip RMP was completed in 1992 and amended in 1998 to implement the Mohave Desert Tortoise Recovery Plan. Several significant multi-discipline plans have recently been completed, including the Mt. Trumbull Resource Conservation Area Plan in 1995 and the Parashant Resource Conservation Area Plan in 1997. The Lake Mead National Recreation Area GMP was completed in 1986, and the Shivwits portion of this plan was revised as part of Parashant Interdisciplinary Plan completed cooperatively by the two agencies in 1997. We anticipate incorporating much of the information in the existing plans into this plan revision.

Roger G. Taylor,
Arizona Strip Field Manager
William K. Dickinson,
Lake Mead National Recreation Area, Superintendent.
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BILLING CODE 4310-32-P

APPENDIX 2.A

ARIZONA STANDARDS AND GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT

Robert G. Taylor

Arizona State University

William K. Dickinson

Utah State University

Bill Dyer

ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION

INTRODUCTION

The Department of the Interior's final rule for Grazing Administration, issued on February 22, 1995, and effective August 21, 1995, requires that Bureau of Land Management (BLM) State Directors develop State or regional standards and guidelines for grazing administration in consultation with BLM Resource Advisory Councils (RAC), other agencies and the public. The final rule provides that fallback standards and guidelines be implemented, if State standards and guidelines are not developed by February 12, 1997. Arizona Standards and Guidelines and the final rule apply to grazing administration on public lands as indicated by the following quotation from the Federal Register, Volume 60, Number 35, page 9955.

"The fundamentals of rangeland health, guiding principles for standards and the fallback standards address ecological components that are affected by all uses of public rangelands, not just livestock grazing. However, the scope of this final rule, and therefore the fundamentals of rangeland health of §4180.1, and the standards and guidelines to be made effective under §4180.2, are limited to grazing administration."

Although the process of developing standards and guidelines applies to grazing administration, present rangeland health is the result of the interaction of many factors in addition to livestock grazing. Other contributing factors may include, but are not limited to, past land uses, land use restrictions, recreation, wildlife, rights-of-way, wild horses and burros, mining, fire, weather, and insects and disease.

With BLM's commitment to ecosystem and interdisciplinary resource management, the standards for rangeland health, as developed in this current process, will be incorporated into management goals and objectives. The standards and guidelines for rangeland health for grazing administration, however, are not the only considerations in resolving resource issues.

The following quotations from the Federal Register, Vol. 60, No. 35, page 9956, February 22, 1995, describe the purpose of standards and guidelines and their implementation:

"The guiding principles for standards and guidelines require that State or regional standards and guidelines address the basic components of healthy rangelands. The Department believes that by implementing grazing-related actions that are consistent with the fundamentals of §4180.1 and the guiding principles of §4180.2, the long-term health of public rangelands can be ensured.

Standards and guidelines will be implemented through terms and conditions of grazing permits, leases, and other authorizations, grazing-related portions of activity plans (including Allotment Management Plans), and through range improvement-related activities.

The Department anticipates that in most cases the standards and guidelines themselves will not be terms and conditions of various authorizations but that the terms and conditions will reflect the standards and guidelines.

The Department intends that assessments and corrective actions will be undertaken in priority order as determined by BLM.

"The Department will use a variety of data including monitoring records, assessments, and knowledge of the locale to assist in making the "significant progress" determination. It is anticipated that in many cases it will take numerous grazing seasons to determine direction and magnitude of trend. However, actions will be taken to establish significant progress toward conformance as soon as sufficient data are available to make informed changes in grazing practices."

FUNDAMENTALS AND DEFINITION OF RANGELAND HEALTH

The Grazing Administration Regulations, at §4180.1 (43 Code of Federal Regulation [CFR] 4180.1), Federal Register Vol. 60, No. 35, pg. 9970, direct that the authorized officer ensures that the following conditions of rangeland health exist:

(a) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

(c) Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives such as meeting wildlife needs.

(d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This Committee defined Rangeland Health ". . . as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." This committee emphasized ". . . the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The Committee also recommended that "The determination of whether a rangeland is healthy, at risk, or unhealthy should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

Standards describe conditions necessary to encourage proper functioning of ecological processes on specific ecological sites. An ecological site is the logical and practical ecosystem unit upon which to base an interpretation of rangeland health. Ecological site is defined as:

". . . a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management" (Journal of Range Management, 48:279, 1995). Ecological sites result from the interaction of climate, soils, and landform (slope, topographic position). The importance of this concept is that the "health" of different kinds of rangeland must be judged by standards specific to the potential of the ecological site. Acceptable erosion rates, water quality, productivity of plants and animals, and other features are different on each ecological site.

Since there is wide variation of ecological sites in Arizona, standards and guidelines covering these sites must be general. To make standards and guidelines too specific would reduce the ability of BLM and interested publics to select specific objectives, monitoring strategies, and grazing permit terms and conditions appropriate to specific land forms.

Ecological sites have the potential to support several different plant communities. Existing communities are the result of the combination of historical and recent uses and natural events. Management actions may be used to modify plant communities on a site. The desired plant community for a site is defined as follows: "Of the several plant communities that may occupy a site, the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum" (Journal of Range Management, 48:279, 1995).

Fundamentals (a) and (b) define physical and biological components of rangeland health and are consistent with the definition of rangeland health as defined by the Committee on Rangeland Classification, Board on Agriculture, National Research Council, as discussed in the paragraph above. These fundamentals provide the basis for sustainable rangelands.

Fundamentals (c) and (d) emphasize compliance with existing laws and regulation and, therefore, define social and political components of rangeland health. Compliance with Fundamentals (c) and (d) is accomplished by managing to attain a specific plant community and associated wildlife species present on ecological sites. These desired plant communities are determined in the BLM planning process, or, where the desired plant community is not identified, a community may be selected that will meet the conditions of Fundamentals (a) and (b) and also adhere to laws and regulations. Arizona Standard 3 is written to comply with Fundamentals (c) and (d) and provide a logical combination of Standards and Guidelines for planning and management purposes.

STANDARD AND GUIDELINE DEFINITIONS

Standards are goals for the desired condition of the biological and physical components and characteristics of rangelands. Standards:

- (1) are measurable and attainable; and
- (2) comply with various Federal and State statutes, policies, and directives applicable to BLM Rangelands.

Guidelines are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

- (1) typically identify and prescribe methods of influencing or controlling specific public land uses;
- (2) are developed and applied consistent with the desired condition and within site capability; and
- (3) may be adjusted over time.

IMPLEMENTING STANDARDS AND GUIDELINES

The authorized officer will review existing permitted livestock use, allotment management plans, or other activity plans which identify terms and conditions for management on public land. Existing management practices and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet, or are making significant progress toward meeting, the standards and are in conformance with the guidelines. The review will be interdisciplinary and conducted under existing rules which provide for cooperation, coordination, and consultation with affected individuals, federal, state, and local agencies, tribal governments, private landowners, and interested publics.

This review will use a variety of data, including monitoring records, assessments, and knowledge of the locale to assist in making the significant progress determination. Significance will be determined on a case by case basis, considering site potential, site condition, weather and financial commitment. It is anticipated there will be cases where numerous years will be needed to determine direction and magnitude of trend.

Upon completion of review, the authorized officer shall take appropriate action as soon as practicable but no later than the start of the next grazing year upon determining that the existing grazing management practices or level of use on public land are significant factors contributing to failure to achieve the standards and conform with the guidelines that are made effective under 43 CFR 4180.2. Appropriate action means implementing actions that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with guidelines.

Livestock grazing will continue where significant progress toward meeting standards is being made. Additional activities and practices would not be needed on such allotments. Where new activities or practices are required to assure significant progress toward meeting standards, livestock grazing use can continue contingent upon determinations from monitoring data that the implemented actions are effective in making significant progress toward meeting the standards. In some cases, additional action may be needed as determined by monitoring data over time.

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

ARIZONA STANDARDS AND GUIDELINES

Arizona Standards and Guidelines (S&G) for grazing administration have been developed through a collaborative process involving the Bureau of Land Management State S&G Team and the Arizona Resource Advisory Council. Together, through meetings, conference calls, correspondence, and Open Houses with the public, the BLM State Team and RAC prepared Standards and Guidelines to address the minimum requirements outlined in the grazing regulations. The Standards and Guidelines, criteria for meeting Standards, and indicators are an integrated document that conforms to the fundamentals of rangeland health and the requirements of the regulations when taken as a whole.

Upland sites, riparian-wetland areas, and desired resource conditions are each addressed by a standard and associated guideline.

Standard 1: Upland Sites

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).

Criteria for meeting Standard 1:

Soil conditions support proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including appropriate amounts of vegetative cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the potential of the site.

Ground cover in the form of plants, litter or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

As indicated by such factors as:

Ground Cover

litter

live vegetation, amount and type (e.g., grass, shrubs, trees, etc.)

rock

Signs of erosion

flow pattern

gullies

rills

plant pedestaling

Exceptions and exemptions (where applicable):

None

Guidelines:

1-1. Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological

sites within management units. The ground cover should maintain soil organisms and plants and animals to support the hydrologic and nutrient cycles, and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

1-2. When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

Standard 2: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

Criteria for meeting Standard 2:

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large woody debris is present to dissipate stream energy associated with high water flows.

Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetative, soil and erosion-deposition factors. BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as indicated by the results of the application of the appropriate checklist.

The checklist for riparian areas is in Technical Reference 1737-9 "Process for Assessing Proper Functioning Condition." The checklist for wetlands is in Technical Reference 1737-11 "Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas." These checklists are reprinted on the pages following the Guidelines for Standard 3.

As indicated by such factors as:

- Gradient
- Width/depth ratio
- Channel roughness and sinuosity of stream channel
- Bank stabilization
- Reduced erosion
- Captured sediment
- Ground-water recharge
- Dissipation of energy by vegetation

Exceptions and exemptions (where applicable):

Dirt tanks, wells, and other water facilities constructed or placed at a location for the purpose of providing water for livestock and/or wildlife and which have not been determined through local planning efforts to provide for riparian or wetland habitat are exempt.

Water impoundments permitted for construction, mining, or other similar activities are exempt.

Guidelines:

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.

2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

2-3. The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

Standard 3: Desired Resource Conditions

Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

Criteria for meeting Standard 3:

Upland and riparian-wetland plant communities meet desired plant community objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species, and the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and appropriate laws, regulations, and policies.

Desired plant community objectives will be developed to assure that soil conditions and ecosystem function described in Standards 1 and 2 are met. They detail a site-specific plant community, which when obtained, will assure rangeland health, State water quality standards, and habitat for endangered, threatened, and sensitive species. Thus, desired plant community objectives will be used as an indicator of ecosystem function and rangeland health.

As indicated by such factors as:

Composition
Structure
Distribution

Exceptions and exemptions (where applicable):

Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical.

Guidelines:

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

3-2. Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance or restoration of their habitats.

3-3. Management practices maintain, restore, or enhance water quality in conformance with State or Federal standards.

3-4. Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant community objectives.

3-5. Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;

sufficient surface and subsurface soil moisture exists for continued plant growth;

serviceable waters are capable of providing for proper grazing distribution;

sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and

monitoring is conducted during grazing to determine if objectives are being met.

3-6. Management practices will target those populations of noxious weeds which can be controlled or eliminated by approved methods.

3-7. Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites and plants of significance to Native American peoples.

STANDARDS AND GUIDELINES ON THE ARIZONA STRIP DISTRICT

The Standards were written by Arizona's Resource Advisory Council (RAC) in 1997. They were accepted and approved that same year by the Secretary of the Interior. The Guidelines apply only to authorized livestock grazing activities, the Standards apply to all programs and all authorized activities. The process of implementing the Standards on all grazing allotments on the Arizona Strip is performed by two teams. The Interdisciplinary Assessment Team (IAT) is made up of resource specialists from the BLM, Arizona Game and Fish Department, the Natural Resources Conservation Service and Mohave County Extension Agency. This team carries out the assessment. The Arizona Resource Advisory Council appointed a nine member Rangeland Resource Team (RRT), to be involved in the process from beginning to end.

- The RRT is constructed similar to the RAC with 3 representatives in each of 3 diverse groups:
 1. Commodities: Livestock Grazing, Mining, Commercial Recreation
 2. Non-Commodities: Wildlife, Environmental, Dispersed Recreation
 3. Local Area Interest: Public-at-large, Native American Interests, Elected Officials
- The RRT has 2 objectives:
 1. Ensure the Standards are consistently applied across allotment boundaries, and
 2. Ensure determinations are based on something..., monitoring data, professional opinion.

There is a list of members on both teams below.

Each year letters are sent to approximately 700 individuals notifying them which grazing allotments are to be evaluated in the upcoming fiscal year. The recipient is then instructed how to request designation as an "Interested Public" and be involved in the evaluation and decision making process.

BLM grazing regulations at 43CFR 4100.0-5 state "Interested public means an individual, group or organization that has **submitted a written request** to the authorized officer to be provided an opportunity to be involved in the decision making process for the management of livestock grazing on **specific grazing allotments** or has submitted written comments to the authorized officer regarding the management of livestock grazing on a specific allotment"(emphasis added).

The Arizona Strip District holds an issue scoping meeting once a year, where all issues raised are documented as either relating, or not relating, to rangeland health. During the year each allotment with issues that relate to rangeland health is visited, after assembling all available information and monitoring data. Both teams visit sites representing each issue and the IAT determines, by consensus, whether the area is meeting standards. The interested public is invited to the scoping meetings and the field visits. If an area does not meet the standards, the cause is determined and recommendations are made to improve the situation. If the current livestock grazing practices are determined to be the cause of non-attainment, BLM regulations (43 CFR 4180.1) require the modification of the practices by the next grazing season.

The IAT then produces a report documenting the results of the evaluation. The S&G report is sent to the RAC, the RRT, State Agencies having lands or managing resources within the area, and the Interested Public. Any comments received are used in the preparation of an Environmental Assessment for renewing the ten year grazing permit. A Grazing Decision is then issued to the Permittee, State Agencies having lands or managing resources within the area, and the Interested Public. This grazing decision outlines the terms and conditions of the grazing permit and may be protested or appealed by any or all recipients.

APPENDIX 2.B

NOMINATION, EVALUATION, AND DESIGNATION OF SIGNIFICANT CAVES

NOMINATION, EVALUATION, AND DESIGNATION OF SIGNIFICANT CAVES**From the Code of Federal Regulations (CFR) 43 Part 37.11**

- (a) Nominations for initial and subsequent listings. The authorized officer will give governmental agencies and the public, including those who utilize caves for scientific, educational, and recreational purposes, the opportunity to nominate potential significant caves. The authorized officer will give public notice, including a notice published in the Federal Register, calling for nominations for the initial listing, including procedures for preparing and submitting the nominations. Nominations for subsequent listings will be accepted from governmental agencies and the public by the agency that manages the land where the cave is located as new cave discoveries are made or as new information becomes available. Nominations not approved for designation during the listing process may be resubmitted if better documentation or new information becomes available.
- (b) Evaluation for initial and subsequent listings. The evaluation of the nominations for significant caves will be carried out in consultation with individuals and organizations interested in the management and use of cave resources, within the limits imposed by the confidentiality provisions of Sec. 37.12 of this part. Nominations will be evaluated using the criteria in Sec. 37.11(c).
- (c) Criteria for significant caves. A significant cave on Federal lands shall possess one or more of the following features, characteristics, or values.
- (1) Biota. The cave provides seasonal or yearlong habitat for organisms or animals, or contains species or subspecies of flora or fauna that are native to caves, or are sensitive to disturbance, or are found on State or Federal sensitive, threatened, or endangered species lists.
 - (2) Cultural. The cave contains historic properties or archaeological resources (as described in 36 CFR 60.4 and 43 CFR 7.3) or other features that are included in or eligible for inclusion in the National Register of Historic Places because of their research importance for history or prehistory, historical associations, or other historical or traditional significance.
 - (3) Geologic/Mineralogic/Paleontologic. The cave possesses one or more of the following features:
 - (i) Geologic or mineralogic features that are fragile, or that exhibit interesting formation processes, or that are otherwise useful for study.
 - (ii) Deposits of sediments or features useful for evaluating past events.
 - (iii) Paleontologic resources with potential to contribute useful educational and scientific information.

(4) Hydrologic. The cave is a part of a hydrologic system or contains water that is important to humans, biota, or development of cave resources.

(5) Recreational. The cave provides or could provide recreational opportunities or scenic values.

(6) Educational or Scientific. The cave offers opportunities for educational or scientific use; or, the cave is virtually in a pristine state, lacking evidence of contemporary human disturbance or impact; or, the length, volume, total depth, pit depth, height, or similar measurements are notable.

(d) National Park Service policy. The policy of the National Park Service, pursuant to its Organic Act of 1916 (16 U.S.C. 1, et seq.) and Management Policies (Chapter 4:20, Dec. 1988), is that all caves are afforded protection and will be managed in compliance with approved resource management plans. Accordingly, all caves on National Park Service-administered lands are deemed to fall within the definition of "significant cave."

(e) Special management areas. Within special management areas that are designated wholly or in part due to cave resources found therein, all caves within the so-designated special management area shall be determined to be significant.

(f) Designation and documentation. If the authorized officer determines that a cave nominated and evaluated under paragraphs (a) and (b) of this section meets one or more of the criteria in paragraph (c), the authorized officer will designate the cave as significant. The authorized officer will designate all caves identified in paragraphs (d) and (e) of this section to be significant. The authorized officer will notify the nominating party of the results of the evaluation and designation. Each agency Field Office will retain appropriate documentation for all significant caves located within its administrative boundaries. At a minimum, documentation shall include a statement of finding signed and dated by the authorized officer, and the information used to make the determination. This documentation will be retained as a permanent record in accordance with the confidentiality provision in Sec. 37.12 of this part.

(g) Decision final. Decisions to designate or not designate a cave as significant are made at the sole discretion of the authorized officer and are not subject to further administrative review or appeal under 43 CFR Part 4.

(h) If a cave is determined to be significant, its entire extent, including passages not mapped or discovered at the time of the determination, is deemed significant. This includes caves that extend from lands managed by any Federal agency into lands managed by one or more other bureaus or agencies of the Department of the Interior, as well as caves initially believed to be separate for which interconnecting passages are discovered after significance is determined.

APPENDIX 2.C

VEGETATION TREATMENT TOOLS AND METHODS

The following table provides a comprehensive overview of the various tools and methods used in vegetation treatment. It is organized into two main sections: Mechanical and Chemical. Each section lists the tool or method, its primary application, and any specific considerations or limitations.

Mechanical Methods:

- Hand Tools:** Used for small-scale, targeted treatments. Includes tools like axes, chainsaws, and brush cutters.
- Skid Steer Loaders:** Versatile machines used for clearing brush, mowing, and light grading. Often equipped with various attachments.
- Backhoes:** Used for digging stumps, creating firebreaks, and clearing areas with dense vegetation.
- Excavators:** Employed for large-scale clearing, stump removal, and creating access roads in rugged terrain.
- Graders:** Used for leveling ground, creating firebreaks, and maintaining access roads.
- Mowers:** Used for maintaining firebreaks and clearing brush in open areas.
- Chippers:** Used to process brush and small trees into mulch, which can be used for soil enrichment or as a mulch layer.
- Stump Pullers:** Specialized equipment used for the efficient removal of large tree stumps.

Chemical Methods:

- Herbicides:** Used to control unwanted vegetation, often applied as a pre-treatment to reduce the amount of mechanical work required.
- Prescribed Burns:** A controlled fire used to manage vegetation, reduce fuel loads, and promote the growth of fire-resistant species.
- Soil Treatments:** Used to alter soil conditions, such as applying lime to raise pH or sulfur to lower it, to favor certain plant species.

The selection of a specific tool or method depends on the site conditions, the type of vegetation to be treated, and the desired outcome. Often, a combination of mechanical and chemical methods is used to achieve the most effective results.

Vegetation Treatment Tools and Methods

This appendix briefly describes a variety of vegetation treatment tools and methods that may be used in the BLM lands of the Planning Area. Included are recommendations for uses of the various tools and methods, as well as the advantages and disadvantages of each. At the end of this section is an addendum that applies specifically to NPS lands within the Parashant.

Manual

In manual treatments, plants are cut at or above ground level; plant root systems are pulled or dug out to prevent subsequent sprouting and regrowth; or mulch is placed around desired vegetation to limit the growth of competing vegetation. Hand tools and hand-operated power tools are used in manual vegetation treatments to cut, clear, or prune herbaceous and woody species. Hand tools such as the handsaw, axe, shovel, rake, machete, grubbing hoe, mattock (combination of axe and grubbing hoe), brush hook, and hand clippers, etc. are used in manual treatments. Axes, shovels, grubbing hoes, and mattocks can dig up and cut below the surface to remove the main root of plants such as prickly pear and mesquite that have roots which can quickly resprout in response to surface cutting or clearing. Power tools, such as chain saws and power brush saws, are used to sever the main stem of woody vegetation at or near ground level.

The advantage of manual treatments is that they are species and individual plant specific, can be used in sensitive habitats, and can be used in areas inaccessible for mechanical treatments. The disadvantage is that they are labor intensive and, therefore, expensive.

Mechanical

Mechanical treatments are used to kill or reduce the cover of undesirable vegetation and thus encourage the growth of desirable vegetation. Several different types of mechanical equipment are effective in suppressing, inhibiting, or controlling herbaceous and woody vegetation (Vallentine 1980). Equipment could include wheeled or track type tractors, mowers, shredders, ATV's or specially designed vehicles with attached implements for mechanical vegetation treatments. The best mechanical method for treating undesired plants in a particular location depends on the following factors:

1. Characteristics of the undesired species present such as plant density stem size, woodiness, brittleness, and re-sprouting ability;
2. Need for seedbed preparation and/or re-vegetation,
3. Need to reduce erosion and improve effective ground cover,
4. Soil characteristics such as type, depth, amount and size of rocks, erosion potential, and susceptibility to compaction;
5. Climatic and seasonal conditions,
6. Topography and terrain,
7. Potential cost of project compared to expected results, and
8. Vegetation type.

Wheeled or crawler tractors can uproot and/or push vegetation over (bulldozing) with a heavy, hydraulic controlled blade. Vegetation is either left scattered or pushed into windrows or piles. There are several different kinds of blades available, depending of the type of vegetation and goals of the project. Bulldozing is most effective in removing scattered large brush or trees. Soil disturbance is a disadvantage of bulldozing.

Disk plowing in various forms can be used for removing shallow-rooted herbaceous and woody plants. Several different kinds of root plows are specific for certain types of vegetation. In addition to killing vegetation, disk plowing is effective in loosening the soil surface to prepare it for seeding and to improve the rate of water infiltration. The disadvantages of disk plowing are that it disturbs the soil and provides an opportunity for an increase in invasive non-native plants, it usually kills all species, and it may be expensive. Also, plowing is usually not practical on steep (greater than a 35% to 45% slope) or rocky slopes. Plant species that sprout from roots may survive.

Various tractor attachments are used for mowing, beating, crushing, chopping, or shredding vegetation depending on the nature of the vegetation and goals of the project. Mowing is effective in reducing plant height and usually does not kill vegetation. Mowing is more effective on herbaceous than woody vegetation. On the other hand, a rolling cutter may kill woody non-sprouting vegetation by breaking stems at ground level but leaving herbaceous vegetation. Generally, mowing, beating, crushing, chopping, or shredding disturbs the soil surface minimally. Rocky soil and steep slopes may limit use of this type of equipment. The advantage of using this type of equipment is that selective plants may be targeted to achieve specific goals.

Chaining and cabling are used to remove non-sprouting woody vegetation such as small trees and shrubs by pulling them over. Vegetation removal is accomplished by dragging heavy anchor chains or steel cables, hooked behind two tractors, in a U-shaped manner. Vegetation is either left scattered or pushed into windrows or piles. The chains or cables can also be used to prepare the soil surface for seeding desirable species and to cover seed with soil to improve germination. Although herbaceous vegetation is not normally injured during the treatment, desirable shrubs may be damaged. The disadvantage of this treatment is soil disturbance and that non-desirable "weedy" herbaceous vegetation can survive this treatment. This vegetation treatment method is cost effective as large areas can be readily treated.

Chemical

Until the new Vegetation Management EIS is approved (2004), BLM will use EPA-approved herbicides in accordance with EPA's Endangered Species Pesticide Program covered in the BLM's *Vegetation Treatment on BLM Lands in Thirteen Western States FEIS* (May 1991) and to those approved for use by the Arizona Record of Decision (Page 3, ROD, July 1991). These herbicides are: Atrazine; Bromacil; Bromacil + Diuron; Chlorsulfuron; Clopyralid; 2,4-D, Dicamba; Dicamba + 2,4-D; Diuron; Glyphosate; Glyphosate + 2,4-D; Hexazinone; Imazapyr; Mefluidide; Metsulfuron Methyl; Picloram; Picloram + 2,4-D; Simazine; Sulfometuron Methyl; Tebuthiuron; and Triclopyr as listed on pages 1-19 through 1-32 and project design features listed on pages 1-33 through 1-37 of the FEIS. Once the new ROD for this RMP is signed, BLM will adhere to the standards and guidelines for each approved herbicide set forth in that FEIS.

Herbicide applications are designed to minimize potential impacts on non-target plants and animals, while achieving the objective of the vegetation treatment project. The rates of application depend on the target species, presence and condition of non-target vegetation, soil type, depth to the water table, presence of other water sources, and the requirements of the label. In many circumstances the herbicide chosen, time of treatment, and rate of application of the herbicide is different than the most ideal herbicide application for maximum control of the target plant species in order to minimize damage to the non-target plant species, and to ensure minimum risk to human health and safety.

The herbicides may be applied aurally with helicopters or fixed-wing aircraft, or on the ground using vehicles or manual application devices. Helicopters are more expensive than fixed-wing aircraft, but they are more effective in irregular terrain and in treating specific target vegetation in areas with many vegetation types. Manual applications are generally used for treating small areas or those inaccessible by vehicle.

BLM will work closely with the FWS to ensure that herbicide applications will not affect listed or proposed threatened or endangered species on a project-level basis. If adverse effects are anticipated during informal consultation, then BLM will formally consult on these projects. If FWS develops herbicide guidance for particular species that improves protection beyond the current BLM design features, BLM will consider and incorporate that guidance as it consults with the FWS on a project-level basis. In order to protect listed, proposed, and candidate species, buffer strips may be used.

Project design features may include buffer strips described on page 10 of the ROD, as follows: "Buffer strips would be used adjacent to dwellings, domestic water sources, agriculture land, streams, lakes, and ponds. A minimum buffer strip 100 feet wide will be provided for aerial application, 25 feet for vehicle application and 10 feet for hand application. Any deviations must be in accordance with the label for the herbicide. Herbicides could be wiped on individual plants within 10 feet of water where application is critical." (It should be noted that the new Draft Vegetation Management EIS contains herbicides approved for application over water, and therefore buffer strips may not always be necessary, once the new FEIS is approved.)

The chemicals can be applied by many different methods and the selected technique depends on a number of variables. Some of these are:

1. treatment objective (removal or reduction);
2. accessibility, topography, and size of the treatment area;
3. characteristics of the target species and the desired vegetation;
4. location of sensitive areas in the immediate vicinity (potential environmental impacts);
5. anticipated costs and equipment limitations; and
6. meteorological and vegetative conditions of the treatment area at the time of treatment.

The changes made here are not consistent with the format of the numbered items under the "Mechanical Section." Chemical treatments are generally cost effective and can be species specific. The disadvantages are they are not always species specific and precautions may need to be taken to ensure attainment of treatment objectives.

Biological

Biological control (biocontrol) is the intentional use of living organisms to reduce the population of a pest. It may include the use of insects, nematodes, mite, plant pathogens, and vertebrates. The majority of the noxious weeds in the United States are introduced without their natural enemies. Biocontrol seeks to use some of the native land's biotic factors to suppress populations of these undesirable plants. (Biological Control of Weeds in the West, Western Society of Weed Management, 1996). The eventual impacts of a biocontrol agent on its target plant will be the result of the:

1. density of weeds compared to the density of the agent;
2. effect of the local biotic and abiotic conditions on the agent and on the weed;
3. plant's reproductive ability (seeds only or seeds and vegetative reproduction);
4. agent's ability to stress the plant each year and the plant's ability to maintain and replace root reserves;
5. plant's ability to recover from the effects of the biocontrol agent, and;
6. interactions of multiple biocontrol agents attacking a single weed species.

The changes made here are not consistent with the format of the numbered items under the "Mechanical Section"

The advantages of biocontrol:

1. Once a biocontrol agent becomes established it usually will reproduce, increase its numbers, and continue to attack the target organism, generally without additional costs to the land manager.
2. Biocontrol agents move to host plants anywhere within their climatic range, readily crossing ownership boundaries and some geographical barriers.
3. Approved biocontrol agents are selective – host weeds are attacked without damage to the surrounding vegetation.
4. Properly tested biocontrol agents are not a source of environmental contamination.

The disadvantages of biocontrol:

1. It often takes many years for the populations of the introduced agents to increase to levels that permanently decrease the pest plant population.
2. Some biocontrol agents may be subject to predators.
3. Environmental conditions (shade versus sun, low versus high rainfall, sandy versus clay soils) often exclude some biocontrol agents from certain locations.
4. Biocontrol agents usually do not eradicate weed populations.

Cattle, sheep and goats are domestic animals which can be used as biological agents to control the top growth of certain noxious weeds. The use of grazing as a biological control agent would be conducted in accordance with BLM procedures in the Use of Biological Control Agents of Pests on Public Lands (BLM 1990). The following are some advantages of using domestic animals, mainly sheep or goats, for noxious weed control.

1. They use weeds as a food source.
2. Following a brief adjustment period, they sometimes consume as much as 50 percent of their daily diet of targeted species.
3. Sheep or goats can be used in combination with herbicides.

Some of the disadvantages of using domestic animals are:

1. They also use non-target plants as food sources.
2. The use of domestic animals, like sheep or goats, requires a herder or temporary fencing.
3. The animals may be killed by predators such as coyotes.
4. Most weed species are less palatable than desirable vegetation.
5. They may accelerate movement of nonnative plants through seed ingestion and excretion.
6. They control few, if any, plant species.
7. Domestic livestock may transmit parasites and/or pathogens to resident native wildlife species.

Wildland Fire Use and Prescribed Fire

Wildland Fire Use

Wildland fire use is wildland fire used to protect, maintain, and enhance resources and, when possible, allowed to function in its natural ecological role. Use of fire will be based on approved Fire Management Plans and will follow specific prescriptions contained in operational plans.

The Interagency Standards for Fire and Fire Aviation Operations (2004) will be followed. It includes the following incident management guidance for wildland fire use:

1. Agencies may apply this strategy in managing wildland fires for resource benefit.
2. An approved Fire Management Plan (FMP) is required. This plan identifies specific resource and fire management objectives, a predefined geographic area, and prescriptive criteria that must be met.
3. A Wildland Fire Implementation Plan (WFIP) will be completed for all wildland fires that are managed for resource benefit. This is an operational plan for assessing, analyzing, and selecting strategies for wildland fire use. It is progressively developed and documents appropriate management responses for any wildland fire managed for resource benefits. The plan will be completed in compliance with the guidance found in the Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide (August 1998).
4. Monitoring and Evaluation includes assessment and long term monitoring of the fire treatment to ensure the prescribed fire has met the objectives of the approved prescribed fire plan.

Prescribed Fire

Prescribed fire is the planned application of fire to vegetation, under specific conditions of fuels, weather, and other variables, to ensure the fire remains in a predetermined area and achieves site-specific resource management objectives. Prescribed fire treatments would be implemented in accordance with BLM procedures in Fire Planning (BLM 1987c), Prescribed Fire Management (BLM 1988b), and Fire Training and Qualifications (BLM 1987d).

Prior to conducting a prescribed burn, a written plan must be prepared that takes into consideration existing conditions (amount of fuel, fuel moisture, temperatures, terrain, weather forecasts, etc.) and identifies people responsible for overseeing the fire.

Seeding

Following vegetation management treatments, seed may be applied. All seed will be tested and “state certified” free of weed seeds. Seed priming, covering, and other enhancement techniques may be used to increase germination rates. Seeding encourages development of a desired plant community, mitigates erosion, establishes effective ground cover, and/or encourages development of desirable wildlife habitat attributes. The disadvantages of seeding are that acquiring and applying seed is expensive and germination is not always successful.

NPS Vegetation Treatment Tools and Methods

On NPS lands, individual restoration plans will be prepared, and compliance conducted, for each restoration project. Tools that may be considered include;

- Manual – as written for BLM lands, including chain saws and power brush saws.
- Chemical – as written for BLM lands, except NPS will use EPA and NPS approved pesticides in accordance with NPS Integrated Pest Management (IPM) Policy and Guidelines
- Biological – as written for BLM lands, except the use of cattle, sheep, and goats. NPS use will be in accordance with NPS IPM Policy and Guidelines
- Fire – as written for BLM lands, except in accordance with NPS policies.
- Seeding – As written for BLM, except only native species will be applied to NPS lands in accordance with NPS policies.
- Mechanical -- As written for BLM, except no disk plowing, chaining or cabling will be used on NPS lands. Appropriateness of the tool and method may be required on a project-to-project basis.

All treatments will be consistent with NPS laws, regulations, and policies. The minimum requirement process will be conducted for administrative activities on NPS proposed wilderness.

**Standards for Rangeland Health
Evaluation Results and Evaluation Schedule**

Resource Area: Arizona Strip Field Office AZ110

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Antelope	05206	Progressing Towards Meeting
Antelope Spring	05210	Meeting
Atkin Well	05207	2005
Badger Creek	05341	Progressing Towards Meeting
Beanhole Well	05334	Progressing Towards Meeting
Beaver Dam Slope	04828	2008
Black Canyon	05256	Meeting
Black Knolls	05264	2005
Black Rock	04841	Evaluation in Draft
Blake Pond	04813	2006
Brown-Shumway	05302	Evaluation in Draft
Button	05308	Evaluation in Draft
Canaan Gap	05205	2005
Cane Beds	05212	Evaluation in Draft
Cedar Knoll	05318	Evaluation in Draft
Cedar Pockets Ut	04866	2007
Cedar Ridge	05303	Evaluation in Draft
Cedar Wash	04842	2005
Chatterly	05307	Evaluation in Draft
Clay Spring	04845	Evaluation in Draft
Clayhole	05215	2005
Cottonwood	05209	2005
Cowboy Butte	05310	Evaluation in Draft
Coyote	05327	Evaluation in Draft
Coyote Spring	04805	Evaluation in Draft
Crosby Tank	05219	2006
Diamond Butte	04833	Evaluation in Draft
Fern Tank	05217	Evaluation in Draft
Ferrin	05246	Evaluation in Draft
Flat Top Well	05214	Meeting
Franks Reservoir	05325	Evaluation in Draft
Fuller Road	05324	Evaluation in Draft
Glazier Dam	05202	Evaluation in Draft
Gramma Point	05233	Evaluation in Draft
Gramma Spring	05225	Evaluation in Draft
Gulch	05230	Evaluation in Draft

Resource Area: Arizona Strip Field Office AZ110

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Gunsight	05320	Evaluation in Draft
Hacks	05227	Meeting
Harris Well	05238	2006
Hat Knoll	04867	Evaluation in Draft
Head of Hacks	05232	Evaluation in Draft
Herd House	00096	Evaluation in Draft
Highway	04812	2007
Highway	05309	Evaluation in Draft
Homestead	05253	Meeting
House Rock	05331	Progressing Towards Meeting
Hurricane Cliff	05251	Evaluation in Draft
Hurricane Rim	00114	Progressing Towards Meeting
Ivanpah	04858	Evaluation in Draft
Iverson	04834	Meeting
Jackson Tank	04830	2005
Jacob Canyon	05317	2005
Joe	05245	Evaluation in Draft
Johnson Run	05330	Evaluation in Draft
June Tank	05221	Progressing Towards Meeting
Kanab Creek	05321	2007
Kanab Gulch	05224	Evaluation in Draft
Lamb Tank	05257	Evaluation in Draft
Lambing-Starvation	04838	Meeting
Lane	05271	Evaluation in Draft
Lime Spring	02012	2008
Little Tank	04853	Evaluation in Draft
Little Wolf	04814	Evaluation in Draft
Littlefield	04843	2008
Littlefield Comm.	04827	2008
Lizard	04857	2006
Loco Point	05260	Evaluation in Draft
Lost Spring Gap	05316	Evaluation in Draft
Lower Hurricane	04837	Evaluation in Draft
Mainstreet	04808	Evaluation in Draft
Mesquite Community	04832	2008
Moonshine	05237	Meeting
Mormon Well	04844	2008
Mountain Sheep	04824	Meeting
Mud And Cane Spring	04850	Evaluation in Draft
Muggins Flat	05313	Evaluation in Draft

Resource Area: Arizona Strip Field Office AZ110

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Mustang Spring	04859	Meeting
Navajo Wells Ut	05348	Evaluation in Draft
Pat's Pond	04862	2005
Pigeon Tank	05322	2007
Pipe Valley	05242	Progressing towards Meeting
Pocum	04871	Evaluation in Draft
Pocum Tank	04840	Evaluation in Draft
Point of Rock	05241	Evaluation in Draft
Pratt Tank	05314	Evaluation in Draft
Purgatory	04831	Meeting
Quail Canyon	04856	Progressing Towards Meeting
Rider	05305	Meeting
Rock Canyon	00099	Evaluation in Draft
Rock Canyon Tank	05319	Evaluation in Draft
Rock Pockets	05213	Evaluation in Draft
Rock Reservoir	05345	Evaluation in Draft
Sage	05311	2005
Scotties Seep	05236	2005
Shinarump	05301	Meeting
Short Creek	05270	2005
Shuttleworth	05315	Evaluation in Draft
Soap Creek	05332	Progressing Towards Meeting
State Line	05244	Evaluation in Draft
Suicide	05323	Evaluation in Draft
Sullivan Canyon	04810	Evaluation in Draft
Sunshine	04863	Evaluation in Draft
Sunshine Tank	05247	2006
Swapp Tank	05248	2006
Temple Trail	05216	Progressing Towards Meeting
Toquer Tank	04861	2006
Tuckup	00097	Progressing Towards Meeting
Valley Wash	05234	Progressing Towards Meeting
Wells	05208	Evaluation in Draft
White Pockets	05243	Meeting
White Sage	05349	2007
Whiterock-Soapstone	04804	Evaluation in Draft
Wildband	05223	2005
Wolfhole Canyon Sp	04811	2006
Wolfhole Lake	04823	2006
Wolfhole Mountain	04839	Meeting
Yellowstone	05263	2005

Resource Area: *Vermilion NM AZ120*

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Bunting Well	04847	2005
Ferry Swale	05336	Evaluation in Draft
Sand Hills	05328	2005
Signature Rock	05350	Evaluation in Draft
Wahweap	05340	Evaluation in Draft

Resource Area: Parashant NM AZ130

Allotment Name	Allotment Number	Evaluation Result or FY Scheduled
Belnap	04849	Meeting
Belnap West	04822	Meeting
Big Spring Pipeline	04870	Evaluation in Draft
Cottonwood	04809	2005
Duncan Tank	04820	Evaluation in Draft
Hidden Hills	04825	2008
Hidden Spring	04803	Evaluation in Draft
Imlay	04817	Evaluation in Draft
Jump Canyon	04801	Evaluation in Draft
Last Chance	04815	Evaluation in Draft
Link Spring	04819	Evaluation in Draft
Mosby	04835	2008
Mosby-Nay	04836	2008
Mt Trumbull	04826	Meeting
Mt. Logan	05218	2005
Pakoon	04802	2008
Pakoon Springs	04800	2008
Penns Well	04852	Meeting
Red Pond	04806	2005
Sullivan Tank	04816	Evaluation in Draft
Tuweep	05220	Progressing Towards Meeting
Wildcat	04854	2005

APPENDIX 2.E

CONSERVATION MEASURES FOR SPECIAL STATUS SPECIES

CONSERVATION MEASURES FOR SPECIAL STATUS SPECIES

The following Conservation Measures be implemented as part of the proposed action for all management activities authorized. These Conservation Measures are intended to provide District-wide consistency in reducing or eliminating the effects of management actions on Federally endangered, threatened, proposed, and candidate species, as well as species included on the Wildlife Species of Concern in Arizona and BLM Arizona Sensitive Species lists.

1.0 Conservation Measures for Fire Management Activities

1.1 Wildland Fire Suppression (FS)

The following Conservation Measures would be implemented during fire suppression operations, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Each Conservation Measure has been given an alphanumeric designation for organizational purposes (*e.g.*, FS-1). Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations would be documented by the Resource Advisor, and coordinated with the USFWS.

- FS-1** Protect known locations of habitat occupied by Federally listed species. Minimum Impact Suppression Tactics (M.I.S.T.) would be followed in all areas with known Federally protected species or habitat.
- FS-2** Resource Advisors would be designated to coordinate natural resource concerns, including Federally protected species. They would also serve as a field contact representative (FCR) responsible for coordination with the USFWS. Duties would include identifying protective measures endorsed by the Field Office Manager, and delivering these measures to the Incident Commander; surveying prospective campsites, aircraft landing and fueling sites; and performing other duties necessary to ensure adverse effects to Federally protected species and their habitats are minimized. On-the-ground monitors would be designated and used when fire suppression activities occur within identified occupied or suitable habitat for Federally protected species.
- FS-3** All personnel on the fire (firefighters and support personnel) would be briefed and educated by Resource Advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel would be informed of the conservation measures designed to minimize or eliminate take of the species present. This information is best identified in the incident objectives.
- FS-4** Permanent road construction would not be permitted during fire suppression activities in habitat occupied by Federally protected species. Construction of temporary roads is approved only if necessary for safety or the protection of property or resources, including Federally protected species habitat. Temporary road construction should be coordinated with the USFWS, through the Resource Advisor.

- FS-5** Crew camps, equipment staging areas, and aircraft landing and fueling areas should be located outside of listed species habitats, and preferably in locations that are disturbed. If camps must be located in listed species habitat, the Resource Advisor would be consulted to ensure habitat damage and other effects to listed species are minimized and documented. The Resource Advisor should also consider the potential for indirect effects to listed species or their habitat from the siting of camps and staging areas (*e.g.*, if an area is within the water flow pattern, there may be indirect effects to aquatic habitat or species located off-site).
- FS-6** All fire management protocols to protect Federally protected species would be coordinated with local fire suppression agencies that conduct fire suppression on BLM-administered lands to ensure that the agency knows how to minimize impacts to Federally protected species in the area.
- FS-7** The effectiveness of fire suppression activities and Conservation Measures for Federally protected species should be evaluated after a fire, when practical, and the results shared with the USFWS and AGFD. Revise future fire suppression plans and tactical applications as needed and as practical.

1.2 Fuels Treatments, Prescribed Burning and other Fuels Management Actions (FT)

The following Conservation Measures are mandatory when implementing wildland fire use, prescribed fires, and proposed vegetation treatments using mechanical, chemical, and/or biological treatment methods:

- FT-1** Biologists would be involved in the development of prescribed burn plans and vegetation treatment plans to minimize effects to Federally protected species and their habitats within, adjacent to, and downstream from proposed project sites. Biologists would consider the protection of seasonal and spatial needs of Federally protected species (*e.g.*, avoiding or protecting important use areas or structures and maintaining adequate patches of key habitat components) during project planning and implementation.
- FT-2** M.I.S.T. would be followed in all areas with known Federally protected species or habitats.
- FT-3** Pre-project surveys and clearances (biological evaluations/assessments) for Federally protected species would be required for each project site before implementation. All applicable Conservation Measures would be applied to areas with unsurveyed suitable habitat for Federally protected species, until a survey has been conducted by qualified personnel to clear the area for the treatment activity.
- FT-4** Use of motorized vehicles during prescribed burns or other fuels treatment activities in suitable or occupied habitat would be restricted, to the extent feasible, to existing roads, trails, washes, and temporary fuelbreaks or site-access routes. If off-road travel is deemed necessary, any cross-country travel paths would be surveyed prior to use and would be closed and rehabilitated after the prescribed burn or fuels treatment project is completed.

FT-5 As part of the mandatory fire briefing held prior to prescribed burning, all personnel (firefighters and support personnel) would be briefed and educated by Resource Advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel would be informed of the Conservation Measures designed to minimize or eliminate take of the species present.

1.3 Rehabilitation and Restoration (RR)

RR-1 When rehabilitating important areas for Federally listed species that have been damaged by fire or other fuels treatments, the biologist would give careful consideration to minimizing short-term and long-term impacts. Someone who is familiar with fire impacts and the needs of the affected species would contribute to rehabilitation plan development. Appropriate timing of rehabilitation and spatial needs of Federally listed species would be addressed in rehabilitation plans.

RR-2 Seed from regionally native or sterile alien (non-native) species of grasses and herbaceous vegetation would be used in areas where reseeding is necessary following ground disturbance to stabilize soils and prevent erosion by both wind and water.

RR-3 Sediment traps or other erosion control methods would be used to reduce or eliminate influx of ash and sediment into aquatic systems.

RR-4 Use of motorized vehicles during rehabilitation or restoration activities in suitable or occupied habitat would be restricted, to the extent feasible, to existing roads, trails, or washes, and to temporary access roads or fuelbreaks created to enable the fire suppression, prescribed burn, or fuels treatment activities to occur. If off-road travel is deemed necessary, any cross-country travel paths would be surveyed prior to use and would be closed and rehabilitated after rehabilitation or restoration activities are completed.

RR-5 All temporary roads, vehicle tracks, skid trails, and off-road vehicle (ORV) trails resulting from fire suppression and the proposed fire management activities be rehabilitated (water bars, etc.), and be closed or made impassible for future use.

RR-6 Burned area emergency rehabilitation (BAER) activities and long-term restoration activities should be monitored, and the results provided to the USFWS and AGFD. Section 7 consultation for BAER activities would be conducted independently, if necessary.

RR-7 (Recommended) Develop public education plans that discourage or restrict fires and fire-prone recreation uses during high fire-risk periods. Develop brochures, signs, and other interpretive materials to educate recreationists about the ecological role of fires, and the potential dangers of accidental fires.

1.4 Conservation Measures For Fire Management Activities In Riparian and Aquatic Habitats (RA)

The following Conservation Measures be implemented during fire suppression and fuels treatment operations in riparian, wetland, or aquatic habitats, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Fuels treatment activities include prescribed fire and mechanical, chemical, and/or biological vegetation treatments in riparian, wetland, and aquatic habitats. Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations would be documented by the Resource Advisor, and coordinated with the USFWS.

- RA-1** During wildfire suppression, apply M.I.S.T. within riparian areas. Fire suppression actions in riparian areas should be prioritized to minimize damage to stands of native vegetation from wildfire or suppression operations. To the extent possible, retain large, downed woody materials and snags that are not a hazard to firefighters.
- RA-2** Fire suppression and rehabilitation in riparian corridors would be coordinated with the Resource Advisor or qualified biologist approved by BLM.
- RA-3** Site-specific implementation plans that include project areas with Federally protected aquatic or riparian-obligate species would specify fire management objectives and wildland fire suppression guidance, taking into account the special concerns related to these species.
- RA-4** In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical, use wet firebreaks in sandy overflow channels rather than constructing firelines by hand or with heavy equipment.
- RA-5** Construction or development of a crossing for motorized vehicles across a perennial stream would not be permitted, unless an established road already exists or where dry, intermittent sections occur.
- RA-6** Avoid the use of fire retardants or chemical foams in riparian habitats or within 300 feet of aquatic habitats, particularly sites occupied by Federally protected species. Apply operational guidelines as stated in the *Interagency Standards for Fire and Fire Aviation Operations 2003 (or updates)*, "Environmental Guidelines for Delivery of Retardant or Foam Near Waterways".
- RA-7** Priority for placement of fire camps, fire staging areas, and aircraft landing or refueling sites would be outside riparian areas or river/stream corridors.
- RA-8** When using water from sources supporting Federally protected species, care must be taken to ensure adverse impacts to these species are minimized or prevented. Unused water from fire abatement activities would not be dumped in sites occupied by Federally protected aquatic species to avoid introducing non-native species, diseases, or parasites.
- RA-9** If water is drafted from a stock tank or other body of water for fire suppression, it would not be refilled with water from another tank, lakes, or other water sources that may support non-native fishes, bullfrogs, crayfish, or salamanders.

- RA-10** Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems would be required.
- RA-11 (Recommended)** Develop and implement restoration plans for affected riparian or aquatic areas, including long-term monitoring, to document changes in conditions in the riparian zone and watershed that maintain flood regimes and reduce fire susceptibility. Monitor stream water quality and riparian ecosystem health to determine effects of wildfire and fire management activities. Coordinate efforts and results with the USFWS and AGFD.
- RA-12** Fire management treatments within or adjacent to riparian and aquatic habitats be designed to provide long-term benefits to aquatic and riparian resources by reducing threats associated with dewatering and surface disturbance, or by improving the condition of the watershed and enhancing watershed function.
- RA-13** For priority fire/fuels management areas (e.g., WUIs) with Federally protected species or designated critical habitat downstream, BLM biologists and other resource specialists, as appropriate, in coordination with USFWS and AGFD, determine:
- A) The number of acres and the number of projects or phases of projects to occur within one watershed per year.
 - B) An appropriately-sized buffer adjacent to perennial streams in order to minimize soil and ash from entering the stream.
 - C) Where livestock grazing occurs in areas that have been burned, specialists would determine when grazing can be resumed. Such deferments from grazing would only occur when necessary to protect streams from increased ash or sediment flow into streams.¹
- If agreement cannot be reached or treatment would not meet fuel reduction objectives, BLM re-initiate consultation. Our authority to make these types of changes is in the regulations at 43 CFR 4110.3-3(b).

2.0 Species Specific Conservation Measures

In addition to the general Conservation Measures listed in **Sections 1.0 and 2.0**, the following species-specific Conservation Measures would be applied to management actions in special status species habitats to the extent possible, and would be required during fuels and vegetation treatment activities. Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during implementation of management actions would be documented by the BLM or NPS biologist, and coordinated with the USFWS.

2.1 Reptiles

2.1.1 Desert tortoise, Mojave population (FT)

¹"Project" means any surface-disturbing activities proposed that may cause disturbance of desert tortoise habitat and/or death or injury of a desert tortoise, with the exception of grazing by livestock and activities associated with fire suppression.

Management Goals, Objectives, and Actions

1. Continue to actively participate in the recovery of the desert tortoise.
2. Assist in implementation of recovery tasks identified in the Recovery Plan.
3. Continue in further development of a monitoring program and adapting line-distance sampling (or other MOG-approved techniques) to the unique characteristics and needs of the Arizona Strip. The Bureau and NPS would also act through the MOG to assist in seeking funding to implement the monitoring program.
4. Fund, aid, or establish research to determine methods for reducing alien annual grasses in desert tortoise habitat.
5. Fund, aid, or establish research to determine the effects of chemical fire retardants on the desert tortoise and its habitat.
6. Continue to assist adjacent land owners in the development of regional planning efforts to implement the recovery plan. Integrate those plans with the Arizona Strip MP.

Conservation Measures for Desert Tortoise

- DT-1.** Management Guidance for All BLM and NPS-Authorized Actions That Could Result in, Disturbance, Injury, or Death of Desert Tortoise or Modification of Their Habitat.
- DT-1.A.** For each authorized project¹, BLM and NPS would designate a field contact representative (FCR) who would be responsible for overseeing compliance with these conservation measures and for coordination on compliance with the Service. The FCR, qualified biologist(s) approved by the Bureau and NPS, and authorized biologist (see conservation measure DT-1.I) would have the authority and the responsibility to halt all project activities that are in violation of these terms and conditions. These individuals would have a copy of the terms and conditions of this biological opinion while on the work site.
- DT-1.B.** A desert tortoise education program would be presented to all project personnel that may encounter tortoises; such as employees, inspectors, supervisors, contractors, and subcontractors; prior to initiation of activities that may result in disturbance of desert tortoise habitat or death or injury of desert tortoises. The education program would include discussions of the following:
1. legal protection of the desert tortoise and sensitivity of the species to human activities;
 2. a brief discussion of desert tortoise distribution and ecology;
 3. the terms and conditions of applicable biological opinions;
 4. project features designed to reduce adverse effects to desert tortoises and their habitat, and to promote the species' long-term survival;
 5. protocols during encounters with desert tortoises and associated reporting requirements; and
 6. the definition of take and penalties for violations of Federal and State laws.
- DT-1.C.** To the extent possible, project features would be located in previously-disturbed areas or outside of desert tortoise habitat.
- DT-1.D.** Project vehicle use would be limited to designated routes (existing routes prior to designation) to the extent possible.

- DT-1.E.** Areas of new construction or disturbance would be flagged or marked on the ground prior to construction. All construction workers would strictly limit their activities and vehicles to areas that have been marked. Construction personnel would be trained to recognize markers and understand the equipment movement restrictions involved.
- DT-1.F.** Blading of work areas would be minimized to the extent possible. Disturbance to shrubs would be avoided if possible. If shrubs cannot be avoided during equipment operation or vehicle use, wherever possible they would be crushed rather than excavated or bladed.
- DT-1.G.** During the tortoise active season (March 15 through October 15), project features that might trap or entangle desert tortoises such as open trenches, pits, open pipes, etc would be covered or modified to prevent entrapment.
- DT-1.H.** To the extent possible, project activities would be scheduled when tortoises are inactive (October 15 through March 15). The following project activities would only occur from October 15 through March 15: surface disturbance associated with mineral leasing; organized, non-speed vehicular events in DWMAs/ACECs; construction and non-emergency maintenance activities in rights-of-ways in the Beaver Dam and Virgin slopes DWMAs/ACECs; and non-emergency maintenance of existing roads.
- DT-1.I.** If a tortoise or clutch of tortoise eggs is found in a project area, to the extent practicable activities would be modified to avoid injuring or harming it. If activities cannot be modified, the tortoise/clutch would be moved from harm's way by an the authorized biologist the minimum distance possible within appropriate habitat to ensure its safety from death, injury, or collection associated with the project or other activities. The authorized biologist would be allowed some discretion to ensure that survival of each relocated desert tortoise/clutch is likely. Desert tortoises/clutches would not be translocated to lands outside the administration of the Federal government without the written permission of the landowner. Handling procedures for desert tortoises and their eggs would adhere to protocols outlined in Desert Tortoise Council (1994 with 1996 revisions).
- Only biologists authorized by the Service and Arizona Game and Fish Department would handle desert tortoises. If the BLM desires biologists be authorized, the name(s) of the proposed authorized biologist(s) would be submitted to the Service for review and approval at least 15 days prior to the onset of activities that could result in a take. Minimum requirements for authorized biologists include attending the Desert Tortoise Council's training course for handling desert tortoises and/or training by an authorized biologist. The authorized biologist would maintain a record of all desert tortoises encountered during project activities. This information would include for each desert tortoise:
1. The locations and dates of observation
 2. General condition and health, including injuries and state of healing and whether animals voided their bladders
 3. Location moved from and location moved to
 4. Diagnostic markings (i.e. identification numbers of marked lateral scutes)
- Desert tortoises that are handled would be marked for future identification. An identification number (using the acrylic paint/epoxy technique) would be placed on the 4th costal scute (Fish and Wildlife Service 1992). No notching of scutes or replacement of fluids with a syringe is authorized.

DT-1.J. At no time would vehicle or equipment fluids be dumped on public lands. All accidental spills must be reported to BLM and NPS and cleaned up immediately, using the best available practices according to the requirements of the law. All spills of federally or State-listed hazardous materials that exceed reportable quantities would be promptly reported to the appropriate State agency and the BLM and NPS.

DT-1.K. For surface-disturbing activities conducted from March 15 to October 15 in desert tortoise habitat, construction and operation activities would be monitored by a qualified desert tortoise biologist approved by the Bureau and NPS. The biologist would be present during all activities in which encounters with tortoises may occur. The biologist would watch for tortoises wandering into construction areas, check under vehicles, check at least three times per day any excavations that might trap tortoises, and conduct other activities necessary to ensure that death or injury of tortoises is minimized.

DT-1.L. Unleashed dogs would be prohibited in project areas.

DT-1.M. In DWMAs/ACECs, vehicles associated with Bureau-authorized projects traveling on unpaved roads in desert tortoise habitat would not exceed speed limits established by the Bureau as necessary to protect desert tortoises. These speed limits would generally not exceed 40 mph even on the best unpaved roads but may be much less than this on some roads.

DT-1.N. Temporary fencing, such as snow fencing, chain link, and other suitable materials would be used in designated areas as determined by the Bureau to reduce encounters with tortoises from March 15 to October 15 on short-term projects, such as construction of power lines, burial of fiber optic cables, etc, where encounters with tortoises are likely.

DT-1.O. Long-term or permanent project sites in which continued encounters with desert tortoises are expected, such as construction of schools under an R&PP lease, roads, power plants, office buildings, and other permanent or long-term projects would be enclosed with desert tortoise barrier fencing to prevent tortoises from wandering onto the project site where they may be subject to collection, death, or injury. Barrier fencing should consist of wire mesh with a maximum mesh size of 1-inch (horizontal) by 2-inch (vertical) fastened securely to posts. The wire mesh would extend at least 18 inches above the ground and preferably 12 inches below the surface of the ground. Where burial is not possible, the lower 12 inches would be folded outward, away from the enclosed site, and fastened to the ground so as to prevent tortoise entry. Any gates or gaps in the fence would be constructed and operated to prevent desert tortoise entry (such as installing "tortoise guards" similar to cattle guards, and/or keeping gates closed). Specific measures for tortoise-proofing gates and gaps would be addressed project by project. Construction of the barrier fence should be in compliance with conservation measure DT-4. Once fence construction is complete, all tortoises within the fence would be relocated outside the fence in accordance with conservation measure 1.I. If more than 20 tortoises be relocated from any one area enclosed by a fence, the Bureau or NPS would contact the Service in regard to disposition of the animals. After the area within the fence has been cleared of tortoises, construction and operation activities may occur within the fence without the presence and monitoring of a biologist (see conservation measure DT-1.K.).

DT-1.P. New paved roads and highways in desert tortoise habitat (only authorized on BLM lands outside of DWMAs/ACECs) or major reconstruction or modifications

of existing paved roads through desert tortoise habitat would be fenced with desert tortoise barrier fencing (see DT-1.O.). Culverts, to allow safe passage of tortoises, would be constructed approximately every mile of new or reconstructed paved road (culverts can also serve the more typical purpose of conducting water under roads). The culvert diameter needed to encourage tortoise use is correlated with culvert length, but generally short culverts of large diameter are most likely to be used. The floor of the culvert would be covered with dirt and maintenance should be performed as necessary to maintain an open corridor for tortoise movement. Culvert design would be coordinated with and approved by the Service.

- DT-1.Q.** Use of new roads constructed for specific non-public purposes, such as access routes to microwave towers, would be limited to administrative use only.
- DT-1.R.** Temporary access routes created during project construction would be modified as necessary to prevent further use. Closure of access routes could be achieved by ripping, barricading, posting the route as closed, and/or seeding and planting with native plants.
- DT-1.S.** In regard to locatable minerals in DWMA/ACECs, the Bureau would require plans of operations and bonding for any activity above the level of casual use, pursuant to the surface management regulations (43 CFR 3809). The Bureau would approve plans of operation that reduce the chance of take occurring in accordance with these terms and conditions.
- DT-1.T.** In regard to new rights-of-ways in the Beaver Dam and Virgin slopes DWMA/ACECs, such rights-of-ways would be routed away from high-density tortoise populations, and along the edges of DWMA/ACECs. Linear right-of-ways would be placed adjacent or parallel to existing rights-of-ways and share vehicular access. Utilities would be co-located with other utility projects whenever feasible.
- DT-1.U.** To reduce attraction of potential desert tortoise predators, project sites in desert tortoise habitat would be maintained in a sanitary condition at all times; waste materials at those sites would be placed in covered receptacles and disposed of promptly at an appropriate waste disposal site. "Waste" refers to all discarded matter, including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. All reasonable effort would also be taken to reduce or eliminate water sources associated with project activities that might attract ravens and other predators.
- DT-1.V.** After completion of the project, trenches, pits, and other features in which tortoises could be entrapped or entangled, would be filled in, covered, or otherwise modified so they are no longer a hazard to desert tortoises.
- DT-1.W.** After project completion, measures would be taken to facilitate restoration. Restoration techniques would be tailored to the characteristics of the site and the nature of project impacts. Techniques may include removal of equipment and debris, recontouring; and seeding, planting, transplanting of cacti and yuccas, etc. Only native plant species, preferably from a source on or near the project area, would be used in restoration.
- DT-1.X.** Retain in federal ownership all areas administratively designated for protection of special status species (e.g. Areas of Critical Environmental Concern (ACECs) and Desert Wildlife Management Areas (DWMA), designated or proposed critical habitat, and lands supporting listed or proposed species. Specific parcels of category 3 desert tortoise habitat outside of DWMA/ACECs that do not possess the primary constituent elements required for survival and recovery of the

species may be made available for disposal. Parcels where future development would likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange. Although individual actions may have adverse effects, the net effects of land disposals/exchanges in these areas would be beneficial to federally listed or proposed species.

DT-2. Measures would be taken to limit the extent of projects authorized in DWMA/ACECs.

DT-2.A. BLM would only authorize mineral leasing in the DWMA/ACECs with the stipulation of waivable no surface occupancy or no surface occupancy. All activities associated with surface occupancy for mineral leasing within DWMA/ACECs would be limited to the period October 15 to March 15 and subject to all other conservation measures.

DT-2.B. DWMA/ACECs would be closed to mineral sales.

DT-2.C. The Bureau/NPS would prohibit live vegetation harvest in DWMA/ACECs, except salvage in areas where surface disturbance has been authorized.

DT-2.D. Mechanical treatment or vegetation conversion within DWMA/ACECs would not be authorized unless such treatments benefit or improve desert tortoise management. A mitigation plan for each treatment or conversion would be developed and approved by the Service. A determination that such treatment or conversion benefits or improves desert tortoise management would require concurrence by the Service.

DT-2.E. Within DWMA/ACECs, the Bureau/NPS would limit public collection of dead and down wood to personal camp use only.

DT-2.F. The Bureau would authorize no R&PP land leases, airport leases, or military maneuvers; and no entries under the Desert Land Entry Act, Carey Act, and Indian Allotments Act in the DWMA/ACECs.

DT-2.G. All Bureau and NPS lands within DWMA/ACECs would be retained in public ownership.

DT-2.H. The Bureau would seek to acquire non-Federal lands in the DWMA/ACECs from willing sellers through sale exchange.

DT-2.I. No new landfills or sewage treatment ponds would be authorized in DWMA/ACECs.

DT-2.J. No new rights-of-ways would be authorized in the Pakoon DWMA/ACEC. The Bureau would strongly discourage new rights-of-ways and temporary use permits within the Beaver Dam Slope and Virgin Slopes DWMA/ACECs; such rights-of-ways and temporary use permits within DWMA/ACECs would only be authorized if no reasonable alternative exists and impacts to tortoises and their habitat can be mitigated. Surface disturbance (before restoration) resulting from all new rights-of-ways and temporary use permits in the DWMA/ACECs would not exceed 40 acres through the life of the project.

DT-2.K. The Bureau would close DWMA/ACECs to authorization or renewal of material site rights-of-ways.

DT-2.L. The Bureau/NPS would complete a proposal to close roads and designate routes in the DWMA/ACECs. Roads targeted for closure would include those that 1) have no purpose, 2) are duplicative or redundant, or 3) are causing high levels of mortality of tortoises. Vehicles would be restricted to existing roads and trails prior to route designation. After designation, vehicles would be restricted to designated routes only. Implementation of the closure/designation plan would include the following actions 1) sign entry portals/major intersections with signs that read "Limited to Designated Roads and Trails", 2) sign all designated routes

as open, 3) and sign along designated routes indicating that driving off of designated routes is not permitted.

- DT-2.M.** No new paved roads would be authorized in DWMAs/ACECs. Temporary upgrading of existing roads, and construction of new unpaved roads in DWMAs/ACECs could be authorized only if positive benefits to tortoise management occur.
- DT-2.N.** The Bureau would seek funding and cooperate with Mojave County, Arizona Department of Transportation, Federal Highway Administration, and others on opportunities to erect tortoise barrier fencing along Highway 91 on the Beaver Dam Slope and along other routes where desert tortoise mortality is or becomes significant.
- DT-2.O.** The Bureau/NPS would maintain or authorize maintenance of existing roads in desert tortoise habitat in accordance with the schedules and specifications provided in this MP and in the District Road Maintenance Plan. Non-emergency maintenance activities would be conducted from October 15 to March 15. Operators of road graders and other maintenance equipment would attend the education program described in conservation measure DT-1.B. Maintenance activities would be limited to previously disturbed areas, unless cleared by a qualified biologist.
- DT-2.P.** The Bureau would restrict vehicle-based camping in DWMAs/ACECs to within 50 ft of designated routes. Before route designation, vehicle-based camping would be limited to within 50 ft of existing routes. No camping would be authorized for longer than 14 consecutive days in any one area within DWMAs/ACECs.
- DT-2.Q.** No competitive speed vehicle events would be authorized in DWMAs/ACECs.
- DT-2.R.** Within desert tortoise DWMAs/ACECs, the Bureau/NPS would apply the following stipulations to any non-speed motor vehicular events (or non-speed portions of speed events) requiring permitting by the Bureau:
1. No organized non-speed events would occur from March 15 through October 15.
 2. Permits would be required for events with 50 or more participants.
 3. Vehicle travel would be limited to designated routes, or before route designation, to existing routes.
 4. Vehicles would not exceed the legal speed limit (posted or unposted) of the road in which they are on during the event.
 5. No more than 400 motorcycles or all terrain vehicles, or 300 four-wheeled vehicles would be allowed in any one event.
 6. Events would have enough monitors to ensure compliance with regulations.
- DT-2.S.** The Bureau/NPS would ensure that wildlife management activities do not contribute to the proliferation of predators within desert tortoise habitat.
- DT-2.T.** New wildlife guzzlers would be permitted on BLM lands in desert tortoise habitat only if they are designed so as to exclude desert tortoises.
- DT-2.U.** The Bureau would authorize no translocations of desert tortoises from private to public lands unless 1) prior authorization from the Service and Arizona Game and Fish Department is obtained, 2) the desert tortoise population in the area to which a tortoise(s) be moved is depressed, 3) testing of animals to be translocated is conducted to ensure that spread of URTD or other diseases is not facilitated as a result of translocations, 4) handling of desert tortoises is in compliance with conservation measure DT-1.I., and 5) protocols are followed to ensure that translocated animals have the greatest chance for survival and do not disrupt the behavior of resident animals.

- DT-2.V.** The Bureau/NPS would continue to monitor and patrol the DWMA/ACECs and desert tortoise habitat, and to investigate illegal activities on public lands in the area. The Bureau would provide law enforcement presence in the DWMA/ACECs at a level adequate to promote public compliance with use regulations.
- DT-2.W.** If law enforcement, signing, and public education fail to control illegal public use and violations of DWMA/ACEC regulations, the Bureau/NPS would develop other options, including fencing areas as needed to enhance compliance with regulations.
- DT-2.X.** The Bureau would cooperate with other agencies and groups to identify areas where uncontrolled dogs are causing desert tortoise mortality. If predation of tortoises by dogs is discovered, the Bureau would encourage Mohave County to enforce ordinances prohibiting uncontrolled dogs in those areas. Dogs are required to be on leash on NPS lands.
- DT-2.Y.** The Bureau/NPS would authorize no discharge of firearms in the DWMA/ACECs, except for hunting of big game or upland game birds from September through February, and in association with official Bureau/NPS duties, such as law enforcement or euthanasia of sick or injured burros or cows.
- DT-2.Z.** The Bureau would assess compensation at the category 1 rate for any proposed projects in the Beaver Dam, Virgin slope, and Pakoon DWMA/ACECs.
- DT-3** Measures would be taken to eliminate or minimize take of desert tortoises resulting from grazing by livestock and burros.
- DT-3.A.** No livestock grazing would be authorized in the Pakoon DWMA/ACEC. No livestock grazing would be authorized in the Beaver Dam and Virgin slope DWMA/ACECs from March 15 to October 15.
- DT-3.B.** Livestock grazing in the Beaver Dam and Virgin slope DWMA/ACECs between October 15 and March 15, and outside of the DWMA/ACECs in desert tortoise habitat, would be in compliance with reasonable and prudent measures and terms and conditions of applicable biological opinions (e.g. 2-21-91-F-337).
- DT-3.C.** The Bureau would set the herd management level to zero in that portion of the Tassi-Gold Butte Herd Management Area (HMA) on Bureau-administered lands in Arizona. Burros would be promptly removed from the HMA in Arizona. The Bureau would cooperate with Lake Mead National Recreation Area and Bureau offices in Nevada to keep the burro population in the HMA at approximately 10 animals or less at any one time. Any burros in the DWMA/ACECs would be promptly removed.
- DT-3.D.** No new fences or waters for burro management would be authorized by the Bureau on public lands in desert tortoise habitat.
- DT-3.E.** Habitat restoration in accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines would not include planting or seeding of nonnative plants.
- DT-4** Preconstruction surveys would be conducted to locate desert tortoises that may be injured or killed as a result of proposed activities. Projects would be altered or tortoises in harm's way would be relocated to avoid lethal take of tortoises in project areas.
- DT-4.A.** Prior to any surface-disturbing activities associated with "projects", as defined in the footnote on page 79, work sites would be surveyed for desert tortoises by a qualified biologist approved by the Bureau/NPS. Areas of new disturbance would

be surveyed with 100-percent coverage. For project activities occurring during the desert tortoise active season (March 15 through October 15), surveys would be conducted within 24 hours of initiation of surface-disturbing activities. Between October 15 and March 15 any new disturbance would be preceded by 100-percent surveys conducted within one week of the proposed activities. During surveys, occupied desert tortoise burrows in or within 40 feet of areas to be disturbed would be excavated using hand tools under the supervision of an authorized biologist. Burrows discovered in areas to be disturbed by project activities would be collapsed or blocked to prevent entry by tortoises (any tortoises in those burrows would be relocated first). Desert tortoises and any desert tortoise eggs found in areas to be disturbed would be relocated in accordance with conservation measure DT-1.I. All handling of desert tortoises and their eggs would be in accordance with conservation measure DT-1.I.

- DT-5** Programs to inform and educate the public about the DWMA/ACECs would be implemented to facilitate compliance with DWMA/ACEC regulations that protect the tortoise, and to build support for desert tortoise recovery efforts.
- DT-5.A.** The Bureau/NPS would, upon implementation of the route designation/closure plan (conservation measure DT-2.L.), make available to the public a route designation map that displays all open routes, and explains vehicle, camping, recreational, and other public use regulations and opportunities in the DWMA/ACECs, and explains the purpose of the DWMA/ACECs.
- DT-5.B.** The Bureau/NPS would use various mechanisms of public outreach to inform the public about the DWMA/ACECs and recovery of the desert tortoise. These mechanisms may include interpretive displays at the Interagency Information Center in St. George, interpretive kiosks at entry points to the DWMA/ACECs, news releases, open houses to answer questions about DWMA/ACEC designation and management, and/or other actions.
- DT-6** Include tortoise habitat in the Beaver Dam Mountains, Paiute, and Grand Wash Cliff wilderness areas into the DWMA/ACECs, or develop wilderness management plans for these areas that address recovery needs of the desert tortoise.
- DT-7** Take appropriate action to suppress all wildfires in desert tortoise habitat.
- DT-7.A.** Take appropriate action to suppress all wildfires in desert tortoise habitat, based on preplanned analysis and consistent with land management objectives, including threats to life and property. Full suppression activities would be initiated within key desert tortoise habitat areas identified in site-specific Fire Management Plans.
- DT-7.B.** Suppress all wildfires in desert tortoise habitat with minimum surface disturbance, in accordance with the guidelines in Duck et al. (1995) and the 1995 programmatic biological opinion on fire suppression on the Arizona Strip (2-21-95-F-379).
- DT-7.C.** Pre-position suppression forces in critical areas during periods of high fire dangers.
- DT-7.D.** As soon as practical, all personnel involved in wildfire suppression (firefighters and support personnel) would be briefed and educated about desert tortoises and the importance of protecting habitat and minimizing take, particularly due to vehicle use. Fire crews would be briefed on the desert tortoise in accordance with Appendix II of Duck et al. (1995).

- DT-7.E.** If wildfire or suppression activities cannot avoid disturbing a tortoise, the Resource Advisor or monitor would relocate the tortoise, if safety permits. The tortoise would be moved into the closest suitable habitat within two miles of the collection site that would ensure the animal is reasonably safe from death, injury, or collection associated with the wildfire or suppression activities. The qualified biologist would be allowed some discretion to ensure that survival of each relocated tortoise is likely. If the extent or direction of movement of a fire makes sites within two miles of the collection site unsuitable or hazardous to the tortoise or biologists attempting to access the area, the tortoise may be held until a suitable site can be found or habitat is safe to access and not in immediate danger of burning. The Resource Advisor would contact the USFWS Arizona Ecological Services Field Office (AESFO) as soon as possible concerning disposition of any animals held for future release. Desert tortoises would not be placed on lands outside the administration of the Federal government without the written permission of the landowner. Handling procedures for tortoises, including temporary holding facilities and procedures, would adhere to protocols outlined in Desert Tortoise Council (1994).
- DT-7.F.** Upon locating a dead, injured, or sick desert tortoise, initial notification must be made to the appropriate USFWS Law Enforcement Office within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph, and any other pertinent information. The notification would be sent to the Law Enforcement Office with a copy to the AESFO.
- DT-7.G.** Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. If possible, the remains of intact desert tortoises would be placed with educational or research institutions holding appropriate State and Federal permits. If such institutions are not available, the information noted above would be obtained and the carcass left in place. Arrangements regarding proper disposition of potential museum specimens would be made with the institution prior to implementing the action. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should any treated desert tortoise survive, the USFWS should be contacted regarding final disposition of the animal.
- DT-7.H.** The Resource Advisor or monitor(s) would maintain a record of all desert tortoises encountered during fire suppression activities. This information would include for each desert tortoise: 1) locations and dates of observation; 2) general condition and health, including injuries and state of healing, and whether animals voided their bladders; 3) location moved from and to; and 4) diagnostic markings (i.e., identification numbers of marked lateral scutes). No notching of scutes or replacement of fluids with a syringe is authorized.
- DT-7.I** Prior to moving a vehicle, personnel would inspect under the vehicle for tortoises. If a tortoise is found under the vehicle, the tortoise would be allowed to move away from the vehicle on its own accord, if possible. Otherwise an individual would move the tortoise to a safe locality in accordance with FS-2 and DT-7.E.
- DT-7.J.** Off-road vehicle activity would be restricted to the minimum necessary to suppress wildfires. Off-road vehicle activity would not be permitted on NPS lands. Vehicles would be parked as close to roads as possible, and vehicles would use wide spots in roads or disturbed areas to turn around. Whenever possible, a biologist or crewperson trained to recognize tortoises and their shelter sites would

precede any vehicle traveling off-road to direct the driver around tortoises and tortoise burrows. Whenever possible, local fire-fighting units should provide direction and leadership during off-road travel because of their expertise and knowledge of area sensitivities.

- DT-7.K.** Fire-related vehicles would drive slow enough to ensure that tortoises on roads can be identified and avoided.
- DT-7.L.** Fire crews or rehabilitation crews would, to the extent possible, obliterate off-road vehicle tracks made during fire suppression in tortoise habitat, especially those of tracked vehicles, to reduce future use.
- DT-7.M.** To the maximum extent practical, campsites, aircraft landing/fueling sites, and equipment staging areas would be located outside of desert tortoise habitat or in previously disturbed areas. If such facilities are located in desert tortoise habitat, 100 percent of the site would be surveyed for desert tortoises by a qualified biologist approved by BLM or NPS, whenever feasible. Any tortoises found would be moved to a safe location in accordance with FS-2 and DT-7.E. All personnel located at these facilities would avoid disturbing active tortoise shelter sites.
- DT-7.N.** Elevated predation by common ravens or other predators attributable to fire suppression activities would be reduced to the maximum extent possible. Work areas, including campsites, landing/fueling sites, staging areas, etc. would be maintained in a sanitary condition at all times. Waste materials at those sites would be contained in a manner that would avoid attracting predators of desert tortoises. Waste materials would be disposed of at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
- DT-7.O.** Backfiring operations are permitted where necessary in desert tortoise habitat. Burning out patches of identified habitat within or adjacent to burned areas is not permitted as a standard fire suppression measure unless necessary for firefighter or public safety or to protect property, improvements, or natural resources.
- DT-7.P.** Use of foam or retardant is authorized within desert tortoise habitat.
- DT-7.Q.** Rehabilitation of vegetation in tortoise habitat would be considered, including seeding, planting of perennial species, etc.
- DT-7.R.** Recovery of vegetation would be monitored, including establishing and monitoring paired plots, inside and outside burned areas in tortoise habitat. Recovery plans would be coordinated with the USFWS and AGFD.
- DT-7.S.** The effectiveness of wildfire suppression activities and desert tortoise Conservation Measures would be evaluated after a wildfire. Procedures would be revised as needed.

2.2 Amphibians (AM) (Includes Relict leopard frog (FC))

- AM-1** Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.
- AM-2** All personnel performing fire management activities at any creek crossing would be informed of the potential presence of aquatic amphibians and the need to perform their duties to avoid impacts to the habitat.

2.3 Birds

2.3.1 California Condor (FE and 10J)

Management Goals, Objectives, and Actions

1. Continue to actively participate in the recovery of the California condor.
2. Assist in implementation of recovery tasks identified in the Recovery Plan.
3. Implement the protective measures for California condors that are contained in the July 2004 "Recommended Protection Measures for Pesticide Applications in The Southwest Region of the U.S. Fish and Wildlife Service" when conducting chemical treatments.
4. Educate employees and your public users about this species.

Conservation Measures for California Condor

CC-1. Management Guidance for Projects Constructed or Implemented by Authorized or Permitted Members of the Public Within the 10(j) Area

CC-1.A. Immediately prior to the start of an authorized or permitted project, BLM/NPS would contact personnel monitoring California condor locations and movements on the Arizona Strip to determine the locations and status of condors in or near the project area.

CC-1.B. BLM/NPS would request that permit holders notify the BLM/NPS wildlife team lead or condor biologist if California condors visit the worksite while permitted activities are underway. BLM/NPS may encourage permit holders to modify, relocate, or delay project activities where adverse affects to condors may result.

CC-1.C. Where condor nesting activity is known within 0.5 miles of permitted or authorized activities that include operation of heavy machinery, BLM/NPS may encourage the operator to avoid use of the equipment during the active nesting season (February 1- November 30), or as long as the nest is viable.

CC-1.D. Where condors occur within 1.0 mile of permitted or authorized activities that include blasting, BLM/NPS encourage that blasting be postponed until the condors leave the area or are hazed away by personnel permitted to haze condors. Where condor nesting activity is known within 1.0 mile of the project area, BLM/NPS encourage that blasting activity be delayed until after the active nesting season (February 1- November 30), or as long as the nest is viable. These dates may be modified based on the most current information regarding condor nesting.

CC-2. Management Guidance for Projects Constructed or Implemented by BLM/NPS Employees or Contractors Within the 10(j) Area AND For All BLM/NPS-Authorized Actions, Regardless of Proponent, Outside the 10(j) Area on the Arizona Strip.

- CC-2.A.** Immediately prior to the start of a permitted project, BLM/NPS would contact personnel monitoring California condor locations and movement on the Arizona Strip to determine the locations and status of condors in or near the project area.
- CC-2.B.** Where California condors visit a worksite while activities are underway, the on-site supervisor would notify the BLM/NPS wildlife team lead or condor biologist. Project workers and supervisors would be instructed to avoid interaction with condors. Project activities would be modified, relocated, or delayed if those activities could have adverse effects on condors. Operations would cease until the bird leaves on its own or until techniques are employed by permitted personnel which results in the individual condor leaving the area.
- CC-2.C.** Where condor nesting activity is known within 0.5 miles of activities that include operation of heavy machinery, BLM/NPS would direct the operator to cease equipment use during the active nesting season (February 1- November 30), or as long as the nest is viable. Where feasible and consistent with NEPA, BLM/NPS may relocate operations to a site greater than 0.5 miles from the condor nest site.
- CC-2.D.** Where condors occur within 1.0 miles of activities that include blasting, BLM/NPS would require that blasting be postponed until the condors leave the area or are hazed away by personnel permitted to haze condors. Where condor nesting activity is known within 1.0 miles of the project area, BLM/NPS cease blasting during the active nesting season (February 1- November 30), or as long as the nest is viable. These dates may be modified based on the most current information regarding condor nesting.
- CC-3.** Management Guidance for All BLM/NPS-Authorized Actions, Regardless of Proponent or location Within the Planning Area.
- CC-3.A.** The project site would be cleaned up at the end of each day the work is being conducted (e.g., trash removed, scrap materials picked up) to minimize the likelihood of condors visiting the site. BLM/NPS staff may conduct site visits to the area to ensure adequate clean-up measures are taken.
- CC-3.B.** For projects where potential exists for leakage or spill of hazardous materials, a spill plan would be developed and implemented to prevent water contamination and potential poisoning of condors. The plan would include provisions for immediate clean-up of any hazardous substance, and would define how each hazardous substance would be treated in case of leakage or spill. The plan would be reviewed by the BLM condor lead biologist to ensure condors are adequately addressed.
- CC-3.C** BLM/NPS would implement the protective measures for California condors that are contained in the March 2004 "Recommended Protection Measures for Pesticide Applications in The Southwest Region of the U.S. Fish and Wildlife Service."
- CC-3.D.** Use of non-lead ammunition is strongly encouraged for activities involving the discharge of firearms.

- CC-4. Management Guidance for All Actions Involving Use of Aircraft, Regardless of Proponent or location Within the Planning Area.**
- CC-4.A.** Aircraft use along the Vermilion Cliffs, Paria Plateau, or any sites where condors are actively breeding or roosting would be minimized to the extent possible. Known active nest sites would be avoided.
 - CC-4.B.** The BLM condor biologist or Wildlife Program Lead would contact the Peregrine Fund, as appropriate, immediately before operations involving aviation begin to check on possible locations of condors in the subject area.
 - CC-4.C.** All BLM/NPS-authorized aviation personnel would be provided literature and/or instructed regarding condor concerns prior to conducting aerial operations.
 - CC-4.D.** Aircraft would maintain and maximize safe flying separation distances from condors in the air or on the ground unless safety concerns override this restriction. If airborne condors approach aircraft, aircraft would give up airspace to the extent possible, as long as this action does not jeopardize safety. Aircraft would keep a minimum of 0.25 miles away from condors located on the ground.
- CC-5. Management Guidance for Fire Suppression, Fire Use, Prescribed Fire, and Related Actions Within the Planning Area.**
- CC-5.A.** The Resource Advisor would contact the Peregrine Fund daily (at 520-606-5155 or 520-380-4667) to check on locations of condors during fire suppression or fuels treatment activities involving aviation. This information would be communicated to the Incident Commander and aviation personnel.
 - CC-5.B.** Any presence of condors in the general area of an active fire would be reported immediately to the Resource Advisor, who would in turn advise the BLM condor biologist, as appropriate. The BLM condor biologist or the AZ Strip F.O wildlife team lead would be the primary contacts with the U.S. Fish and Wildlife Service and the Peregrine Fund when such contacts are needed regarding condor concerns.
 - CC-5.C.** Fire dispatch would immediately notify the Peregrine Fund at either (208) 362-3811 or (928) 355-2270 whenever a fire or other event on the Paria Plateau is reported which may conceivably threaten the condor holding pens and facilities atop the Vermilion Cliffs.
 - CC-5.D.** If condors arrive at any area of human activity associated with fire suppression or fuels treatment projects (wildland fire use, prescribed fire, vegetation treatments), the birds would be avoided. The assigned Resource Advisor or a qualified wildlife biologist approved by BLM would be notified, and only permitted personnel would haze the birds from the area.
 - CC-5.E.** All District BLM/NPS fire personnel, including helicopter pilots, would be provided literature or instructed regarding condor concerns. Normally this would be done by the BLM condor biologist when the fire crews first come on and are trained on various subjects, including desert tortoise concerns. If additional pilots come on during the summer, fire dispatch would notify the BLM condor biologist (435 688-3224) so that they can also be briefed.

- CC-5.F.** All helicopter dip tanks containing water would be covered when not in use or personnel would be stationed nearby until a cover is in place.
- CC-5.G.** If any fire retardant chemicals must be used in areas where condors are in the vicinity, the application area would be surveyed and any contaminated carcasses would be removed as soon as practical to prevent them from becoming condor food sources.
- CC-5.H.** Smoke from prescribed fire projects would be prevented from negatively affecting condor holding pens and breeding, nesting, and chick rearing sites. A proposed prescribed fire would not be initiated, or an existing fire use event would be modified or terminated, in order to prevent or stop significant amounts of smoke, or smoke that would remain in place for an extended period of time, or chronic smoke events, from occurring in area(s) where condors are held or attempting to breed, nest, or rear chicks.
- CC-5.I.** BLM would adhere to the air quality standards set by the Arizona Department of Environmental Quality.
- CC-5.J.** All camp areas would be kept free from trash.

2.3.2 Southwestern willow flycatcher (FE)

Management Goals and Objectives

1. Continue to actively participate in the recovery of the southwestern willow flycatcher. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Provide protection from threats and create/secure sufficient habitat to assure maintenance of these populations and/or habitats over time.
3. Increase and improve occupied, suitable, and potential breeding habitat.
4. Continue supporting and participating in southwestern willow flycatcher survey and monitoring efforts on lands in the Planning Area.
5. Work towards restoring native riparian vegetation in sites that have the potential to support future breeding habitat for this species.
6. Continue to support applications for instream flow rights with the Arizona Department of Water Resources in rivers supporting willow flycatcher habitat.
7. Retain riparian area river channels, floodplains, and terraces in federal ownership. Carefully examine all exchanges that could affect water flows (either groundwater or surface water) to ensure that development on those lands not affect riparian habitats.
8. Implement the protective measures for southwestern willow flycatchers that are contained in the July 2004 "Recommended Protection Measures for Pesticide Applications in The Southwest Region of the U.S. Fish and Wildlife Service" when conducting chemical treatments.
9. Continue to conduct southwestern willow flycatcher surveys in suitable habitat.
10. Continue to monitor habitat conditions in suitable and potential southwestern willow flycatcher habitat in order to be able to determine how best to manage these riparian areas to protect this and other riparian dependent species.
11. Educate employees and public users about southwestern willow flycatchers.

Conservation Measures for Southwestern Willow Flycatcher**WF-1. Management Guidance for Achieving Habitat Objectives**

WF-1.A. Maintain a policy of “no net loss” of riparian habitat.

WF-1.B. Protect occupied willow flycatcher habitats as a first priority.

WF-1.C. Maintain and increase riparian habitats suitable for southwestern willow flycatcher nesting. Suitable structural characteristics may be achieved through restoring, maintaining, enhancing, and creating habitat. Suitable flycatcher habitat should be managed so that its suitable characteristics are not eliminated or degraded. Manage for large, contiguous blocks of habitat rather than for small fragmented areas. Enhance connectivity to currently isolated suitable sites. Encourage the use of buffer zones between riparian habitats and adjacent upland areas. Promote establishment of areas of slow/back waters.

WF-1.D. Manage potential habitat to achieve structural and vegetation characteristics necessary to support increasing numbers of breeding southwestern willow flycatcher pairs within 5-20 years. Potential flycatcher habitat should be managed to allow natural regeneration (through natural processes) into suitable habitat as rapidly as possible.

WF-1.E. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

WF-1.F. Restore, protect, and expand riparian migration and stopover habitats in the Planning Area.

WF-1.G. Continue to identify and map suitable and potential habitat areas for southwestern willow flycatchers.

WF-1.H. Close and rehabilitate roads and trails used by off-highway vehicles within riparian areas, or areas with the potential to support riparian vegetation.

WF-2. Management Guidance for Water Management

WF-2.A. Manage water diversions and groundwater withdrawals to maintain streamside vegetation.

WF-2.B. Where possible and practicable, reduce or eliminate physical stresses, such as high salinity or reduced stream flows that favor exotic plants. Do not authorize actions that not allow for natural stream flow regimes including periodic flood events.

WF-2.C. Net effects of land disposals/exchanges in the Virgin River corridor would be beneficial to the southwestern willow flycatcher. All land exchanges or disposals should benefit aquatic and riparian resources by reducing threats to those habitats associated with dewatering and surface disturbance.

WF-2.D. Lands to be acquired would have development potential similar to the disposed lands and would be located in similar proximity to the Virgin River or significant tributaries.

WF-2.E. All acquired lands would not have ground or surface water used or reserved for use by non-Federal interests after it is acquired by the government. All existing

such uses must be terminated upon acquisition and all rights transferred to the Federal government.

WF-2.F. Parcels where future development likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange.

WF-3. Management Guidance for Control of Invasive Exotic Species

WF-3.A. Determine the use vs. availability of invasive exotic species, such as tamarisk, by southwestern willow flycatcher at occupied nesting sites.

WF-3.B. Retain native riparian vegetation in floodplains or channels.

WF-3.C. At native dominated sites, retain tamarisk in occupied flycatcher habitat and, where appropriate, in suitable but unoccupied habitat, unless there is a trend for steady increase of tamarisk.

WF-3.D. In suitable and potential habitats where exotic species are to be removed through chemical or mechanical means, use a temporally staged approach to clear areas so some mature habitat remains throughout the restoration period for potential use by flycatchers.

WF-4. Management Guidance for Minimizing Human Disturbance

WF-4.A. Reduce or eliminate impacts to southwestern willow flycatchers and/or their habitat from recreational activities. Recreation that degrades riparian habitat would be prohibited in riparian areas on Bureau land along the Virgin River. Restrictions could include:

1. Reducing or eliminating recreational fires.
2. Confining camping areas.
3. Locate recreational activity areas away from suitable or potential southwestern willow flycatcher habitat.
4. Minimize trash, debris, and other attractants to scavengers, predators, and brown-headed cowbirds.
5. Provide on-site monitors where recreation conflicts exist.

WF-5. Management Guidance for Grazing Management

WF-5.A. Minimize or eliminate disturbance, injury, mortality, or other forms of take of southwestern willow flycatchers resulting from grazing by livestock.

WF-5.B. Exclude livestock grazing year-round from occupied southwestern willow flycatcher nesting habitat. Unsurveyed suitable habitat should be considered occupied. If livestock are excluded using fencing, fencing should be inspected and maintained annually.

WF-5.C. Exclude livestock grazing from unoccupied suitable southwestern willow flycatcher nesting habitat during the growing season (bud-break to leaf drop). This includes portions of the following allotments: Littlefield Community, Lambing, Kanab Creek, and Wildband.

- WF-5.D.** In potential habitat, determine if livestock grazing is a major stressor or is otherwise preventing development of the habitat into suitable flycatcher habitat. Where this is the case, exclude livestock grazing from potential southwestern willow flycatcher nesting habitat during the growing season (bud-break to leaf drop).
- WF-5.E.** Investigate grazing systems, strategies, and intensities for riparian recovery and maintenance.
- WF-5.F.** Investigate direct effects of livestock grazing on southwestern willow flycatchers and their habitat.
- WF-6.** Management Guidance for Brown-headed Cowbird Parasitism and Predation
 - WF-6.A.** Increase the amount and quality of riparian habitat to increase habitat patch sizes and local flycatcher population sizes thereby minimizing levels and impacts of cowbird parasitism.
 - WF-6.B.** Collect baseline data on cowbird parasitism.
 - WF-6.C.** Develop and implement cowbird management programs where parasitism rates are greater than 20%. Evaluate effectiveness of cowbird trapping at present locations by monitoring nests for parasitism and reproductive success.
 - WF-6.D.** Reconsider assessment of habitat quality or other threats if cowbird control measures do not increase number of breeding flycatchers.
 - WF-6.E.** Reduce direct impacts that topple or otherwise destroy nests.
- WF-7.** Management Guidance for Pesticide Issues
 - WF-7.A.** Determine impact of pesticide use on willow flycatcher reproduction adjacent to riparian areas.
 - WF-7.B.** Limit or eliminate use of harmful pesticides adjacent to riparian areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad applications).
- WF-7.** Management Guidance for Inventory and Monitoring
 - WF-7.A.** Continue appropriate monitoring of all riparian areas within the Planning Area, including greenline transects, riparian functionality assessments, etc.
 - WF-7.B.** Continue southwestern willow flycatcher habitat assessments at least every third year.
 - WF-7.C.** Continue southwestern willow flycatcher occurrence surveys at least every other year at all suitable habitat locations.
 - WF-7.D.** Implement nest monitoring to determine nesting success, parasitism rates, and predation rates
- WF-8.** Management Guidance for Fire Suppression and Related Actions
 - WF-8.A.** Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.
 - WF-8.B.** Except where fires are active in occupied habitat, minimize unnecessary low-level helicopter flights during the breeding season (April 1 – September 30). Approach bucket dip sites at a 90-degree direction to rivers to minimize flight

time over the river corridor and occupied riparian habitats. Locate landing sites for helicopters at least ¼ mile from occupied sites to avoid impacts to willow flycatchers and their habitat.

- WF-8.C.** Minimize use of chainsaws or bulldozers to construct firelines through occupied or suitable habitat except where necessary to reduce the overall acreage of occupied habitat or other important habitat areas that otherwise be burned.
- WF-8.D.** Implement activities to reduce hazardous fuels or improve riparian habitats (prescribed burning or vegetation treatments) within occupied or unsurveyed suitable habitat for southwestern willow flycatchers only during the non-breeding season (October 1 to March 31).
- WF-8.E.** Avoid developing access roads that result in fragmentation or a reduction in habitat quality. Close and rehabilitate all roads that were necessary for project implementation.
- WF-8.F.** Prescribed burning would only be allowed within ½ mile of occupied or unsurveyed suitable habitat when weather conditions allow smoke to disperse away from the habitat when birds may be present (breeding season of April 1 – September 30).
- WF-8.G.** Vegetation treatment projects adjacent to occupied or unsurveyed suitable habitat would only be conducted when willow flycatchers are not present (October 1 – March 31).
- WF-8.H.** Continue to implement the riparian fire management plan to minimize fire damage in riparian areas, especially those with suitable or potential flycatcher habitat.

2.3.3. Yuma clapper rail (FE)

Management Goals and Objectives

1. Continue to participate in the recovery of the Yuma clapper rail. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Preserve, protect, and manage rail habitat on the state and federal lands in the Planning Area.
3. Continue supporting and participating in Yuma clapper rail survey and monitoring efforts on lands in the Planning Area.
4. Work towards restoring native riparian vegetation in sites that have the potential to support future breeding habitat for this species.
5. Continue to support applications for instream flow rights with the Arizona Department of Water Resources in areas supporting Yuma clapper rail habitat.
6. Retain riparian area river channels, floodplains, and terraces in federal ownership. Carefully examine all exchanges that could affect water flows (either groundwater or surface water) to ensure that development on those lands not affect riparian habitats.

7. Continue to monitor habitat conditions in Yuma clapper rail habitat in order to be able to determine how best to manage these riparian areas to protect this and other riparian dependent species.
8. Carry out a program of public conservation education and planning directed towards preservation of rail habitat.

Conservation Measures for Yuma Clapper Rail

CR-1. Management Guidance for Achieving Habitat Objectives

CR-1.A. Maintain a policy of “no net loss” of riparian habitat.

CR-1.B. Protect occupied Yuma clapper rail habitats as a first priority.

CR-1.C. Maintain, enhance, restore, and/or create fresh water marsh habitat suitable for Yuma clapper rail nesting. Maintain a mosaic of uneven aged marsh vegetation. Avoid mechanical manipulation during the breeding season (April-June).

CR-1.D. Manage potential habitat to achieve structural and vegetation characteristics necessary to support increasing numbers of breeding Yuma clapper rails. Potential habitat should be managed to allow natural regeneration (through natural processes) into suitable habitat as rapidly as possible.

CR-1.E. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

CR-1.F. Continue to identify and map suitable and potential habitat areas for Yuma clapper rails.

CR-1.G. Close and rehabilitate roads and trails used by off-highway vehicles within riparian areas, or areas with the potential to support riparian vegetation.

CR-2. Management Guidance for Water Management

CR-2.A. Manage water diversions and groundwater withdrawals to maintain streamside vegetation.

CR-2.B. Where possible and practicable, reduce or eliminate physical stresses, such as high salinity or reduced stream flows that favor exotic plants. Do not authorize actions that not allow for natural stream flow regimes including periodic flood events.

CR-2.C. Net effects of land disposals/exchanges in the Virgin River corridor would be beneficial to the southwestern willow flycatcher. All land exchanges or disposals should benefit aquatic and riparian resources by reducing threats to those habitats associated with dewatering and surface disturbance.

CR-2.D. Lands to be acquired would have development potential similar to the disposed lands and would be located in similar proximity to the Virgin River or significant tributaries.

CR-2.E. All acquired lands would not have ground or surface water used or reserved for use by non-Federal interests after it is acquired by the government. All existing such uses must be terminated upon acquisition and all rights transferred to the Federal government.

- CR-2.F.** Parcels where future development likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange.
- CR-3.** Management Guidance for Control of Invasive Species
- CR-3.A.** Retain native riparian vegetation in floodplains or channels.
- CR-3.B.** Retain cattail marshes in occupied clapper rail habitat and, where appropriate, in suitable but unoccupied habitat.
- CR-4.** Management Guidance for Minimizing Human Disturbance
- CR-4.A.** Reduce or eliminate impacts to Yuma clapper rail and/or their habitat from recreational activities. Recreation that degrades riparian habitat would be prohibited in riparian areas on Bureau land along the Virgin River. Restrictions could include:
1. Reducing or eliminating recreational fires.
 2. Confining camping areas.
 3. Locate recreational activity areas away from suitable or potential southwestern willow flycatcher habitat.
 4. Minimize trash, debris, and other attractants to scavengers and/or predators.
 5. Provide on-site monitors where recreation conflicts exist.
- CR-5.** Management Guidance for Grazing Management
- CR-5.A.** Minimize or eliminate disturbance, injury, mortality, or other forms of take of Yuma clapper rail resulting from grazing by livestock.
- CR-5.B.** Exclude livestock grazing from occupied suitable Yuma clapper rail nesting habitat.
- CR-5.C.** In potential habitat, determine if livestock grazing is a major stressor or is otherwise preventing development of the habitat into suitable clapper rail habitat. Where this is the case, exclude livestock grazing from potential clapper rail habitat during the growing season (bud-break to leaf drop).
- CR-5.D.** Investigate grazing systems, strategies, and intensities for riparian recovery and maintenance.
- CR-5.E.** Investigate direct effects of livestock grazing on Yuma clapper rail and their habitat.
- CR-6.** Management Guidance for Use of Pesticides
- CR-6.A.** Determine impact of pesticide use on Yuma clapper rail reproduction adjacent to riparian areas.
- CR-6.B.** Limit or eliminate use of harmful pesticides adjacent to riparian areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad applications).
- CR-7.** Management Guidance for Inventory and Monitoring
- CR-7.A.** Continue appropriate monitoring of all riparian areas within the Planning Area, including greenline transects, riparian functionality assessments, etc.
- CR-7.B.** Continue Yuma clapper rail habitat assessments at least every third year.
- CR-7.C.** Continue Yuma clapper rail occurrence surveys at least every other year at all suitable habitat locations.

CR-8. Management Guidance for Fire Suppression and Related Actions

CR-8.A. Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

CR-8.B. Any prescribed fire or vegetation treatment project in occupied or suitable marsh habitat only occur between September 1 and March 15 to avoid the Yuma clapper rail breeding and molting seasons.

CR-8.C. Mechanical removal of overstory habitat (e.g. tamarisk) could occur as early as August 15, after the breeding season for Yuma clapper rails.

CR-8.D. Herbicide application would not occur in Yuma clapper rail habitat and drift-inhibiting agents would be used to assure that the herbicide does not enter adjacent marsh areas.

CR-8.E. Evaluate past surveys for Yuma clapper rails as part of the planning for prescribed fire projects. Post-project surveys should also be conducted to document the regrowth of cattail habitats and occupancy by clapper rails.

CR-8.F. After fire suppression is completed in Yuma clapper rail habitat, review any available survey records of the burn site and record in the fire report the number of rails recorded from the vicinity during these surveys.

2.3.4. Bald eagle (FT)**Management Goals and Objectives**

1. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Preserve, protect, and manage bald eagle habitat on state and federal lands in the Planning Area for bald eagle population maintenance and expansion.
3. Continue to monitor habitat conditions in bald eagle habitats in order to be able to determine how best to manage these areas to protect this and other species.
4. Carry out a program of public conservation education and planning directed towards preservation of bald eagle habitat.

Conservation Measures for Bald Eagle**BE-1. Management Guidance for Achieving Habitat Objectives**

BE-1.A. Maintain a policy of “no net loss” of bald eagle habitat.

BE-1.B. Protect occupied bald eagle habitats as a first priority.

BE-1.C. Identify, protect, and improve existing and potential habitat for bald eagle population continuance and expansion. Limit, modify, or relocate land use practices and developments which alter the character of the habitat that make it suitable for bald eagles.

BE-1.D. Maintain and upgrade suitable and potential habitats to insure they remain attractive to bald eagles.

BE-1.E. Analyze and monitor presently used winter roosting locations and the surrounding areas.

- BE-1.F.** Locate and map important foraging habitat of bald eagles within the Planning Area.
- BE-2.** Management Guidance for Achieving Population Objectives
 - BE-2.A.** Determine population numbers, distribution, and trends.
 - BE-2.B.** Determine patterns of movement for wintering eagles, including fledglings, immatures, and adults. Determine food habits for bald eagles within the Planning Area.
 - BE-2.C.** Limit, modify, or relocate habitat improvement projects within ½ mile of known bald eagle nest sites. Construction would be limited to the period between December 1 and June 30.
 - BE-2.D.** Limit, modify, or relocate habitat improvement projects within ¼ mile of known bald eagle winter roost areas. Construction would be limited to the period between October 15 and April 15.
 - BE-2.D.** Identify areas for construction of roost and perch poles in the Planning Area to replace natural roosts and perches lost by development or decay.
- BE-3.** Management Guidance for Use of Pesticides and Herbicides
 - BE-3.A.** Assess the effects of use pesticides and herbicides on bald eagles.
 - BE-3.B.** Reduce or eliminate use of harmful pesticides or herbicides within one mile of bald eagle use areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad applications).
- BE-4.** Management Guidance for Minimizing Human Disturbance
 - BE-4.A.** Reduce or eliminate impacts to bald eagles and/or their habitat from recreational activities.
 - BE-4.B.** To the extent practicable, minimize human activity within ½ mile of known bald eagle nest sites between December 1 and June 30.
 - BE-4.C.** To the extent practicable, minimize human activity within ¼ mile of known bald eagle winter roost areas between October 15 and April 15.
- BE-5.** Management Guidance for Inventory and Monitoring of Bald Eagles and Their Habitat.
 - BE-5.A.** Continue bald eagle habitat assessments at least every third year.
 - BE-5.B.** Continue bald eagle occurrence surveys at least every other year at all suitable habitat locations.
- BE-6.** Management Guidance for Fire Suppression and Related Actions
 - BE-6.A.** No human activity associated with fire management would be authorized within ½ mile of known bald eagle nest sites between December 1 and June 30.
 - BE-6.B.** No tree cutting would be authorized within ¼ mile of known bald eagle nest trees.
 - BE-6.C.** No human activity associated with fire management would be authorized within ¼ mile of known bald eagle winter roost areas between October 15 and April 15.
 - BE-6.D.** No tree cutting would be authorized within the area immediately around winter roost sites as determined by BLM biologists.
 - BE-6.E.** No helicopter or aircraft activity or aerial retardant application associated with fire management activities would be authorized within ½ mile of bald eagle nest

sites between December 1 and June 30 or winter roost sites between October 15 and April 15.

BE-6.F. Prescribed burn activities outside of nesting season would be conducted in a manner to ensure nest and winter roost sites are more than ½ mile from downwind smoke effects.

BE-6.G. Provide reasonable protective measures so fire prescription or fuels treatment would not consume dominant, large trees as identified by the Resource Advisor or qualified biologist approved by BLM within ½ mile of known nests and roosts of bald eagles. Pre-treatment efforts should provide reasonable protection of identified nesting and roosting trees.

BE-6.H. Prepare and implement BAER plans for burned areas that have the potential to cause future erosion problems in the watershed, riparian, or aquatic areas. Objectives of these plans, within watersheds containing bald eagle breeding areas and/or potential habitat, would be to reduce erosion and sedimentation into these habitats.

2.3.5 Mexican spotted owl (FT)

Management Goals, Objectives, and Actions

1. Continue to actively participate in the recovery of the Mexican spotted owl. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Preserve, protect, and manage Mexican spotted owl habitat on state and federal lands in the Planning Area for population expansion.
3. Continue to inventory and monitor conditions in Mexican spotted owl habitats in order to be able to determine how best to manage these areas.
4. Carry out a program of public conservation education and planning directed towards preservation of Mexican spotted owl habitat.

Conservation Measures for Mexican Spotted Owl

SO-1. Management Guidance for Achieving Habitat Objectives

SO-1.A. Maintain a policy of “no net loss” of Mexican spotted owl habitats.

SO-1.B. Identify, protect, and improve existing and potential habitat for Mexican spotted owl within the Planning Area. Limit, modify, or relocate land use practices and developments which alter the character of the habitat that make it suitable for spotted owls.

SO-1.C. Maintain and increase suitable habitats for Mexican spotted owls in the Planning Area. Suitable structural characteristics may be achieved through restoring, maintaining, enhancing, and creating habitat. Suitable spotted owl habitats should be managed so their suitable characteristics are not eliminated or degraded. Manage for large, contiguous blocks of habitat rather than for small fragmented areas. Enhance connectivity to currently isolated suitable sites. Encourage the use of buffer zones between riparian habitats and adjacent upland areas.

- SO-1.D.** Manage potential habitat to achieve structural and vegetation characteristics necessary to support Mexican spotted owl within 5-20 years. Allow natural regeneration (through natural processes) into suitable habitat as rapidly as possible.
- SO-1.E.** Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.
- SO-2.** Management Guidance for Minimizing Human Disturbance
- SO-2.A.** Assess the presence and intensity of allowable recreational activities within owl habitat. Seasonal closures of specifically designated recreation activities should be considered where appropriate.
- SO-3.** Management Guidance for Grazing Management
- SO-3.A.** Determine the effectiveness of current grazing standards and guidelines as they relate to the owl's needs, and devise grazing strategies that can benefit the owl and its prey.
- SO-3.B.** Monitor grazing use by livestock to determine any changes in the relative composition of herbaceous and woody plants to maintain habitat for owls and their prey.
- SO-3.C.** Minimize or eliminate disturbance, injury, mortality, or other forms of take of Mexican spotted owls resulting from grazing by livestock.
- SO-4.** Management Guidance for Inventory and Monitoring
- SO-4.A.** Continue to implement the habitat monitoring program detailed in the owl recovery plan.
- SO-5.** Management Guidance for Fire Suppression and Related Actions
- SO-5.A.** BLM wildlife biologists would be involved early in the decision-making process for fuels management treatments (wildland fire use, prescribed fires, vegetation treatments) that are planned within suitable habitat for Mexican spotted owls.
- SO-5.B.** Suitable habitat for Mexican spotted owls would be surveyed prior to implementing prescribed fire or vegetation treatment activities on BLM-administered lands to determine if owls are present and their breeding status. These fire management activities would only be implemented within suitable habitat if birds are not present.
- SO-5.C.** If a spotted owl is discovered during fire suppression or fuels treatment activities (wildland fire use, prescribed fire, vegetation treatments), the Resource Advisor or a qualified wildlife biologist would document the find and assess potential harm to the owl and advise the Incident Commander or project crew boss of methods to prevent harm. The information would include for each owl the location, date, and time of observation and the general condition of the owl. The Resource Advisor or biologist would contact the appropriate USFWS office.

SO-5.D. The following measures would be followed in suitable habitat (occupied or unoccupied) whenever consistent with objectives to reduce hazardous fuels:

1. Incorporate natural variation, such as irregular tree spacing and various stand/patch sizes, into management prescriptions and attempt to mimic natural disturbance patterns.
2. Maintain all species of native vegetation in the landscape, including early seral species. To allow for variation in existing stand structures and provide species diversity, both uneven-aged and even-aged systems may be used as appropriate.
3. Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure.
4. Retain hardwoods, large down logs, large trees, and snags. Emphasize a mix of size and age classes of trees. The mix should include large mature trees, vertical diversity, and other structural and floristic characteristics that typify natural forest conditions.

SO-6 The effects of fire suppression and fuels treatment activities on Mexican spotted owls and their habitat, and the effectiveness of these conservation measures, would be assessed after each fire event or fuels treatment project by the Resource Advisor or local biologist to allow evaluation of these guidelines. Prescriptions for wildland fire use, prescribed fires, and vegetation treatments would be adjusted, if necessary.

2.3.6. Yellow-billed cuckoo (FC)

Management Goals and Objectives

1. Continue to participate in conservation efforts for the yellow-billed cuckoo.
2. Preserve, protect, and manage cuckoo habitat on state and federal lands in the Planning Area.
3. Continue supporting and participating in yellow-billed cuckoo survey and monitoring efforts on lands within the Planning Area.
4. Restore native riparian vegetation in sites that have the potential to support future breeding habitat for this species.
5. Continue to support applications for instream flow rights with the Arizona Department of Water Resources in areas supporting yellow-billed cuckoo habitat.
6. Retain riparian area river channels, floodplains, and terraces in federal ownership. Carefully examine all exchanges that could affect water flows (either groundwater or surface water) to ensure that development on those lands not affect riparian habitats.
7. Continue to monitor habitat conditions in yellow-billed cuckoo habitat in order to be able to determine how best to manage these riparian areas to protect this and other riparian dependent species.
8. Carry out a program of public conservation education and planning directed towards preservation of cuckoo habitat.

Conservation Measures for Yellow-billed Cuckoo**YC-1. Management Guidance for Achieving Habitat Objectives**

YC-1.A. Maintain a policy of “no net loss” of riparian habitat.

YC-1.B. Protect occupied yellow-billed cuckoo habitats as a first priority.

YC-1.C. Maintain, enhance, restore, and/or create mature cottonwood-willow gallery forest habitat suitable for yellow-billed cuckoo nesting. Manage for large, contiguous blocks of habitat (>15 ha) in conjunction with removal of competing exotic species (i.e. salt cedar). Encourage the use of buffer zones between riparian habitats and adjacent development. Establish corridors between “islands” of suitable habitat to allow natural dispersal and recolonization of historic habitats.

YC-1.D. Manage potential habitat to achieve structural and vegetation characteristics necessary to support increasing numbers of breeding yellow-billed cuckoo. Potential habitat should be managed to allow natural regeneration (through natural processes) into suitable habitat as rapidly as possible.

YC-1.E. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

YC-1.F. Continue to identify and map suitable and potential habitat areas for yellow-billed cuckoo.

YC-1.G. Close and rehabilitate roads and trails used by off-highway vehicles within riparian areas, or areas with the potential to support riparian vegetation.

YC-2. Management Guidance for Water Management

YC-2.A. Manage water diversions and groundwater withdrawals to maintain streamside vegetation.

YC-2.B. Where possible and practicable, reduce or eliminate physical stresses, such as high salinity or reduced stream flows that favor exotic plants. Do not authorize actions that not allow for natural stream flow regimes including periodic flood events.

YC-2.C. Net effects of land disposals/exchanges in the Virgin River corridor would be beneficial to yellow-billed cuckoo. All land exchanges or disposals should benefit aquatic and riparian resources by reducing threats to those habitats associated with dewatering and surface disturbance.

YC-2.D. Lands to be acquired would have development potential similar to the disposed lands and would be located in similar proximity to the Virgin River or significant tributaries.

YC-2.E. All acquired lands would not have ground or surface water used or reserved for use by non-Federal interests after it is acquired by the government. All existing such uses must be terminated upon acquisition and all rights transferred to the Federal government.

- YC-2.F.** Parcels where future development likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange.
- YC-2.G.** Where practicable, maintain flow regimes that mimic natural level and timing of high and low water to allow accumulation of sediments and subsequent establishment of seedlings.
- YC-3. Management Guidance for Control of Invasive Species**
- YC-3.A.** Retain native riparian vegetation in floodplains or channels.
- YC-3.B.** Retain mature cottonwood-willow gallery forests in yellow-billed cuckoo habitat.
- YC-4. Management Guidance for Minimizing Human Disturbance**
- YC-4.A.** Reduce or eliminate impacts to yellow-billed cuckoo and/or their habitat from recreational activities. Recreation that degrades riparian habitat would be prohibited in riparian areas on Bureau land along the Virgin River. Restrictions could include:
1. Reducing or eliminating recreational fires.
 2. Confining camping areas.
 3. Locate recreational activity areas away from suitable or potential cuckoo habitat.
 4. Minimize trash, debris, and other attractants to scavengers and/or predators.
- YC-4.B.** Avoid intense and repeated human disturbance at nesting areas from 15 May through 1 September.
- YC-5. Management Guidance for Grazing Management**
- YC-5.A.** Minimize or eliminate disturbance, injury, or mortality of yellow-billed cuckoo resulting from grazing by livestock.
- YC-5.B.** Investigate grazing systems, strategies, and intensities for riparian recovery and maintenance.
- YC-5.E.** Investigate direct effects of livestock grazing on yellow-billed cuckoo and their habitat. Closely monitor grazing impacts on cottonwood and willow seedlings in riparian systems and reduce or remove grazing when seedlings are being impacted.
- YC-6. Management Guidance for Use of Pesticides**
- YC-6.A.** Determine impact of pesticide use on yellow-billed cuckoo reproduction adjacent to riparian areas.
- YC-6.B.** Limit or eliminate use of harmful pesticides adjacent to riparian areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad
- YC-7. Management Guidance for Inventory and Monitoring**
- YC-7.A.** Continue appropriate monitoring of all riparian areas within the Planning Area, including greenline transects, riparian functionality assessments, etc.
- YC-7.B.** Continue yellow-billed cuckoo habitat assessments at least every third year.
- YC-7.C.** Continue yellow-billed cuckoo occurrence surveys at least every other year at all suitable habitat locations.

YC-8. Management Guidance for Fire Suppression and Related Actions

YC-8.A. Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

YC-8.B. Any prescribed fire or vegetation treatment project in occupied or suitable marsh habitat only occur between September 1 and March 15 to avoid adverse affects to breeding birds.

YC-8.C. Mechanical removal of overstory habitat (e.g. tamarisk) could occur as early as September 1, after the breeding season for yellow-billed cuckoos.

YC-8.D. Evaluate past surveys for yellow-billed cuckoos as part of the planning for prescribed fire projects. Post-project surveys should also be conducted to document the regrowth of mature cottonwood-willow gallery forests and occupancy by cuckoos.

YC-8.F. After fire suppression is completed in yellow-billed cuckoo habitat, review any available survey records of the burn site and record in the fire report the number of cuckoos recorded from the vicinity during these surveys.

WF-8.H. Continue to implement the riparian fire management plan to minimize fire damage in riparian areas, especially those with suitable or potential flycatcher habitat.

2.3.7. Peregrine Falcon (BLM Sensitive)**Management Goals, Objectives, and Actions**

1. Continue to actively participate in the post-delisting recovery monitoring of peregrine falcons in the Planning Area.
2. Preserve, protect, and manage peregrine falcon habitat on state and federal lands in the Planning Area for population expansion.
3. Carry out a program of public conservation education and planning directed towards preservation of peregrine falcon habitat.

Conservation Measures for Peregrine Falcon**PF-1. Management Guidance for Achieving Population Objectives**

PF-1.A. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

PF-2. Management Guidance for Minimizing Human Disturbance

PF-2.A. Assess the presence and intensity of allowable recreational activities within owl habitat. Seasonal closures of specifically designated recreation activities should be considered where appropriate.

PF-2.B. Limit, modify, or relocate authorized actions, including construction projects, to areas more than ½ mile of known peregrine falcon during the active nesting season between April 15 and August 15.

PF-3. Management Guidance for Inventory and Monitoring

PF-3.A. Continue post-delisting recovery monitoring of selected peregrine falcon nest sites in cooperation with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. The monitoring plan calls for five sampling periods at three-year intervals throughout the life of this RMP. Monitoring protocol requires a minimum of two, four-hour visits to a site unless a nest is located sooner.

PF-4. Management Guidance for Fire Suppression and Related Actions

PF-4.A. BLM wildlife biologists would be involved early in the decision-making process for fuels management treatments (wildland fire use, prescribed fires, vegetation treatments) that are planned within ½ mile of active nest sites of peregrine falcon.

PF-4.B. Prior to implementing prescribed fire or vegetation treatment activities on BLM-administered lands, areas within ½ mile of cliff faces that could contain suitable habitat for peregrine falcon would be surveyed. Fire management activities would only be implemented when peregrine falcons are not present.

PF-4.C. If a peregrine falcon is discovered during fire suppression or fuels treatment activities (wildland fire use, prescribed fire, vegetation treatments), the Resource Advisor or a qualified wildlife biologist would document the find, assess potential harm to the falcon, and advise the Incident Commander or project crew boss of methods to prevent harm.

2.4. Virgin River Fishes (VF)

2.4.1. Virgin River chub (FE, CH) and Woundfin Minnow (FE, CH)

Management Goals and Objectives

1. Continue to actively participate in the recovery of Virgin River fishes. Assist in implementation of recovery tasks identified in the Recovery Plan.
2. Provide protection from threats and create/secure sufficient habitat to assure maintenance of these populations and/or habitats over time.
3. Continue supporting and participating in monitoring efforts for Virgin River fishes on lands in the Planning Area.
4. Continue to support applications for instream flow rights with the Arizona Department of Water Resources in rivers supporting willow flycatcher habitat.
5. Retain riparian area river channels, floodplains, and terraces in federal ownership. Carefully examine all exchanges that could affect water flows (either groundwater or surface water) to ensure that development on those lands not affect riparian habitats.
6. Educate employees and public users about Virgin River fishes.

Conservation Measures for Virgin River Fishes**VF-1. Management Guidance for Achieving Habitat Objectives**

VF-1.A. Maintain a policy of “no net loss” of riparian habitat.

VF-1.B. Maintain and increase riparian habitats for Virgin River fishes. Suitable structural characteristics may be achieved through restoring, maintaining, enhancing, and creating habitat. Encourage the use of buffer zones between riparian habitats and adjacent upland areas. Promote establishment of areas of slow/back waters.

VF-1.C. Promote regeneration of native species in regenerating riparian habitats. Restore natural reaches of riparian habitat by restoring intervening degraded segments. In accordance with guideline 3-1 of Standard 3 of the Arizona Standards and Guidelines habitat restoration in riparian areas should not include planting or seeding of nonnative plants.

VF-1.D. Close and rehabilitate roads and trails used by off-highway vehicles within riparian areas, or areas with the potential to support riparian vegetation.

VF-2. Management Guidance for Water Management

VF-2.A. Manage water diversions and groundwater withdrawals to maintain streamside vegetation.

VF-2.B. Where possible and practicable, reduce or eliminate physical stresses, such as high salinity or reduced stream flows that favor exotic plants. Do not authorize actions that not allow for natural stream flow regimes including periodic flood events.

VF-2.C. Net effects of land disposals/exchanges in the Virgin River corridor would be beneficial to Virgin River fishes. All land exchanges or disposals should benefit aquatic and riparian resources by reducing threats to those habitats associated with dewatering and surface disturbance.

VF-2.D. Lands to be acquired would have development potential similar to the disposed lands and would be located in similar proximity to the Virgin River or significant tributaries.

VF-2.E. All acquired lands would not have ground or surface water used or reserved for use by non-Federal interests after it is acquired by the government. All existing such uses must be terminated upon acquisition and all rights transferred to the Federal government.

VF-2.F. Parcels where future development likely result in appreciable reductions in groundwater flow into the Virgin River or Beaver Dam Wash not be sold or exchanged. A study of groundwater hydrology could be required prior to sale or exchange.

VF-3. Management Guidance for Control of Invasive Exotic Species

VF-3.A. Retain native riparian vegetation in floodplains or channels.

VF-3.B. In habitats where exotic species are to be removed through chemical or mechanical means, use a temporally staged approach to clear areas so some mature habitat remains throughout the restoration period for cover and shade for Virgin River fishes.

- VF-4. Management Guidance for Minimizing Human Disturbance**
- VF-4.A.** Reduce or eliminate impacts to Virgin River fishes and their habitat from recreational activities. Recreation that degrades riparian habitat would be prohibited in riparian areas on Bureau land along the Virgin River.
- VF-5. Management Guidance for Grazing Management**
- VF-5.A.** Minimize or eliminate disturbance, injury, mortality, or other forms of take of Virgin River fishes resulting from grazing by livestock.
 - VF-5.B.** Investigate grazing systems, strategies, and intensities for riparian recovery and maintenance.
 - VF-5.C.** Investigate direct effects of livestock grazing on Virgin River fishes and their habitat.
- VF-6. Management Guidance for Pesticide Issues**
- VF-6.A.** Determine impact of pesticide use on Virgin River fishes.
 - VF-6.B.** Limit or eliminate use of harmful pesticides adjacent to riparian areas. If used, apply in a manner that avoids drift, according to directions (i.e. not broad applications).
- VF-7. Management Guidance for Inventory and Monitoring**
- VF-7.A.** Continue appropriate monitoring of all riparian areas within the Planning Area, including greenline transects, riparian functionality assessments, etc.
 - VF-7.B.** Continue monitoring Virgin River fishes within the Planning Area in cooperation with the Virgin River Fishes Recovery Team and the U.S. Fish and Wildlife Service.
- VF-8. Management Guidance for Fire Suppression and Related Actions**
- VF-8.A.** Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.
 - VF-8.B.** Minimize fire damage in riparian by giving riparian habitat the highest priority for fire response and suppression efforts (second only to human life and property). Focus attention on minimizing fire damage to stands of native vegetation areas.
 - VF-8.C.** Using natural barriers or openings in riparian vegetation is the easiest, safest method to manage a riparian wildfire. Where possible and practical, use wet fire breaks in developing or sandy overflow channels rather than dry breaks.
 - VF-8.D.** Where possible, avoid use chainsaws and/or bulldozers to construct fireline through habitat. When necessary to do so, weigh the potential impacts of such an action against the habitat losses likely to result. Consider firefighter safety and potential gains in managing the fire.
 - VF-8.E.** Avoid use of backfires during fire suppression activities except where doing so reduces the overall in these areas except where necessary to reduce or eliminate severe fire risk.
 - VF-8.F.** Avoid use of chemical foams or retardants in riparian areas.
 - VF-8.G.** Avoid developing access roads that result in fragmentation or a reduction in habitat quality. Close and rehabilitate all roads that were necessary for project implementation.

VF-8.H. Cooperate with other agencies to develop emergency protocols to decrease the impacts of fire suppression and fuels treatment activities on Federally listed fish species.

2.5. Flowering Plants

Management Goals and Objectives

1. Continue to participate in conservation efforts for special status plant species.
2. Preserve, protect, and manage special status plant habitat on state and federal lands in the Planning Area.
3. Continue monitoring efforts for special status plant populations within the Planning Area.
4. Carry out a program of public conservation education and planning directed towards preservation of special status plant habitat.

Conservation Measures for Special Status Plant

PL-1. Management Guidance for Achieving Habitat Objectives

PL-1.A. Maintain a policy of “no net loss” of special status plant habitats.

PL-2. Management Guidance for Minimizing Human Disturbance

PL-2.A. Reduce or eliminate impacts to special status plants and their habitats from surface disturbing activities.

PL-2.B. Recreational activities that degrade special status plant habitats would be modified or relocated to minimize or eliminate adverse affects.

PL-2.C. Close special status plant ACECs to OHV use. In these ACECs, vehicles would not be allowed to pull off the road to camp. Campfires and collection of fuel wood not be authorized in these ACECs.

PL-3. Management Guidance for Grazing Management

PL-3.A. Minimize or eliminate disturbance, injury, or mortality of special status plants resulting from grazing by livestock.

PL-3.B. Investigate direct effects of livestock grazing on special status plants and their habitats.

PL-3.C. Where grazing by livestock is leading to adverse affects from trampling, implement actions to reduce or mitigate loss of the plant species. Measures could include fencing, seasonal restrictions, or relocation of livestock developments.

PL-3.D. Implement public conservation education programs to inform publics of the value conservation of special status plant habitats and the rules and policies governing their protection.

PL-4. Management Guidance for Use of Herbicides

PL-4.A. Determine impact of herbicides pesticide use on special status plant species.

PL-4.B. Limit or eliminate use of harmful herbicides in areas where special status plants could be affected.

PL-5. Management Guidance for Inventory and Monitoring

PL-5.A. Inventory and map all suitable habitat of special status plant species.

PL-5.B. Continue appropriate monitoring of all special status plant species within the Planning Area.

PL-6. Management Guidance for Fire Suppression and Related Actions

PL-6.A. Known locations and potential habitat for plant populations would be mapped to facilitate planning for wildland fire use, prescribed fires, and vegetation treatments, and to ensure protection of these populations during fire suppression.

PL-6.B. Delineate buffer areas around plant populations prior to prescribed fire and vegetation treatment activities. Coordinate with USFWS during any emergency response and wildland fire use activities to ensure protection of plant populations from fire and fire suppression activities.

PL-6.C. No staging of equipment or personnel would be permitted within 100 meters of identified individuals or populations of special status plant species during fire suppression, wildland fire use, or prescribed fire. Off-road vehicles would not be allowed within the 100-meter buffer area, unless necessary for firefighter or public safety or the protection of property, improvements, or other resources.

PL-6.D. No prescribed burning would be implemented within 100 meters of identified locations or unsurveyed suitable habitat of special status plant species unless specifically designed to maintain or improve the existing population.

PL-5 Management Plan and the...
PL-5-B. Certain...
Young Area

PL-4 Management...
PL-4-A. Known...
PL-4-B. Certain...
PL-4-C. Certain...
PL-4-D. Certain...

APPENDIX 2.F

SPECIAL STATUS SPECIES KNOWN OR SUSPECTED TO OCCUR ON THE ARIZONA STRIP

PL-5 Management Plan and the...
PL-5-B. Certain...
Young Area
PL-4 Management...
PL-4-A. Known...
PL-4-B. Certain...
PL-4-C. Certain...
PL-4-D. Certain...
PL-4-E. Certain...
PL-4-F. Certain...
PL-4-G. Certain...
PL-4-H. Certain...
PL-4-I. Certain...
PL-4-J. Certain...
PL-4-K. Certain...
PL-4-L. Certain...
PL-4-M. Certain...
PL-4-N. Certain...
PL-4-O. Certain...
PL-4-P. Certain...
PL-4-Q. Certain...
PL-4-R. Certain...
PL-4-S. Certain...
PL-4-T. Certain...
PL-4-U. Certain...
PL-4-V. Certain...
PL-4-W. Certain...
PL-4-X. Certain...
PL-4-Y. Certain...
PL-4-Z. Certain...

SPECIAL STATUS SPECIES KNOWN OR SUSPECTED TO OCCUR ON THE ARIZONA STRIP				
COMMON NAME (SCIENTIFIC NAME)	OCCURRENCE	FED. LISTING	STATE STATUS	BLM SENSITIVE
INVERTEBRATES				
Grand Wash springsnail (<i>Pyrgulopsis bacchus</i>)	Verified		WSC	Sensitive
Desert springsnail (<i>Pyrgulopsis deserta</i>)	Verified		WSC	Sensitive
MacNeill sooty wing skipper (<i>Hesperopsis graciellae</i>)	Possible			Sensitive
Succineid snails (all species in family Succineidae)	Verified			Sensitive
FISH				
Woundfin (<i>Plagopterus argentissimus</i>)	Verified	E	WSC	
Virgin chub (<i>Gila semimida</i>)	Verified	E	WSC	
Virgin spinedace (<i>Lepidomeda mollispinis mollispinis</i>)	Verified	CA.	WSC	
Flannelmouth sucker (<i>Catostomus latipinnis</i>)	Verified		WSC	
Desert sucker (<i>Catostomus clarki</i>)	Verified			Sensitive
Speckled dace (<i>Rhinichthys osculus</i>)	Verified			Sensitive
REPTILES AND AMPHIBIANS				
Desert tortoise (<i>Gopherus agassizii</i>)	Verified	T	WSC	
Relict leopard frog (<i>Rana onca</i>)	Verified	C	WSC	
Northern leopard frog (<i>Rana pipiens</i>)	Verified		WSC	
Lowland leopard frog (<i>Rana yavapaiensis</i>)	Possible?		WSC	
Chuckwalla (<i>Sauromalus obesus</i>)	Verified			Sensitive
Banded Gila monster (<i>Heloderma suspectum cinctum</i>)	Verified			Sensitive
Northern sagebrush lizard (<i>Sceloporus graciosus graciosus</i>)	Verified			Sensitive
BIRDS				
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Verified	T	WSC	
California condor (<i>Gymnogyps californianus</i>)	Verified	E	WSC	
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Verified	T	WSC	

SPECIAL STATUS SPECIES KNOWN OR SUSPECTED TO OCCUR ON THE ARIZONA STRIP				
COMMON NAME (SCIENTIFIC NAME)	OCCURRENCE	FED. LISTING	STATE STATUS	BLM SENSITIVE
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Verified	E	WSC	
Yuma clapper rail (<i>Rallus longirostris yumanensis</i>)	Verified	E	WSC	
Western yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>)	Verified	C	WSC	
American bittern (<i>Botaurus lentiginosus</i>)	Verified		WSC	
Ferruginous hawk (<i>Buteo regalis</i>)	Verified		WSC	
Fulvous whistling duck (<i>Dendrocygna bicolor</i>)	Verified			Sensitive
Loggerhead shrike (<i>Lanius ludoviscianus</i>)	Verified			Sensitive
Northern goshawk (<i>Accipiter gentilis</i>)	Verified		WSC	
Snowy egret (<i>Egretta thula</i>)	Verified		WSC	
Western burrowing owl (<i>Athene cunicularia hypugea</i>)	Verified			Sensitive
White-faced ibis (<i>Plegadis chihi</i>)	Verified			Sensitive
Allen's big-eared bat (<i>Idionycteris phyllotis</i>)	Verified			Sensitive
Big free-tailed bat (<i>Nyctinomops macrotis</i>)	Verified			Sensitive
California leaf-nosed bat (<i>Macrotus californicus</i>)	Verified			Sensitive
Fringed myotis (<i>Myotis thysanodes</i>)	Verified			Sensitive
Greater western mastiff bat (<i>Eumops perotis</i>)	Verified		WSC	
Long-eared myotis (<i>Myotis evotis</i>)	Verified			Sensitive
Long-legged myotis (<i>Myotis volans</i>)	Verified			Sensitive
Small-footed myotis (<i>Myotis ciliolabrum</i>)	Verified			Sensitive
Spotted bat (<i>Euderma maculatum</i>)	Verified			Sensitive
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	Verified		WSC	
Western red bat (<i>Lasiurus blossevillii</i>)	Possible		WSC	
House Rock Valley chisel-toothed kangaroo rat (<i>Dipodomys microps leucotis</i>)	Verified			Sensitive

SPECIAL STATUS SPECIES KNOWN OR SUSPECTED TO OCCUR ON THE ARIZONA STRIP				
COMMON NAME (SCIENTIFIC NAME)	OCCURRENCE	FED. LISTING	STATE STATUS	BLM SENSITIVE
PLANTS				
Brady pincushion cactus (<i>Pediocactus bradyi</i>)	Verified	E		
Holmgren milk-vetch (<i>Astragalus holmgreniorum</i>)	Verified	E		
Jones' cycladenia (<i>Cycladenia humilis</i> var. <i>jonesii</i>)	Verified	T		
Siler pincushion cactus (<i>Pediocactus sileri</i>)	Verified	T		
Welsh's milkweed (<i>Asclepias welshii</i>)	Verified	T		
Fickeisen plains cactus (<i>Pediocactus peeblesianus</i> var. <i>fickeiseniae</i>)	Verified	C		Sensitive
Black Rock daisy (<i>Townsendia smithii</i>)	Verified			Sensitive
Cliff milkvetch (<i>Astragalus crennophylax</i> var. <i>myriorrhaphus</i>)	Verified			Sensitive
Diamond Butte milkvetch (<i>Astragalus toanus</i> var. <i>scidulus</i>)	Verified			Sensitive
Grand Canyon rose (<i>Rosa stellata</i> var. <i>abyssa</i>)	Verified			Sensitive
Kaibab pincushion cactus (<i>Pediocactus paradinei</i>)	Verified			Sensitive
Mt. Trumbull beardtongue (<i>Penstemon distans</i>)	Verified			Sensitive
Paria Plateau fishhook cactus (<i>Sclerocactus sileri</i>)	Verified			Sensitive
September 11 stickleaf (<i>Mentzelia memorabilis</i>)	Verified			Sensitive
Sheep Range beardtongue (<i>Penstemon petiolatus</i>)	Verified			Sensitive
Silverleaf sunray (<i>Enceliopsis argophylla</i>)	Verified			Sensitive
Sticky wild buckwheat (<i>Eriogonum viscidulum</i>)	Verified			Sensitive
Three hearts (<i>Tricardia watsonii</i>)	Possible			Sensitive
Federal Listing: E = Endangered; T = Threatened; C = Candidate; CA = Conservation Agreement State Status: WSC = Wildlife Species of Concern				

Migratory Birds of the Arizona Strip

Habitat: G=Grassland, S=Sagebrush, M=Mountain Shrub, C=Conifer, PJ=Pinyon-Juniper, D=Desert Shrub, A=Aquatic, R=Riparian

<i>Summer Migrants</i>	<i>Habitat</i>	<i>Summer Migrants</i>	<i>Habitat</i>
Common Black Hawk	R	Sage Thrasher	S, D
Swainson's Hawk	D	Bendire's Thrasher	G, S, M, PJ, D
Clapper Rail (Yuma)	A, R	Crissal's Thrasher	S, D
Band-tailed Pigeon	M, C	LeConte's Thrasher	D
White-winged Dove	D, R	Orange-crowned Warbler	S, M, C, PJ, D
Inca Dove	D, R	Virginia's Warbler	M, PJ, D
Yellow-billed Cuckoo (western)	D, R	Lucy's Warbler	PJ, D, R
Elf Owl	M, C, PJ, D	Yellow Warbler	M, C, R
Burrowing Owl	G, S, D	Yellow-rumped Warbler	M, C, PJ
Lesser Nighthawk	G, S, M, C, PJ, D	Black-throated Gray Warbler	M, PJ
Common Nighthawk	G, S, M, C, PJ, D	Grace's Warbler	C, PJ
Common Poorwill	G, S, M, C, PJ, D	MacGillivray's Warbler	M, C, PJ
Black Swift	M, C, PJ	Common Yellowthroat	S, M, R
Vaux's Swift	M, C, PJ	Yellow-breasted Chat	C, PJ, R
White-throated Swift	G, S, M, C, PJ, D	Hepatic Tanager	M, C, PJ
Black-chinned Hummingbird	G, S, M, C, PJ, D	Summer Tanager	M, C, R
Costa's Hummingbird	G, S, PJ, D	Western Tanager	M, C, PJ
Broad-tailed Hummingbird	G, S, D	Green-tailed Towhee	S, M, PJ, D, R
Olive-sided Flycatcher	C, PJ	Rufous-crowned Sparrow	S, D
Western Wood-pewee	C, R	Brewer's Sparrow	G, S, M, D
SW Willow Flycatcher	R	Vesper's Sparrow	G, S, D
Gray Flycatcher	S, PJ	Lark Sparrow	G, S, D
Dusky Flycatcher	M, C, PJ, R	Black-throated Sparrow	G, S, M, PJ, D
Cordilleran Flycatcher	M, C, PJ	Black-headed Grosbeak	M, C, PJ
Vermillion Flycatcher	D, R	Blue Grosbeak	R
Dusky-capped Flycatcher	G, S, M, C, PJ, D, R	Lazuli Bunting	M, C, R
Ash-throated Flycatcher	G, S, M, C, PJ, D, R	Brewer's Blackbird	G, S, M, C, PJ, D, R
Brown-crested Flycatcher	D	Great-tailed Grackle	G, D
Cassin's Kingbird	G, S, M, C, PJ, D	Brown-headed Cowbird	G, S, M, C, D
Western Kingbird	G, S, M, C, PJ, D	Hooded Oriole	R
Bell's Vireo	D, R	Bullock's Oriole	M, PJ
Gray Vireo	M, PJ, D	Scott's Oriole	G, S, M, PJ, D
Plumberous Vireo	C, PJ		
Warbling Vireo	C, R	<i>Winter Migrants</i>	<i>Habitat</i>
Tree Swallow	G, S, M, C, PJ, D	Canada Goose	G, A, R
Violet-green Swallow	G, S, M, C, PJ, D	Bald Eagle	G, S, C
Northern Rough-winged Swallow	G, S, M, D	Rough-legged Hawk	G, S, M, PJ, D
Cliff Swallow	G, S, M, D	Merlin	G, S, PJ
Barn Swallow	G, M, D	Gilded Flicker	PJ
House Wren	M, C, PJ	Northern Shrike	S, M, PJ, D
Blue-gray Gnatcatcher	M, C, PJ, D	Winter Wren	C
Black-tailed Gnatcatcher	D	Marsh Wren	R
Hermit Thrush	M, C, PJ	Black and White Warbler	C, PJ
Gray Catbird	M, C, PJ	White-throated Sparrow	G, S, M, C, PJ, D
Northern Mockingbird	G, S, M, PJ, D	Harris's Sparrow	C, PJ

<i>Transient</i>	<i>Habitat</i>	<i>Transient</i>	<i>Habitat</i>
Greater White-fronted Goose	A, R	American Avocet	A, R
Snow Goose	A, R	Greater Yellowlegs	A, R
Tundra Swan	A	Lesser Yellowlegs	A, R
Wood Duck	A, R	Solitary Sandpiper	A, R
Gadwall	A, R	Willet	A, R
American Wigeon	A, R	Long-billed Curlew	A, R
Mallard	A, R	Marbled Godwit	A, R
Blue-winged Teal	A, R	Sanderling	A, R
Cinnamon Teal	A, R	Semi-palmated Sandpiper	A, R
Northern Shoveler	A, R	Western Sandpiper	A, R
Northern Pintail	A, R	Least Sandpiper	A, R
Green-winged Teal	A, R	Baird's Sandpiper	A, R
Canvasback	A, R	Pectoral Sandpiper	A, R
Redhead	A, R	Dunlin	A, R
Ring-necked Duck	A, R	Long-billed Dowitcher	A, R
Greater Scaup	A, R	Common Snipe	A, R
Lesser Scaup	A, R	Wilson's Phalarope	A, R
Bufflehead	A, R	Red-necked Phalarope	A, R
Common Goldeneye	A, R	Franklin's Gull	A
Barrow's Goldeneye	A, R	Bonaparte's Gull	A
Common Merganser	A, R	Ring-billed Gull	A
Red-breasted Merganser	A, R	California Gull	A
Ruddy Duck	A, R	Herring Gull	A
Common Loon	A	Caspian Tern	A
Pied-billed Grebe	A, R	Common Tern	A
Horned Grebe	A, R	Forster's Tern	A
Eared Grebe	A, R	Black Tern	A
Western Grebe	A, R	Short-eared Owl	G, D
American White Pelican	A	Anna's Hummingbird	G, S, M, C, PJ, D
Double-crested Cormorant	A	Calliope Hummingbird	G, S, M, D
American Bittern	A, R	Rufous Hummingbird	G, S, M, PJ, D
Great Blue Heron	A, R	Bank Swallow	S, M, D
Great Egret	A, R	European Starling	G, S, M, C, PJ, D
Snowy Egret	A, R	American Pipit	G, R
Cattle Egret	G, R	Bohemian Waxwing	C, PJ
Green Heron	A, R	Cedar Waxwing	C, PJ, R
Black-crowned Night Heron	G, A, R	Magnolia Warbler	C
White-faced Ibis	A, R	Townsend's Warbler	C, PJ
Osprey	A, R	Hermit Warbler	C
Zone-tailed Hawk	G, S, M, D	American Redstart	M
Ferruginous Hawk	G, S, PJ, D	Wilson's Warbler	M, C, PJ, R
Virginia Rail	A, R	Painted Redstart	M, C, PJ
Sora	A, R	Abert's Towhee	G, R
American Coot	A, R	Cassin's Sparrow	G, S
Sandhill Crane	A, R	Black-chinned Sparrow	S, M
Black-bellied Plover	A, R	Lark Bunting	G, S, M, D
Snowy Plover	A, R	Lincoln's Sparrow	D, R
Semi-palmated Plover	A, R	Golden Crowned Sparrow	G, S, M, D
Mountain Plover	G	Pyrrhuloxia	D, R
Black-necked Stilt	A, R	Indigo Bunting	M, C, R

Transient

Habitat

Yellow-headed Blackbird	A, R
Rusty Blackbird	C, R
Pine Grosbeak	C
Purple Finch	G, S, M, C, PJ, D

I. Introduction

- Purpose of the Plan
- Reason for Approval
- Accomplishments of the Plan
- Policies and Procedures
- Relationship of the Plan to other Plans
- Other Plans
- Other Agencies
- Other Organizations
- Other Groups

II. Environmental Management Plan Components

- Physical Plan
- Biological Plan
- Vegetation Management
- Wildlife Management
- Recreation Management

III. Land State Administration

IV. Management Units, Categories, and Plans

- Wildlife State Development
- Vegetation Management
- Special Use Plans
- Big Game Plans
- Migratory Bird Plans
- Upland Game Plans
- Waterfowl Plans
- Recreation and Management
- Scenic System

V. Annual HMP Program Report

VI. Coordination

VI. Economic Analysis

- Cost Benefit Analysis
- Project Priorities
- Funding Needs

VII. Appendices

VIII. Environmental Assessment

IX. Decision Record

APPENDIX 2.H

HABITAT MANAGEMENT PLAN CONTENTS

Introduction	1.0	Introduction	1.0
1.0 Purpose and Objectives	1.1	1.0 Purpose and Objectives	1.1
2.0 Background	2.1	2.0 Background	2.1
3.0 Site Description	3.1	3.0 Site Description	3.1
4.0 Resource Inventory	4.1	4.0 Resource Inventory	4.1
5.0 Assessment	5.1	5.0 Assessment	5.1
6.0 Management Plan	6.1	6.0 Management Plan	6.1
7.0 Implementation	7.1	7.0 Implementation	7.1
8.0 Monitoring and Evaluation	8.1	8.0 Monitoring and Evaluation	8.1
9.0 Appendix	9.1	9.0 Appendix	9.1
10.0 References	10.1	10.0 References	10.1
11.0 Glossary	11.1	11.0 Glossary	11.1
12.0 Maps	12.1	12.0 Maps	12.1
13.0 Photographs	13.1	13.0 Photographs	13.1
14.0 Data Tables	14.1	14.0 Data Tables	14.1
15.0 Other Documents	15.1	15.0 Other Documents	15.1
16.0 Summary	16.1	16.0 Summary	16.1
17.0 Conclusions	17.1	17.0 Conclusions	17.1
18.0 Recommendations	18.1	18.0 Recommendations	18.1
19.0 Acknowledgements	19.1	19.0 Acknowledgements	19.1
20.0 Contact Information	20.1	20.0 Contact Information	20.1

Habitat Management Plan Contents

The following is a list of the typical contents of a wildlife habitat management plan (HMP).

- I. Introduction
 - Purpose of the Plan
 - Reason for Revision
 - Accomplishments of Previous HMP for this area
 - Policies and Practices in Wildlife Management
 - Relationship of this HMP with the Resource Management Plan
 - Cultural Resource Management
 - Wilderness Management
 - Fire
 - Rangeland Management
 - Minerals
- II. Ecosystem Description
 - Physical Profile
 - Biological Profile
 - Vegetative Communities
 - Wildlife Species
 - Ecological Relationships
- III. Land Status Administration
- IV. Management Goals, Objectives, and Actions
 - Wildlife Water Developments
 - Vegetation Management
 - Special Status Species
 - Big Game Species
 - Migratory Bird Species
 - Upland Game Birds
 - Waterfowl and Shorebirds
 - Predators and Carnivores
 - Nongame Species
- V. Annual HMP Progress Report
- VI. Coordination
- VI. Economic Analysis
 - Cost Benefit Analysis
 - Project Priorities
 - Funding Needs
- VII. Appendices
- VIII. Environmental Assessment
- IX. Decision Record

Habitat Management Plan Contents

The following is a list of the typical contents of a habitat management plan (HMP):

- I. Introduction
 - 1. Purpose of the Plan
 - 2. Reason for Revision
 - 3. Administrative of Previous HMP for the Area
 - 4. Historical Pattern of Wildlife Management
 - 5. Relationship of the HMP with the Habitat Management Plan
 - 6. Critical Resource Assessment

APPENDIX 2.1

ARIZONA STRIP FIELD OFFICE OIL AND GAS LEASE STIPULATIONS

- II. Background
 - 1. Planning
 - 2. Biology
 - 3. Vegetative Communities
 - 4. Wildlife Species
 - 5. Historical Relationships
- III. Land Status Administration
- IV. Management Goals, Objectives and Methods
 - 1. Goals
 - 2. Objectives
 - 3. Methods
 - 4. Monitoring and Evaluation
 - 5. Production and Reporting
 - 6. Resource Protection
- V. Annual HMP Progress Report
- VI. Coordination
- VII. Economic Analysis
 - 1. Cost Benefit Analysis
 - 2. Project Financing
 - 3. Funding Needs
- VIII. Environmental Assessment
- IX. Decision Record

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
<p>CONTROLLED SURFACE USE STIPULATIONS CRITICAL SOILS, MUNICIPAL WATERSHEDS, FLOODPLAINS, FISH & WILDLIFE, VISUAL AND CULTURAL RESOURCES, HISTORIC AND RECREATION TRAILS</p>	
<p>Surface occupancy or use is subject to the following special operating constraints.</p>	
<p>On the lands described below:</p>	
<p>For the purpose of: Preserving and protecting critical soils, floodplains, municipal watershed, fish and wildlife, visual resources, cultural resources, and historic and recreation trail corridors from adverse impacts as described in the Resource Management Plan and EIS. Waivers, exceptions, or modifications to this limitation may be specifically approved in writing by the authorized officer of the Bureau of Land Management if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of these stipulations, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)</p>	
<p>ASFO 1</p>	<p>CRITICAL SOILS: The area has critical soil erosion conditions. New roads will be constructed to avoid critical soils where possible. New roads will be constructed with water bars. Riprap may be required. Road grades in excess of 10 percent will not normally be allowed. In special circumstances, where a road grade of more than 10 percent is allowed, its maximum length will be 1,000 feet. Access grading, exploration, drilling or other activities will be prohibited during wet or muddy periods. Cross-country travel will be allowed only when soils are dry or frozen. BLM will determine what is wet, muddy, or frozen. The limitation does not apply to maintenance and operation of existing wells.</p> <p>Construction and development are to be avoided on slopes in excess of 6 percent. Operations will be located to reduce erosion and improve the opportunity for revegetation within critical soils areas. Reclamation on sites with critical soils will require grading using slopes of 5 percent or less where possible and grading the site so as to collect water for revegetation on-site.</p>
<p>ASFO 2</p>	<p>SENSITIVE WATERSHEDS: In order to minimize watershed damage, exploration, drilling, and other development activity in the ___ will be allowed only during the period from April 30 to November 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the Bureau of Land Management.</p> <p>The lessee is informed that the floodplain portions of the lease area require special attention to prevent damage to surface resources and contamination to the ___ watersheds. Any surface use within such areas will be strictly controlled or restricted where not essential for operations. Appropriate modifications to imposed restrictions will be made for maintenance and operations of producing oil and gas wells.</p> <p>Construction of access roads and drill pads on slopes in excess of 30 percent will require special design standards to minimize watershed damage in the ___. Drilling operations and any associated construction activities on slopes in excess of 50 percent may require directional drilling to prevent damage to the watershed. Exceptions to these limitations may be specifically approved in writing by the authorized officer of the Bureau of Land Management.</p>
<p>ASFO 3</p>	<p>WATERSHED SLOPE RESTRICTIONS: No surface occupancy or other surface disturbance in the ___ will be allowed on slopes in excess of 30 percent without written permission from the authorized officer of the Bureau of Land Management.</p>

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 4	<p>FLOODPLAIN OCCUPANCY: No occupancy or other surface disturbance will be allowed within 330 feet of the centerline or within the 100-year recurrence interval floodplain, whichever is greater, of the perennial streams, or within 660 feet of springs, whether flowing or not, located in the _____. This distance may be modified when specifically approved in writing by the authorized officer of the Bureau of Land Management.</p> <p>In order to minimize watershed damage, exploration, and drilling and other development activity in the _____ will be allowed only during the period from April 30 to November 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the Bureau of Land Management.</p> <p>Construction of access roads and drill pads on slopes in excess of 30 percent will require special design standards to minimize watershed damage in the _____. Drilling operations and any associated construction activities on slopes in excess of 50 percent may require directional drilling to prevent damage to the watershed. Exceptions to the limitations may be specifically approved in writing by the authorized officer of the Bureau of Land Management.</p>
ASFO 5	<p>RIPARIAN SPRINGS: No occupancy or other surface disturbance will be allowed within 0.25 miles of springs, whether flowing or not, as described in _____. This distance may be modified when specifically approved in writing by the authorized officer of the Bureau of Land Management.</p> <p>In order to minimize watershed damage, exploration, and drilling and other development activity at these springs will be allowed only during the period from April 30 to November 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the Bureau of Land Management.</p> <p>Construction of access roads and drill pads on slopes in excess of 30 percent will require special design standards to minimize watershed damage in the _____. Drilling operations and any associated construction activities on slopes in excess of 50 percent will not be allowed. Exceptions to the limitations may be specifically approved in writing by the authorized officer of the Bureau of Land Management.</p>
ASFO 6	<p>RIPARIAN WETLAND HABITAT: In order to protect riparian/wetland habitat and municipal and non-municipal watershed areas, no occupancy or other surface disturbance will be allowed within 1,200 feet of live water or within 1,200 feet of wetlands as defined by the United States Fish and Wildlife Service in "Classification of Wetlands and Deep Water Habitats of the United States," 1979, page 3 located in the _____. This limitation does not apply to maintenance and operation of producing wells. If the lessee can demonstrate that operations can take place without impact to the resource being protected, an exemption to this stipulation may be granted if approved in writing by the authorized officer in consultation with the District's watershed specialist. For example, exemptions may be allowed where the riparian zone or the hydrologic influence area of phreatophytes exists less than 1,200 feet from live water.</p>
ASFO 7	<p>FISHERIES / LIVE WATER RESTRICTIONS: In order to prevent fisheries degradation and water pollution, no drilling will be allowed within 1,200 feet of live water or the reservoirs located in the Virgin or Paria River drainages or Kanab Creek. This distance may be modified when specifically approved in writing by the authorized officer of the Bureau of Land Management.</p>
ASFO 8	<p>LIVE WATER RESTRICTIONS No occupancy will be allowed within 1,200 feet of live water _____. This distance may be modified when specifically approved in writing by the authorized officer of the Bureau of Land Management.</p>

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 9	<p>SPECIAL STATUS SPECIES HABITAT AREA: Exploration, drilling, and/or other development activity within a special status species ACEC or WHA/VHA may be restricted seasonally to a period when the species is not active. These limitations do not apply to maintenance and operation of producing wells.</p> <p>The authorized officer may grant exception on a case-by-case basis if it can be shown that:</p> <ol style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The species are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the species. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.</p>
ASFO 10	<p>SPECIAL STATUS SPECIES HABITAT SURVEYS: Special status species habitat surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within an area of known or suspected occupancy by special status species. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.</p>
ASFO 11	<p>DESERT TORTOISE HABITAT AREAS: Desert tortoise ACECs would remain open to leasing subject to seasonal restrictions and subject to a waivable no surface occupancy stipulation (WNSO). Surface disturbing activity would be limited to the period from October 15 to March 15 under a seasonal restriction. Surface occupancy could be allowed by a BLM authorized officer after consultation with USFWS on the authorization.</p> <p>The authorized officer may waive this stipulation on a case by case basis if it can be shown that:</p> <ol style="list-style-type: none"> (1) Desert tortoise are not present in a specific project location, (2) All operations and activities conducted in association with the action take place during the inactive season for desert tortoise (October 15 – March 15), (3) The activity can be conducted in a manner that has no affect on desert tortoise or their critical habitat, (4) The U.S. Fish and Wildlife Service concurs with BLM’s determination that the proposed activity would not likely adversely affect desert tortoise or modify their habitat, or; (5) Following consultation with the U.S. Fish and Wildlife Service, an incidental take statement is provided which would allow the project to proceed. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.</p>
ASFO 12	<p>DESERT TORTOISE SURVEYS: Desert tortoise surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within an area known or suspected to be occupied by desert tortoise. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.</p>

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 13	<p>CRUCIAL MULE DEER SUMMER HABITAT: Closed to surface use during the crucial summer use period, May 15 through June 30. This seasonal condition would not affect maintenance, and operation activities for production.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Off-site mitigation may be required when unreclaimed disturbance caused by activity totals more than ten acres in two years. The off-site mitigation must be within the known habitat, but not necessarily within the crucial habitat area. Off-site mitigation will include seeding or planting vegetation favorable to deer. Revegetation must be established within five years after project completion. Revegetation must be with species palatable to deer and will be deemed successful when seedlings are established and tending towards the density that existed before the surface was disturbed.</p>
ASFO 14	<p>CRUCIAL DEER WINTER RANGE: Closed to surface use during the crucial winter use, December 15 to April 30. This seasonal condition would not affect maintenance and operation activities for production.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Off-site mitigation may be required when unreclaimed disturbance caused by activity totals more than ten acres in two years. The off-site mitigation must be within the known habitat, but not necessarily within the crucial habitat area. Off-site mitigation will include seeding or planting vegetation favorable to deer. Revegetation must be established within five years after project completion. Revegetation must be with species palatable to deer and will be deemed successful when seedlings are established and tending towards the density that existed before the surface was disturbed.</p>
ASFO 15	<p>CRUCIAL BIGHORN SHEEP HABITAT: Closed to surface use during bighorn sheep lambing (April 1 to July 15) and during the rutting period (October 15 to December 31). These seasonal conditions would not affect maintenance and operation activities for production.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Off-site mitigation may be required when unreclaimed disturbance caused by activity totals more than ten acres in two years. The off-site mitigation must be within the known habitat, but not necessarily within the crucial habitat area. Off-site mitigation will include seeding or planting vegetation favorable to bighorn sheep. Revegetation must be established within five years after project completion.</p>

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 16	<p>BIGHORN SHEEP LAMBING AREAS: In order to protect bighorn sheep lambing habitat, exploration, drilling, and other development activity will be allowed only during the period from July 1 to March 15. This limitation does not apply to maintenance and operation of producing wells.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department.</p>
ASFO 17	<p>PRONGHORN ANTELOPE HABITAT: Antelope Habitat will be closed during the fawning season (May 15 to June 15). This seasonal condition would not affect maintenance and operation activities for production.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Off-site mitigation may be required when unreclaimed disturbance totals more than ten acres in two years in crucial habitat. The off-site mitigation must be within the known habitat area but not necessarily within crucial habitat. Off-site mitigation could include seeding and planting favorable to antelope, or water could be developed to allow animals to use other parts of the habitat area.</p>
ASFO 18	<p>PRONGHORN ANTELOPE FAWNING AREAS: In order to protect antelope fawning areas, exploration, drilling and other development activity in the ___ will be allowed only from July 1 to March 15. This limitation does not apply to maintenance and operation of producing wells.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department. Such a determination may result if fawning is completed early and the fawning area is abandoned earlier to allow for disturbing activities for fluid mineral leasing and exploration to start earlier than July 1.</p>
ASFO 19	<p>CALIFORNIA CONDOR NESTING SITES: Exploration, drilling, and/or other development activity within 0.5 mile radius of active condor nesting areas would be allowed only from July 1 to March 1 in order to protect these nests. No roost trees will be cut. These limitations do not apply to maintenance and operation of producing wells.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The birds are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the birds. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the condors present to allow for disturbing activities for fluid mineral leasing and exploration.</p>

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 20	<p>BALD EAGLE ROOST SITES: Exploration, drilling, and/or other development activity within 0.5 mile radius of active or historic bald eagle roost sites will be allowed only from March 15 to November 1 in order to protect these roosts. No roost trees will be cut. These limitations do not apply to maintenance and operation of producing wells.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) Bald eagles are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the eagles. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the roost site no longer exists or other roost sites are found to have taken over in importance to the bald eagles present to allow for disturbing activities for fluid mineral leasing and exploration.</p>
ASFO 21	<p>GOLDEN EAGLE NEST SITES: No surface occupancy or use is allowed (does not apply to casual use) within 1/2 mile of golden eagle nests which have been active within the past two years. This restriction would not apply to maintenance and operation of existing programs and facilities.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) Golden eagles are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the eagles. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the eagles present to allow for disturbing activities for fluid mineral leasing and exploration.</p>
ASFO 22	<p>FERRUGINOUS HAWK NEST SITES: No surface occupancy or use is allowed (does not apply to casual use) within 1/2 mile of known ferruginous hawk nests, unless it could be shown to the satisfaction of the authorized officer that the nest has not been active within the past 2 years. This restriction would not apply to maintenance and operation of existing programs and facilities.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The birds are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the birds. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the hawks present to allow for disturbing activities for fluid mineral leasing and exploration.</p>
ASFO 23	<p>PEREGRINE FALCON NEST SITES: No surface occupancy or use is allowed (does not apply to casual use) within 1 mile of known peregrine falcon nests. This restriction would not apply to maintenance and operation of existing programs and facilities.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) Peregrine falcons are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the falcons present to allow for disturbing activities for fluid mineral leasing and exploration.</p>

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 24	<p>RAPTOR NESTING SITES: Exploration, drilling, and/or other development activity within 0.5 mile radius of active or historic raptor nesting areas would be allowed only from July 1 to March 1 in order to protect these roosts. No roost trees will be cut. These limitations do not apply to maintenance and operation of producing wells.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The birds are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the birds. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. Such a determination may result if the nest site no longer exists or other nest sites are found to have taken over in importance to the raptors present to allow for disturbing activities for fluid mineral leasing and exploration.</p>
ASFO 25	<p>RAPTOR HABITAT SURVEYS: Raptor surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within a known nesting complex for raptors. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.</p>
ASFO 26	<p>BURROWING OWL RELEASE SITE No occupancy or other surface disturbance will be allowed within 0.5 mile radius of active or historic burrowing owl nesting burrows. This restriction would not apply to maintenance and operation of existing programs and facilities.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The animals are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the animals. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.</p>
ASFO 27	<p>CRUCIAL WATERFOWL HABITAT: In order to protect crucial waterfowl habitat, exploration, drilling, and other development activity in the ___ will be allowed only during the period from July 15 to March 15. This restriction would not apply to maintenance and operation of existing programs and facilities.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) Waterfowl are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect waterfowl. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.</p>

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 28	<p>MIGRATORY BIRD HABITAT: In order to protect migratory habitat, exploration, drilling, and other development activity in the ___ will be allowed only during the period from July 15 to March 15. This restriction would not apply to maintenance and operation of existing programs and facilities.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) Migratory birds are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect migratory birds. <p>This determination would be made by a BLM wildlife biologist in coordination with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.</p>
ASFO 29	<p>MIGRATORY BIRD HABITAT SURVEYS: Migratory bird habitat surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within one mile of live water known or suspected to be used by migratory birds. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.</p>
ASFO 30	<p>SPECIAL STATUS PLANT SPECIES</p> <p>No surface occupancy or use is allowed on the lands containing special status plant species habitat (federally listed species only). This restriction would not apply to maintenance and operation of existing programs and facilities.</p> <p>The authorized officer may grant exception on a case by case basis if it can be shown that:</p> <ul style="list-style-type: none"> (1) Legal rights would be curtailed; (2) The plants are not present in a specific project location, or; (3) The activity can be conducted so as not to adversely affect the plants.
ASFO 31	<p>SPECIAL STATUS PLANT SURVEYS: Special status plant surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within an area known or suspected to be habitat for special status plant species. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management at the time of year when detection of the species is most likely to occur. If protocols have been established for surveys of the species, these protocols will be used. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the authorized officer prior to the field survey being conducted. Based on the result of the field survey, the authorized officer will determine appropriate buffer zones.</p>
ASFO 32	<p>VRM CLASS II AREAS: In order to retain important scenic values in a visual resource management class II area, all changes to landforms or vegetation caused by oil and gas exploration shall be done very subtly. Proposed changes may be seen, but should not attract attention, as observed from key observation points or corridors. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the surface management agency if it is shown to the satisfaction of the officer that the proposed disturbance or occupancy will not impair the visual resources of the area.</p>
ASFO 33	<p>VISUAL RESOURCE MANAGEMENT (VRM) CLASS II and III: These areas have moderate to high quality visual resources. The objectives of these classes are to retain the existing character of the landscape in Class II and to partially retain the existing character of the landscape in Class III. Exploration, drilling and other development or production activities must meet the objectives of VRM Class II and III.</p>

Stipulation Number	Arizona Strip Field Office Oil and Gas Lease Stipulations
ASFO 34	<p>HISTORIC AND RECREATION TRAIL CORRIDORS: In order to reduce conflicts with recreation opportunities along historic and recreation trail corridors on the Arizona Strip, measures may be required of the lessee/operator by the surface management agency to reduce potential visual (including night sky conditions), audible, and recreation setting impacts associated with surface disturbing activities and construction of above ground structures. Exceptions to these measures may be specifically authorized through a permit issued by the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed operations and occupancy will not adversely impact recreation opportunities in the vicinity of these trails.</p>
ASFO 35	<p>CULTURAL RESOURCES: Cultural properties eligible for or listed on the National Register of Historic Places must be avoided by a sufficient distance to allow permanent protection. If avoidance is not possible, appropriate mitigation would apply, ranging from limited testing or detailed recording to extensive excavation. Any mitigation would be tailored to fit the specific circumstances and may be reviewed by the Arizona State Historic Preservation Officer and the Advisory Council on Historic Preservation.</p> <p>Cultural surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management. Surveys will conform to the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation, including the Professional Qualifications Standards, and with BLM and AZ SHPO requirements and protocols. Cultural surveys must also be performed under a current Arizona BLM Cultural Resource Use Permit. Based on the results of the field survey, the authorized officer will determine appropriate mitigation.</p>
ASFO 36	<p>LEASE STIPULATION - CULTURAL RESOURCES ACEC</p> <p>In order to protect cultural resources in the _____ ACEC a waivable no surface occupancy (WNSO) stipulation would apply. Surface occupancy could be allowed when specifically approved in writing by the authorized officer. The authorized officer may waive this stipulation on a case-by-case basis if it can be shown that:</p> <ol style="list-style-type: none"> (1) Legal rights would be curtailed; (2) Cultural properties listed on or eligible for the National Register of Historic Places are not present in a specific project location, or; (3) The activity can be mitigated, appropriate mitigation would range from limited testing or detailed recording to extensive excavation. Any mitigation will be tailored to fit the specific circumstances and would be reviewed by the Arizona State Historic Preservation Officer and potentially by the Advisory Council on Historic Preservation. <p>Cultural surveys will be required whenever surface disturbances and/or occupancy proposed in association with oil/gas exploration occur within an ACEC. Field surveys will be conducted by the lessee/operator as determined by the authorized officer of the Bureau of Land Management. Surveys will conform to the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation, including the Professional Qualifications Standards, and with BLM and AZ SHPO requirements and protocols. Cultural surveys must also be performed under a current Arizona BLM Cultural Resource Use Permit. Based on the results of the field survey, the authorized officer will determine appropriate mitigation.</p>

APPENDIX 2.J

CULTURAL RESOURCE USE ALLOCATIONS

CULTURAL RESOURCES USE ALLOCATIONS

Cultural Resources, as directed in BLM Manual 8110, are allocated to appropriate use categories and managed in a manner to ensure, protect, or contribute to their assigned use. Use categories provide direction on which sites need to be protected and when or how use should be authorized. Cultural resources can be allocated to the various recognized use categories even before they are individually identified. Classes or types of sites, as well as specific sites, are allocated to one or more use categories during the planning process.

All BLM cultural properties in the Planning Area, whether already recorded or projected to occur will be allocated to the uses listed below, according to their nature and relative preservation value. These allocations pertain to cultural resources, not to areas of land.

Scientific Use applies to archaeological sites suitable for scientific or historic study, using currently available research techniques. Studies may employ non-intrusive methods, such as mapping or photo documentation, or other methods, such as collection or excavation, that result in the property's physical alteration or destruction. Properties allocated to this category must be preserved until their research potential is realized. Research projects, including data recovery, must be approved by the BLM. The majority of the cultural properties in a given geographic area will be allocated to the category of scientific use. Scientific use may be compatible with other use categories when studies involve limited alteration of a property.

Conservation for Future Use category is reserved for exceptionally rare or important cultural properties suitable for long-term preservation. Management objectives emphasize protection of a site's present condition and setting, as well as its preservation, until specified provisions are met in the future. The BLM will restrict activities, including cultural resource uses that threaten the condition of a site allocated to this category. However, this use category may be compatible with other uses, such as traditional use or public use, for which long-term preservation is desirable.

Traditional Use is applied to a property known to be perceived by a specified social and/or cultural group as important in maintaining the cultural identity or heritage of the group. Cultural properties assigned to this category are to be managed in ways that recognize the importance ascribed to them and seek to accommodate their continuing traditional use. Long-term preservation is desirable, with use limitations or protective measures developed through consultations with the appropriate tribes or cultural groups.

Public Use may be applied to a property appropriate as an interpretive exhibit in place or for related educational or recreational uses by the general public. Long-term preservation is desirable, in conjunction with on-site interpretation and/or public visitation. Management actions at specific sites will involve the determination of permitted uses, use limitations, protective measures, and design requirements.

Experimental Use may be applied to a property judged suitable for controlled experimental study that would result in the property’s alteration, possibly including loss of integrity and destruction of physical elements. Experimental study should aim toward practical management objectives, such as understanding the kinds and rates of natural or human-caused deterioration, testing the effectiveness of protection measures, or developing new research or interpretive methods. Experimental use should not be applied to properties with strong research potential, traditional cultural importance, or good public use potential, if it would significantly diminish those uses.

Discharged from Management is assigned to properties that have no remaining identifiable use, in reference to the categories described above. Most often these are archaeological sites, such as small surface scatters of artifacts or debris, whose limited research potential is effectively exhausted as soon as they have been documented. This category may also apply to more complex properties that have had their significant information collected and preserved through scientific data recovery to mitigate the impacts of a proposed action. Also, properties destroyed by natural events or human activities may be assigned to this category. Properties discharged from management are removed from further management attention and do not constrain other land uses. Specific cultural properties must be inspected in the field and recorded before they can be discharged from management.

The following desired outcomes and management actions apply to cultural properties allocated to specific cultural resource uses.

Table 1. Cultural Resource use allocations and desired outcomes:

Use Allocation ¹	Desired Outcomes
a. Scientific Use	Preserved until research potential is realized
b. Conservation for Future Use	Preserved until conditions for use are met
c. Traditional Use	Long-term preservation
d. Public Use	Long-term preservation, on-site interpretation
e. Experimental Use	Protected until used
f. Discharged from Management	No use after recording; not preserved

¹ The majority of cultural properties in a given geographic area will fall into categories a and f. The less common properties in categories b through e are likely to be associated with particular settings that can be delineated geographically in the planning process. As the plan is developed, properties in categories b-d will require the most attention to balance their proactive uses with other land and resource uses.

Table 2. Cultural Resource use allocations and management actions:

Use Allocation	Management Action
Scientific Use	Permit appropriate research, including data recovery
Conservation for Future Use	Propose protective measures/designations
Traditional Use	Consult with tribes; determine limitations
Public Use	Determine permitted use ¹
Experimental Use	Determine nature of experiment
Discharged from Management	Remove protective measures

¹ Safeguards against incompatible land and resource uses may be imposed through withdrawals, stipulations on leases and permits, design requirements, and similar measures which are developed and recommended by an appropriately staffed interdisciplinary team.

Table 3. Types of Cultural Properties in the Planning Area and potential Use Allocations

Cultural Property Type	Potential Use Allocation
Habitation; village, town, pueblo, cabin, storage cists, trash middens,	A, B, C, D, E
Caves and Rock Shelters	A, B, C, D, E
Rock Art, historic inscriptions	A, B, C, D, E, F
Agricultural; terraces, water control features, ranching facilities	A, B, C, D, E, F
Resource Use; mines, artifact scatters, roasting pits, quarries, corrals, fences	A, B, C, D, E, F
Roads and trails	B, C, D, F
Sacred sites, cemeteries, graves	B, C

Use Allocations; A=Scientific Use, B=Conservation for Future Use, C=Traditional Use, D=Public Use, E=Experimental Use, F=Discharge from Management

APPENDIX 2.K

ACEC SUMMARY TABLE: VALUES, RELEVANCE, AND IMPORTANCE CRITERIA

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	VALUES	RELEVANCE AND IMPORTANCE
Beaver Dam Slope ACEC (Alts A,B,C,D,E) 51,197 acres in Alt. E	Desert Tortoise Mojave Desert	Habitat essential for maintaining species diversity and critical habitat for threatened desert tortoise, of national worth and distinctiveness. Desert tortoise are fragile resources, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation.
Black Knolls ACEC (Alts B,C,E) 80 acres in Alt E	Holmgren Milkvetch	Habitat essential for rare, endemic endangered plant species of national worth and distinctiveness. The Holmgren Milkvetch and its community is fragile, sensitive, rare, irreplaceable, unique, endangered, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
Buckskin ACEC (Alt B) 160 acres in Alt B	Cliff Milkvetch	Habitat essential for the rare, irreplaceable, unique, and sensitive Cliff milkvetch. The Cliff milkvetch has national worth and distinctiveness and is vulnerable to adverse change. The direct threat is from vehicle and OHV use.
Clayhole ACEC (Alt B) 7,362 acres in Alt B	Fick pincushion cactus	Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
Coyote Valley ACEC (Alt B) 776 acres in Alt B	Paradine Pincushion Cactus	Habitat essential for endangered plant Paradine pincushion cactus
Fort Pearce ACEC (Alts A,B,C,E) 5,498 acres in Alt E	Critical Watershed Siler Pincushion Cactus	Critical watershed of regional importance for St. George, Utah area. Habitat essential for rare, endemic threatened plant species of national worth and distinctiveness. The Siler Pincushion Cactus and its community is fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
Grey Points ACEC (Alt B) 12,881 acres in Alt B	Desert Bighorn Sheep Gierisch Globe Mallow Scenic Wilderness Characteristics	Wildlife resource including a population of desert bighorn sheep and habitat essential for maintaining species diversity. Desert bighorn sheep are a unique wildlife resource and are vulnerable to change. Threats include OHV, disease, domestic livestock, and predation. Habitat essential for rare, sensitive plant species of national worth and distinctiveness. The Gierisch globe mallow and its community is fragile, sensitive, rare, irreplaceable, unique, and vulnerable to adverse change. The direct threat is destruction from OHV use.

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	VALUES	RELEVANCE AND IMPORTANCE
		<p>Significant scenic values at the eastern entrance to the Virgin River Gorge.</p> <p>Significant lands of regional and national importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.</p>
<p>Hurricane Cliffs ACEC (Alt B) 23,464 acres in Alt B</p>	<p>Bighorn Sheep Riparian Wilderness characteristics</p>	<p>Essential habitat for maintaining species diversity of desert bighorn sheep, with regional worth and distinctiveness. Threats include loss of habitat, harassment by OHV, disease threat from domestic livestock, and predation.</p> <p>The riparian areas are natural systems that include rare, endemic plant communities and have regional significance. It is fragile, irreplaceable, and unique and is vulnerable to adverse change. Threats include dewatering, loss of habitat due to development, flooding, and alteration of stream channel.</p> <p>Significant lands of regional and national importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.</p>
<p>Johnson Spring ACEC (Alts A,B,C,E) 2,058 acres in Alt E</p>	<p>Cultural Scenic Siler Pincushion Cactus</p>	<p>Significant regionally important cultural resources vulnerable to vandalism and impacts.</p> <p>Significant national and regional scenic values visible from Highway 89 and 89A, the Shinarump Cliffs provide a natural scenic area.</p> <p>Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from OHV use.</p>
<p>Kanab Creek ACEC (Alts B,C,E) 13,146 acres in Alt. E</p>	<p>Cultural Endangered Bird Riparian Scenic Wilderness characteristics</p>	<p>Significant regionally important cultural resources vulnerable to vandalism and impacts.</p> <p>The riparian area is a natural system that includes rare, endemic plant communities and suitable unoccupied habitat for endangered SW willow flycatcher. It has regional significance. The riparian area is fragile, irreplaceable, and unique and is vulnerable to adverse change. Cause for concern is dewatering, loss of habitat due to development, flooding, and alteration of the stream channel.</p> <p>Significant lands of regional importance containing wilderness characteristics with a high degree of naturalness,</p>

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	VALUES	RELEVANCE AND IMPORTANCE
		outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.
Lime Kiln/Hatchet Canyon ACEC (Alt B) 11,731 acres in Alt B	Desert Bighorn Sheep Scenic Wilderness characteristics	Wildlife resource including a population of desert bighorn sheep and habitat essential for maintaining species diversity. Desert bighorn sheep are a unique wildlife resource and are vulnerable to change. Threats include harassment by OHV, disease threat from domestic livestock, and predation. Significant regional scenic values in Lime Kiln Canyon and at the crest of the Virgin Mountains overlooking Mesquite, Nevada to the north and Grand Canyon-Parashant National Monument to the south. Significant lands of regional importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.
Little Black Mountain ACEC (Alts A,B,C,D,E) 241 acres in all Alts	Cultural	Significant regionally important cultural resources vulnerable to vandalism and impacts; rare and significant interpretive site.
Lone Butte ACEC (Alts B, C, E) 1,900 acres in Alt E	Cultural Jones Cyclad Scenic	Essential habitat for threatened Jone's cyclad and associated communities; a rare, endemic terrestrial plant. This area exhibits natural processes and systems and has national worth and distinctiveness. Jone's cyclad is irreplaceable, unique, threatened, and vulnerable to adverse change. Threats include limited distribution and potential for destruction by vehicle and OHV use. Significant regionally important cultural resources vulnerable to vandalism and impacts. Significant national and regional scenic values of this portion of the Vermilion Cliffs along Highway 389.
Lost Spring Mountain ACEC (Alts A,B,C,E) 17,744 acres in Alt E	Cultural Siler Pincushion Cactus Wilderness characteristics	Significant regionally important cultural resources vulnerable to vandalism, OHV damage, and impacts. Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use. Significant lands of regional and national importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.

ACEC Summary Table: Values, Relevance, and Importance Criteria		
ACEC NAME (Alternative)	VALUES	RELEVANCE AND IMPORTANCE
<p>Marble Canyon ACEC (Alts A,B,C,D,E) 9,852 acres in Alt E</p>	<p>Brady Pincushion Cactus Cultural Raptors Scenic</p>	<p>Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from OHV use.</p> <p>Raptors, particularly the California condor, are known to frequent the ACEC during cooler months of the year. Threats include lead poisoning and human interference.</p> <p>Significant regional important cultural resources vulnerable to vandalism, OHV damage, and impacts in Alt B.</p> <p>Significant national and regional scenic values on the rim of the Colorado River at Marble Canyon.</p>
<p>Moonshine Ridge ACEC (Alts A,B,C,E) 9,231 acres in Alt E</p>	<p>Cultural Scenic Siler Pincushion Cactus</p>	<p>Significant regionally important cultural resources vulnerable to vandalism, OHV damage, and impacts.</p> <p>Significant regional scenic values of the Shinarump cap on Yellowstone Mesa, visible from Highway 389.</p> <p>Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.</p>
<p>Nampaweap ACEC (Alt A) 535 acres</p>	<p>Cultural</p>	<p>Significant regionally important cultural resources vulnerable to vandalism, OHV damage, and impacts.</p>
<p>Pakoon ACEC (Alt A) DWMA (Alts B, C, D, E) 76,014 acres</p>	<p>Desert Tortoise</p>	<p>Habitat essential for maintaining species diversity and critical habitat for threatened desert tortoise, of national worth and distinctiveness. Desert tortoise are fragile resources, rare, irreplaceable, unique, threatened, and vulnerable to adverse change.</p> <p>Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation.</p>
<p>Shinarump ACEC (Alts B,E) 3,619 acres in Alt E</p>	<p>Cultural Scenic Siler Pincushion Cactus</p>	<p>Significant regionally important cultural resources vulnerable to vandalism, vehicle and OHV damage, and impacts</p> <p>Significant regional scenic values of this portion of the Shinarump cap on mesa tops east of Fredonia visible from Highway 89.</p>

ACEC Summary Table: Values, Relevance, and Importance Criteria

ACEC NAME (Alternative)	VALUES	RELEVANCE AND IMPORTANCE
		Habitat essential for rare, endemic threatened plant species and their communities of national worth and distinctiveness. The pincushion cacti and their communities are fragile, sensitive, rare, irreplaceable, unique, threatened, and vulnerable to adverse change. The direct threat is destruction from vehicle and OHV use.
<p>Twist Hills ACEC (2 locations) (Alt B) 1,255 acres in Alt B</p>	Fick Pincushion Cactus	Habitat essential for rare, endemic, terrestrial candidate species of national worth and distinctiveness. The Fick Cactus and its community is fragile, sensitive, rare, irreplaceable, unique, and vulnerable to adverse change. The direct threat is destruction from OHV use.
<p>Virgin River Corridor ACEC (Alts A,B,C,D,E) 2,063 acres in Alt E</p>	Cultural Endangered Fish Riparian Scenic	<p>Significant regionally important cultural resources vulnerable to vandalism, and vehicle and OHV damage.</p> <p>Essential habitat critical to the survival and recovery of the wildlife species including populations of endangered woundfin minnow and endangered Virgin River chub. Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation.</p> <p>The riparian area is a natural system that includes rare, endemic plant communities and has regional significance. The riparian area is fragile, irreplaceable, and unique and is vulnerable to adverse change. Threats include dewatering, loss of habitat due to development, flooding, and alteration of stream channel.</p> <p>Significant national and regional scenic values in the Virgin River Gorge.</p>
<p>Virgin Slope ACEC (Alts A,B,C,D,E) 40,206 acres in Alt. E</p>	Desert Tortoise Wilderness characteristics	<p>Habitat essential for maintaining species diversity and critical habitat for threatened desert tortoise, of national worth and distinctiveness. Desert tortoise are a fragile resource, rare, irreplaceable, unique, threatened, and vulnerable to adverse change.</p> <p>Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation.</p> <p>Significant lands of regional and national importance containing wilderness characteristics with a high degree of naturalness, outstanding opportunities for solitude, and opportunities for primitive and unconfined recreation.</p>
<p>Witch Pool ACEC (Alt A) 279 acres</p>	Cultural	Significant regionally important cultural resources vulnerable to vandalism, OHV damage, and impacts.

APPENDIX 2.L

VISUAL RESOURCE MANAGEMENT CLASSES AND CRITERIA FOR CLASSES

Class	Description	Criteria
Class 1
Class 2
Class 3
Class 4
Class 5
Class 6
Class 7
Class 8
Class 9
Class 10
Class 11
Class 12
Class 13
Class 14
Class 15
Class 16
Class 17
Class 18
Class 19
Class 20
Class 21
Class 22
Class 23
Class 24
Class 25
Class 26
Class 27
Class 28
Class 29
Class 30
Class 31
Class 32
Class 33
Class 34
Class 35
Class 36
Class 37
Class 38
Class 39
Class 40
Class 41
Class 42
Class 43
Class 44
Class 45
Class 46
Class 47
Class 48
Class 49
Class 50

Visual Resource Management Classes and Criteria for Classes

A. Introduction

Visual resource values are managed in accordance with visual resource management (VRM) class objectives (standards and guidelines). Following the update of the existing visual resource inventory for the planning effort to incorporate identified National Monument scenic values and higher public sensitivity to those values, VRM classes were designated for all areas of BLM land under all alternatives and for NPS lands under Alternatives B through E. The inventory served as the basis for considering and developing VRM allocations and management for other land uses was fully considered.

By design and policy, VRM management classes may differ from VRM inventory classes, based on management priorities for land uses. Once allocated and following the completion of the land use plan and the signing of the Record of Decision for the EIS, other resource uses and management activities would be managed to be consistent with the VRM objectives established in the land use plan. Visual resource design techniques and best management practices would be used to mitigate the potential for short- and long-term visual impacts from such uses and activities.

Contrast ratings would be required for all major projects proposed on public lands that fall within VRM Class I, II, and III areas which have high sensitivity levels. By using contrast ratings as a design tool to assist management, rather than as a means to preclude development, potential visual impacts to visual resources would be minimized. And it is the VRM class objectives (standards and guidelines) against which a contrast rating effort measures the potential for unacceptable change to landscape conditions.

In applying the VRM Class objectives in the various RMP alternatives, the following general criteria were considered:

- Consider the overall management emphasis intended for each alternative.
- Recognize all applicable special area designations and all land use allocations as VRM classifications are applied.
- Assure that other management activities and land uses being provided for in a specific area may be achieved within the VRM Class objective being set, consistent with special area designations and land use allocations.
- Use the least restrictive class that still achieves objectives to attain desired future conditions.

Setting VRM Class objectives that would make it difficult to achieve management activities or uses identified elsewhere within each plan alternative was avoided during the allocation process. The least restrictive class that would still achieve visual objectives to attain desired future conditions was considered and applied. For example, VRM Class I was typically assigned to those areas where congressionally and administratively decisions have been or will be made to preserve a natural landscape.

VRM Class standards and guidelines are set by Bureau policy and the critical concepts are summarized here (see also Visual Resources Table 2.8, I.B, Resource Standards and Guidelines):

VRM Class I	VRM Class II
Preserve existing character Natural ecological changes Very limited management activity Change-very low Must not attract attention	Retain existing character Changes repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape Management activities may be seen Change-low Should not attract attention of casual observer
VRM Class III	VRM Class IV
Partially retain existing character Changes should repeat the basic elements in the predominant natural features of the characteristic landscape (management activities not addressed) Change-moderate May attract attention but should not dominate the casual observer's view	Allow major modifications of existing character Make every attempt to minimize the impact of activities through careful location, minimal disturbance, and repeating the basic elements Provide for management activities which require major modifications of existing landscape character Change-major May dominate the view and be the major focus of viewer attention

B. Specific Criteria for VRM Classes by Alternative

The following specific criteria were used to define VRM classes by alternative and are reflected on the GIS maps and in the acreage numbers in this Draft Plan/DEIS.

Alternative B

Class I

- Designated Wilderness (BLM)
- Lake Mead Proposed Wilderness (NPS)
- Selected Areas having wilderness characteristics (Scenic Quality Class A; slopes greater than 30 degrees with no potential for vegetation restoration/treatment)
- Areas having wilderness characteristics in Parashant Canyon and Lower Andrus Canyon
- Within Vermilion Cliffs National Monument (Vermilion), all Scenic Quality Class A areas.

Class II

- Grand Canyon-Parashant National Monument (Parashant) areas outside Class I areas above or Class IV areas below
- Vermilion areas outside Class I areas above
- All Areas of Critical Environmental Concern (ACECs)
- Areas that could be seen from three different vantage points in St. George, Utah area
- Selected areas having wilderness characteristics for Alternative B
- ¼ mile buffer off Historic and Recreation Trails outside Virgin River/I-15 corridor
- Virgin Ridge Special Recreation Management Area (SRMA)
- Virgin River Gorge Recreation Withdrawal

Class III

- All remaining area in the Arizona Strip Field Office (FO) not already listed above or in Class IV below

Class IV

- Utility Corridor
- Mineral Material Sites
 - 100 ft buffer off of known Free Use Permit areas
 - 500 ft buffer off of Common Use or Community Pits
 - Boundary of Mineral Material Sale areas
- Gypsum Mine area outside St. George, Utah

Alternative CClass I

- Designated Wilderness (BLM)
- Lake Mead Proposed Wilderness (NPS)
- Selected Areas having wilderness characteristics (Scenic Quality A; slopes greater than 30 degrees, no potential for vegetation restoration/treatment)
- Areas having wilderness characteristics in Parashant Canyon, and Lower Andrus Canyon
- Within the Vermilion, the intersection of Scenic Quality Class A areas and Areas having wilderness characteristics.

Class II

- Western part of Parashant outside potential vegetation restoration/treatment areas and Class I areas above or Class III below
- Vermilion areas outside Class I areas above
- Areas that can be seen from three different communities in St. George, Utah area
- Selected areas having wilderness characteristics for Alternative C
- ¼ mile buffer off Historic and Recreation Trails
- Virgin Ridge Special Recreation Management Area (SRMA)
- Virgin River Gorge Recreation Withdrawal

Class III

- Eastern part of Parashant where there is strong potential for future vegetation restoration/treatment
- All remaining area in the Arizona Strip FO not already listed above or in Class IV below

Class IV

- Utility Corridor
- Mineral Material Sites
 - 100 ft buffer off of known Free Use Permit areas
 - 500 ft buffer off of Common Use or Community Pits
 - Boundary of Mineral Material Sale areas
- Gypsum Mine outside St. George, Utah

Alternative DClass I

- Designated Wilderness (BLM)
- Lake Mead Proposed Wilderness (NPS)

Class II

- Western part of Parashant outside potential vegetation restoration/treatment areas and Class I areas above or Class IV below
- Vermilion areas outside Class I areas above
- Areas that can be seen from three different vantage points in St. George, Utah area
- Selected areas having wilderness characteristics under Alternative D
- ¼ mile buffer off Historic and Recreation Trails
- Virgin Ridge Special Recreation Management Area (SRMA)
- Virgin River Gorge Recreation Withdrawal

Class III

- Eastern part of the Parashant where there is strong potential vegetation restoration/treatment
- All remaining area in the Arizona Strip FO not already listed above

Class IV

- Utility Corridor
- Mineral Material Sites
 - 100 ft buffer off of known Free Use Permit areas
 - 500 ft buffer off of Common Use or Community Pits
 - Boundary of Mineral Material Sale areas
- Gypsum Mine outside St. George, Utah

Alternative EClass I

- Designated Wilderness (BLM)
- Lake Mead Proposed Wilderness (NPS)

Class II

- Western part of Parashant outside potential vegetation treatment areas and Class I areas above or Class IV below
- Vermilion areas outside Class I areas above
- All ACECs
- Areas that can be seen from three different vantage points in St. George, Utah area
- Selected Areas having wilderness characteristics (slopes greater than 30 degrees, no potential for vegetation treatment or restoration)
- Areas having wilderness characteristics in Parashant Canyon and Lower Andrus Canyon
- ¼ mile buffer off Historic and Recreation Trails outside Virgin River/I-15 corridor
- Virgin Ridge Special Recreation Management Area (SRMA)
- Virgin River Gorge Recreation Withdrawal

Class III

- Eastern part of the Parashant with potential vegetation restoration/treatment
- All remaining area in the Arizona Strip FO not already listed above or in Class IV below

Class IV

- Utility Corridor
- Mineral Material Sites
 - 100 ft buffer off of known Free Use Permit areas
 - 500 ft buffer off of Common Use or Community Pits
 - Boundary of Mineral Material Sale areas
- Gypsum Mine outside St. George, Utah

LANDS IDENTIFIED FOR DISPOSAL					
Legal Description	Acres	Authority for Disposal*			
		Alternative A - No Action	Alternative B	Alternatives C, D, E	
T. 39 N., R. 6 E., sec. 27, SW1/4SW1/4;	40.00	FLPMA 206	None	None	
sec. 33, that portion east of Hwy 89A; (acres estimated)	160.00	A&AIA	None	None	
sec. 34, W1/2W1/2.	160.00	A&AIA	None	None	
T. 39 N., R. 7 E., sec. 7, that portion between the wilderness boundary, Hwy 89A, Vermilion Cliffs Lodge, and Badger Creek Subdivision; (acres estimated)	44.00	FLPMA 206	FLPMA 203 & 206, R & PP, FLTFA	FLPMA 203 & 206, R & PP, FLTFA	
T. 40 N., R. 3 E., sec. 34, SE1/4NE1/4, S1/2NW1/4SE1/4, N1/2SW1/4SE1/4, SE1/4SE1/4, S1/2NE1/4NE1/4, SE1/4NE1/4SW1/4, and NE1/4SE1/4SW1/4.	160.00	FLPMA 206	None	None	
T. 41 N., R. 8 E., sec. 17, S1/2;	320.00	FLPMA 203 & 206, R&PP	None	None	
sec. 18, SE1/4;	160.00	FLPMA 203 & 206, R&PP	None	None	
sec. 19, NE1/4;	160.00	FLPMA 203 & 206, R&PP	None	None	
sec. 20, NW1/4;	160.00	FLPMA 203 & 206, R&PP	R&PP	R&PP	
sec. 21, N1/2N1/2.	160.00	None	R&PP	R&PP	
T. 34 N., R. 8 W., sec. 15, S1/2SE1/4SW1/4;	20.00	FLPMA 206	None	None	
sec. 22, W1/2W1/2NE1/4.	40.00	FLPMA 206	None	None	
T. 35 N., R. 10 W., sec. 4, lots 1 to 4, inclusive, S1/2N1/2, and S1/2;	642.68	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP	

LANDS IDENTIFIED FOR DISPOSAL				
Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 8, N1/2;	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 9, N1/2 and SE1/4;	480.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 11, S1/2NW1/4.	80.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 36 N., R. 10 W.,				
sec. 20, S1/2;	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 28, W1/2;	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 29, NE1/4;	160.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 33, W1/2.	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 39 N., R. 1 W.,				
sec. 22, N1/2NE1/4.	80.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 39 N., R. 5 W.,				
sec. 7, E1/2;	320.00	FLPMA 206	None	None
sec. 8, N1/2.	320.00	FLPMA 206	None	None
T. 39 N., R. 6 W.,				
sec. 3, lots 1 and 2, S1/2NE1/4, and SE1/4;	319.98	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 10, E1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 11, S1/2;	320.00	FLPMA 206	None	None
sec. 15, N1/2;	320.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 20, N1/2NE1/4.	80.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 39 N., R. 16 W.,				
sec. 3, SW1/4SE1/4;	40.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 3, N1/2NE1/4SW1/4;	20.00	FLPMA 206		
sec. 4, lot 2;	39.97	FLPMA 203 & 206	FLPMA 203 & 206, FLTFA	FLPMA 203 & 206, FLTFA
sec. 5, lots 2 and 3, inclusive, N1/2 lot 6, and N1/2SW1/4SE1/4; (acres estimated)	118.21	FLPMA 203 & 206	FLPMA 203 & 206, FLTFA	FLPMA 203 & 206, FLTFA

LANDS IDENTIFIED FOR DISPOSAL

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 8, lot 4, SE1/4SW1/4, and S1/2SE1/4;	157.49	None	None	FLPMA 203 & 206, R&PP
sec. 9, SW1/4NE1/4 and SE1/4;	200.00	FLPMA 206	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 9, SW1/4;	160.00	None	None	FLPMA 203 & 206, R&PP
sec. 10, W1/2NE1/4, SE1/4NW1/4, and NE1/4SE1/4;	160.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 17, lots 1 to 4, inclusive, and W1/2E1/2.	312.64	None	None	FLPMA 203 & 206, R&PP
T. 40 N., R. 5 W.,				
sec. 6, lots 2, 3, 4, and 7, SE1/4SW1/4, and SW1/4SE1/4.	196.44	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 6, E1/2SE1/4.	80.00	FLPMA 206	None	None
T. 40 N., R. 6 W.,				
sec. 1, lots 1 to 4, inclusive, SE1/4NE1/4, SW1/4NW1/4, and W1/2SW1/4;	270.36	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 3, lots 1 and 2, S1/2NE1/4, and SE1/4;	294.90	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 4, SW1/4 and W1/2SE1/4;	240.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 5, lots 3 and 4, S1/2NW1/4, E1/2SW1/4, and SE1/4;	375.29	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 6, lot 7, SE1/4SW1/4, and SE1/4;	237.55	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 7, lots 1 to 4, inclusive, E1/2, and E1/2W1/2;	630.16	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 8, NW1/4NW1/4;	40.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 9, all;	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA

LANDS IDENTIFIED FOR DISPOSAL

Legal Description	Acres	Authority for Disposal*			Alternatives C, D, E
		Alternative A – No Action	Alternative B	Alternative C, D, E	
sec. 17, S1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 18, lots 1 to 4, inclusive, E1/2, and E1/2W1/2;	630.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 19, lots 1 and 2, NE1/4, and E1/2NW1/4;	314.98	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 20, all;	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 27, E1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 34, E1/2.	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 40 N., R. 7 W.,					
sec. 1, lots 1 to 4, inclusive, S1/2N1/2, and S1/2;	625.64	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 6, S1/2NE1/4;	80.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 12, all;	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 13, all.	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 40 N., R. 15 W.,					
sec. 4, lot 6; (1994 RMP Amendment)	18.31	FLMPA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 4, S1/2SE1/4 above Virgin River Rim; (acres estimated)	75.00	FLPMA 203 & 206	None	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 6, lots 1 to 7, inclusive, S1/2NE1/4, SE1/4NW1/4, and E1/2SW1/4;	462.88	FLPMA 206	None	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 19, lots 1, 2 (part), and 3 (part), inclusive, west of Virgin River and above rim. (acres estimated)	60.94	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 40 N., R. 16 W.,					

LANDS IDENTIFIED FOR DISPOSAL

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 13, SE1/4NE1/4, S1/2SW1/4, and SE1/4 east of I-15; (acres estimated)	220.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 23, E1/2NE1/4, SE1/4, and SE1/4SW1/4 east of I-15; (acres estimated)	260.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 24, N1/2, SW1/4, N1/2SE1/4, and SW1/4SE1/4;	600.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 33, N1/2NE1/4 and NW1/4;	240.00	FLPMA 206	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 34, N1/2NW1/4 north of I-15; (acres estimated)	60.00	FLPMA 206	None	FLPMA 203 & 206, R&PP, FLTFA
sec. 34, N1/2NW1/4 south of I-15. (acres estimated)	20.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 35, SW1/4SW1/4. (1994 RMP Amendment)	40.00	FLPMA 206	None	None
T. 41 N., R. 2 W.,				
sec. 10, E1/2;	320.00	FLPMA 203 & 206, R&PP	None	None
sec. 10, E1/2W1/2, SW1/4 NW1/4, and W1/2SW1/4;	280.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 15, E1/2;	320.00	FLPMA 203 & 206, R&PP	None	None
sec. 15, W1/2;	320.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 22, all;	640.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 23, N1/2;	320.00	FLPMA 206	None	None
sec. 23, S1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 24, NW1/4;	160.00	FLPMA 206	None	None
sec. 24, SW1/4;	160.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA

LANDS IDENTIFIED FOR DISPOSAL

Legal Description	Acres	Authority for Disposal*			Alternatives C, D, E
		Alternative A - No Action	Alternative B	Alternative C, D, E	
sec. 26, all;	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 33, E1/2, E1/2NW1/4, and SW1/4;	560.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 34, N1/2 and SW1/4;	480.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 35, N1/2N1/2.	160.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 41 N., R. 5 W.,					
sec. 17, N1/2N1/2N1/2NE1/4 and N1/2N1/2N1/2NE1/4NW1/4;	30.00	None	FLPMA 203 & 206	FLPMA 203 & 206	FLPMA 203 & 206
sec. 20, W1/2NW1/4;	80.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 30, lot 3, NE1/4SW1/4;	79.40	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 30, lot 4, SE1/4SW1/4;	79.31	FLPMA 206	None	None	None
sec. 31, lots 1 to 4, inclusive, E1/2, and E1/2W1/2;	638.52	FLPMA 206	None	None	None
T. 41 N., R. 6 W.,					
sec. 5, lot 11 and SE1/4SW1/4;	80.73	FLPMA 206	None	None	None
sec. 8, W1/2E1/2E1/2 and NW1/4SE1/4; (acres estimated)	120.00	FLPMA 206	None	None	None
sec. 16, S1/2;	320.00	FLPMA 203 & 206, R&PP	None	None	None
sec. 25, E1/2SE1/4;	80.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 31, S1/2NE1/4, SE1/4NW1/4, NE1/4SW1/4, N1/2SE1/4, and SE1/4SE1/4;	280.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 33, S1/2;	320.00	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA

LANDS IDENTIFIED FOR DISPOSAL

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
sec. 34, S1/2;	320.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 35, NE1/4 and S1/2.	480.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 41 N., R. 7 W.,				
sec. 4, lots 3 and 4, SW1/4NE1/4, S1/2NW1/4, NE1/4SW1/4, N1/2SE1/4, SE1/4SE1/4;	360.39	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 10, SE1/4NE1/4 and NE1/4SE1/4;	80.00	None	A&AIA	A&AIA
sec. 13, lots 1 to 4, inclusive, NE1/4SW1/4, and W1/2SW1/4;	237.74	FLPMA 203 & 206, A&AIA	FLPMA 203 & 206, R&PP, FLTFA, A&AIA	FLPMA 203 & 206, R&PP, FLTFA, A&AIA
sec. 14, lots 1 to 8, inclusive, S1/2NW1/4, NW1/4SW1/4, S1/2SW1/4, E1/2SE1/4;	451.84	FLPMA 203 & 206, A&AIA	FLPMA 203 & 206, R&PP, FLTFA, A&AIA	FLPMA 203 & 206, R&PP, FLTFA, A&AIA
sec. 23, N1/2NE1/4 and NE1/4NW1/4;	120.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 26, S1/2NE1/4 and S1/2;	400.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 35, all.	640.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 41 N., R. 11 W.,				
sec. 6, lots 1 and 2, S1/2NE1/4, and SE1/4;	321.25	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 7, NE1/4.	160.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 41 N., R. 12 W.,				
sec. 6, lots 1 to 5, inclusive, SE1/4NW1/4;	237.74	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 7, lots 1 to 4 inclusive, E1/2, and E1/2W1/2 east of 500 kV powerline; (acres estimated)	635.76	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 8, SW1/4NW1/4 and W1/2SW1/4.	120.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA

LANDS IDENTIFIED FOR DISPOSAL				
Legal Description	Acres	Authority for Disposal*		
		Alternative A - No Action	Alternative B	Alternatives C, D, E
sec. 18, NE1/4 and NE1/4NW1/4 portion east of 500 kV powerline; (acres estimated)	100.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 41 N., R. 13 W., sec. 1, S1/2NE1/4, SE1/4NW1/4, and SE1/4 only portion east of 500 kV powerline; (acres estimated)	280.00	FLPMA 203 & 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 1, SW1/4NW1/4 portion west of 500 kV powerline and W1/2SW1/4; (acres estimated)	120.00	FLPMA 203 & 206	None	None
sec. 12, NE1/4 and NE1/4SE1/4 portions east of 500 kV powerline. (acres estimated)	120.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 41 N., R. 15 W., sec. 28, SW1/4SW1/4SW1/4; (triangle-acres estimated) (1994 RMP Amendment)	5.00	FLPMA 206	None	None
sec. 31, E1/2; sec. 33, lot 8, SW1/4NE1/4, NW1/4SE1/4, N1/2SW1/4SE1/4, SE1/4SW1/4SE1/4;	320.00	FLPMA 206	None	None
sec. 33, lots 7 and 9 to 13, inclusive, and E1/2E1/2SE1/4SW1/4;	114.86	FLPMA 203 & 206, R&PP	None	None
sec. 34, S1/2NE1/4 above Virgin River Rim; (acres estimated)	64.76	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
sec. 35, SE1/4 all south of I-15. (acres estimated)	60.00	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 42 N., R. 6 W., sec. 32, W1/2SW1/4SE1/4NE1/4SW1/4 and E1/2SE1/4SW1/4NE1/4SW1/4.	160.00	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
sec. 32, W1/2SW1/4SE1/4NE1/4SW1/4 and E1/2SE1/4SW1/4NE1/4SW1/4.	2.50	None	None	FLPMA 203 & 206, R&PP

LANDS IDENTIFIED FOR DISPOSAL

Legal Description	Acres	Authority for Disposal*		
		Alternative A – No Action	Alternative B	Alternatives C, D, E
T. 42 N., R. 7 W.,				
sec. 33, lots 2, 3, and 4, and S1/2.	393.74	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
T. 42 N., R. 11 W.,				
sec. 31, lots 1 and 2, and SE1/4.	202.46	None	FLPMA 203 & 206, R&PP	FLPMA 203 & 206, R&PP
T. 42 N., R. 12 W.,				
sec. 31, lots 1 and 2, and N1/2SE1/4;	139.98	FLPMA 206	None	None
sec. 31, lots 3 to 6, inclusive, E1/2SW1/4, and S1/2SE1/4.	296.41	FLPMA 206	FLPMA 203 & 206, R&PP, FLTFA	FLPMA 203 & 206, R&PP, FLTFA
TOTAL ACRES	30840.21			

*Authority for Disposal;

FLPMA 203 – Federal Land Policy and Management Act, Section 203

FLPMA 206 – Federal Land Policy and Management Act, Section 206

FLTFA – Federal Land Transaction Facilitation Act

R&PP – Recreation and Public Purposes Act

A&AIA – Airport and Airways Improvement Act

APPENDIX 2.N

ALLOTMENT MANAGEMENT STATUS AND ALLOTMENT MANAGEMENT PLAN STATUS

ALLOTMENT MANAGEMENT STATUS AND ALLOTMENT MANAGEMENT PLAN STATUS

Resource Area: Arizona Strip Field Office

Allotment Name	Allotment Number	Management Status ²	AMP ³	Current Mgt
Antelope	05206	M	A	Rest-Rotation
Antelope Spring	05210	I	A	Best Pasture
Atkin Well	05207	I	A	Deferred
Badger Creek	05341	M	A	Deferred
Beanhole Well	05334	I	A	Deferred
Beaver Dam Slope	04828	M	A	Deferred
Black Canyon	05256	C		Winter Spring
Black Knolls	05264	I	A	Rest-Rotation
Black Rock	04841	I	A	Deferred
Blake Pond	04813	M	A	Deferred
Brown-Shumway	05302	M	A	Deferred
Button	05308	C	A	Winter Spring
Canaan Gap	05205	I	A	Deferred
Cane Beds	05212	M	A	Season Long
Cedar Knoll	05318	M	A	Rest-Rotation
Cedar Pockets Ut	04866	I	A	Deferred
Cedar Ridge	05303	C	A	Spring
Cedar Wash	04842	I	A	Winter
Chatterly	05307	I	A	Deferred
Clay Spring	04845	M	A	Deferred
Clayhole	05215	I	A	Best Pasture
Cottonwood	05209	M	C	Deferred
Cowboy Butte	05310	M	A	Rest-Rotation
Coyote	05327	I	A	Deferred
Coyote Spring	04805	I		Winter Spring
Crosby Tank	05219	I	A	Deferred
Diamond Butte	04833	I		Seasonal Rotation
Fern Tank	05217	I	A	Best Pasture
Ferrin	05246	C		Winter Spring
Flat Top Well	05214	I	A	Deferred
Franks Reservoir	05325	I	A	Rest-Rotation
Fuller Road	05324	I	A	Deferred
Glazier Dam	05202	M	A	Deferred
Grama Point	05233	M	A	Deferred
Gramma Spring	05225	C	A	Winter Spring
Gulch	05230	C		Winter Spring

² Management Status equates to the category that the allotment has been placed in reference to management intensity: I=Improve, M=Maintain, C=Custodial (See details below)

³ Under the AMP label A= AMP developed, C=Coordinated management plan developed.

Resource Area: Arizona Strip Field Office

Allotment Name	Allotment Number	Management Status	AMP	Current Mgt
Gunsight	05320	I	A	Deferred
Hacks	05227	C	A	Winter Spring
Harris Well	05238	C		Winter Spring
Hat Knoll	04867	I	A	Deferred
Head Of Hacks	05232	I	A	Deferred
Herd House	00096	M		Winter Spring
Highway	04812	I	A	Winter
Highway	05309	C	A	Season Long
Home Ranch	05342	C		Winter Spring
Homestead	05253	I	A	Deferred
House Rock	05331	I	A	Deferred
Hurricane Cliff	05251	M		Winter Spring
Hurricane Rim	00114	M	A	Deferred
Ivanpah	04858	M	A	Deferred
Iverson	04834	C		Season Long
Jackson Tank	04830	M	A	Deferred
Jacob Canyon	05317	M	A	Winter Spring
Joe	05245	C		Season Long
Johnson Run	05330	M	A	Deferred
June Tank	05221	I	A	Rest-Rotation
Kanab Creek	05321	C	A	Winter Spring
Kanab Gulch	05224	C		Winter Spring
Lamb Tank	05257	M	A	Rest-Rotation
Lambing-Starvation	04838	M	A	Deferred
Lane	05271	C		Winter Spring
Lime Spring	02012	I		Seasonal Rotation
Little Tank	04853	M	A	Deferred
Little Wolf	04814	M	A	Rest-Rotation
Littlefield	04843	I		Seasonal Rotation
Littlefield Comm.	04827	I		Seasonal Rotation
Lizard	04857	M	A	Deferred
Loco Point	05260	I	A	Deferred
Lost Spring Gap	05316	C	A	Winter Spring
Lower Hurricane	04837	I	A	Best Pasture
Mainstreet	04808	M	A	Best Pasture
Mesquite Community	04832	I	A	Season Long
Moonshine	05237	M	A	Deferred
Mormon Well	04844	I		Winter
Mountain Sheep	04824	C		Winter Spring
Mud And Cane Spring	04850	I	A	Deferred
Muggins Flat	05313	I	A	Rest-Rotation

Resource Area: Arizona Strip Field Office

Allotment Name	Allotment Number	Management Status	AMP	Current Mgt
Mustang Spring	04859	I	A	Deferred
Navajo Wells Ut	05348	M	A	Deferred
Pat's Pond	04862	C		Season Long
Pigeon Tank	05322	I	A	Deferred
Pipe Valley	05242	M		Season Long
Pocum	04871	M		Season Long
Pocum Tank	04840	M	A	Deferred
Point Of Rock	05241	M		Season Long
Pratt Tank	05314	M	A	Rest-Rotation
Purgatory	04831	I	A	Winter Spring
Quail Canyon	04856	M	A	Deferred
Rider	05305	M	A	Winter Spring
Rock Canyon	00099	C		Winter Spring
Rock Canyon Tank	05319	I	A	Deferred
Rock Pockets	05213	M	A	Deferred
Rock Reservoir	05345	I	A	Deferred
Sage	05311	C		Winter Spring
Scotties Seep	05236	I	A	Deferred
Shinarump	05301	C		Summer & Fall
Short Creek	05270	C	A	Season Long
Shuttleworth	05315	M	A	Winter Spring
Soap Creek	05332	I	A	Winter Spring
State Line	05244	C	C	Season Long
Suicide	05323	I		Winter Spring
Sullivan Canyon	04810	I	A	Deferred
Sunshine	04863	I	A	Deferred
Sunshine Tank	05247	I	A	Deferred
Swapp Tank	05248	M	A	Deferred
Temple Trail	05216	I	A	Deferred
Toquer Tank	04861	M	A	Deferred
Tuckup	00097	M	A	Deferred
Valley Wash	05234	M	A	Rest-Rotation
Wells	05208	M	C	Season Long
White Pockets	05243	M		Season Long
White Sage	05349	I	A	Rest-Rotation
Whiterock-Soapstone	04804	M	A	Deferred
Wildband	05223	I	A	Deferred
Wolfhole Canyon Sp	04811	I	A	Deferred
Wolfhole Lake	04823	I	A	Deferred
Wolfhole Mountain	04839	M	A	Deferred
Yellowstone	05263	I	A	Deferred

Resource Area: Vermilion NM

Allotment Name	Allotment Number	Management Status	AMP	Current Mgt
Bunting Well	04847	M	A	Deferred
Ferry Swale	05336	M	A	Deferred
Sand Hills	05328	I	A	Rest-Rotation
Signature Rock	05350	I	A	Hgm 8 Past
Wahweap	05340	C		Season Long

Resource Area: Parashant NM

Allotment Name	Allotment Number	Management Status	AMP	Current Mgt
Belnap	04849	I		Summer
Belnap West	04822	M		Winter
Big Spring Pipeline	04870	M	A	Deferred
Cottonwood	04809	I	A	Deferred
Dripping Spring	04818	M	A	Winter Spring
Duncan Tank	04820	M	A	Deferred
Hidden Hills	04825	I	A	Summer & Fall
Hidden Spring	04803	I		Season Long
Imlay	04817	I	A	Winter Spring
Jump Canyon	04801	I	A	Winter Spring
Last Chance	04815	M	A	Deferred
Link Spring	04819	I	A	Deferred
Mosby	04835	M	A	Deferred
Mosby-Nay	04836	I		Deferred
Mt Trumbull	04826	M	A	Deferred
Mt. Logan	05218	I	A	Deferred
Mule Canyon	04821	M	A	Deferred
Pakoon	04802	M	A	Winter Spring
Pakoon Springs	04800	I		Season Long
Parashaunt BLM AMP	04829	M	A	Deferred
Pa's Pocket	04848	I	A	Winter Spring
Penns Well	04852	M	A	Rest-Rotation
Red Pond	04806	M	A	Deferred
Sullivan Tank	04816	M	A	Deferred
Tassi	04851	I		Unavailable
Tuweep	05220	I	A	Rest-Rotation
Wildcat	04854	I	A	Deferred

ALLOTMENT CATEGORIZATION CRITERIA

Maintain (M)

- (a) Present range condition is satisfactory.
- (b) Allotments have high or moderate resource potential and are producing near their potential (or trend is moving in that direction.)
- (c) No serious resource-use conflicts/controversy exist.
- (d) Opportunities may exist for positive economic return from public investments.
- (e) Present management is satisfactory.
- (f) Other criteria appropriate to the ES area.

Improve (I)

- (a) Present range condition is unsatisfactory.
- (b) Allotments have high to moderate resource production potential and are producing at low to moderate levels.
- (c) Serious resource-use conflicts/controversy exists.
- (d) Opportunities exist for positive economic return from public investments.
- (e) Present management appears unsatisfactory.
- (f) Other criteria appropriate to the ES area.

Custodial (C)

- (a) Present range condition is not a paramount factor.
- (b) Allotments have low resource production potential, and are producing near their potential.
- (c) Limited resource-use conflicts/controversy may exist.
- (d) Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors.
- (e) Present management appears satisfactory or is the only logical practice under existing resource conditions or land ownership pattern.
- (f) Other criteria appropriate to the ES area.

APPENDIX 2.0

RECLAMATION STIPULATIONS

- (1) Other criteria appropriate to the FS area.
- (2) Resource conditions of land ownership (tenure).
- (3) Present management approach - suitability to the site (logical practice under existing conditions).
- (4) All management low resource production (suitable) and not producing as a high yield crop.
- (5) Timber/energy - use of existing/developing practices.
- (6) All management low resource production (suitable) and not producing as a high yield crop.
- (7) Present management approach is not a timber/energy crop.
- (8) Other criteria appropriate to the FS area.

RECLAMATION STIPULATIONS

Appendix 2.N is a list of #general requirements for preserving and protecting the special environmental and unique resource values of the Arizona Strip. These requirements will guide the formulation of specific stipulations, construction and/or operating standards which will be applied to surface-disturbing activity. They are designed to provide public land users with a clear understanding of what constitutes prevention of unnecessary or undue degradation and what is required for reclamation. These requirements are supported by FLPMA, the Organic Act, and other environmental laws. Suitable site-specific stipulations regarding construction and reclamation and the prevention of unnecessary or undue degradation will be developed by the authorized officer and applied to each authorization In order to minimize long-term impacts and ensure that sites are effectively reclaimed.

UNNECESSARY OR UNDUE DEGRADATION

1. All surface disturbance, including road construction and associated travel, shall be kept to the minimum necessary to accomplish the task. Road upgrade and realignment requests on BLM lands shall include plans for reclamation and a proposal for a post-operations final alignment.
2. All new temporary or existing upgraded roads on BLM lands may require mitigation to reduce the potential adverse impact of fugitive dust as specified by the authorized officer.
3. Where soil characteristics warrant, topsoil shall be stockpiled from a surface depth specified by the authorized officer.
4. All surface-disturbing activities on slopes greater than 15 percent shall include measures to stabilize soils and control surface water runoff.
5. During construction and operation of facilities or improvements, care shall be taken to minimize, to the extent practicable, impacts to the natural and human environments. This may be accomplished through the painting or screening of structures and facilities to blend with the surrounding environment; the suppression of dust and noise; the proper disposal of waste products; and provisions to safeguard public safety.
6. Coloration products may be required along travel corridors and in VRM Class II areas to reduce color contrast and restore the natural color balance.
7. Construction and reclamation activities shall be designed to minimize long-term impacts to natural lines, form, textures and color contrast. Reclamation methods shall avoid disturbing more area or exposing greater color contrast than resulted from the original operation.
8. All facilities or improvements that are no longer needed must be removed.

9. In order to protect the wildlife, the public or other important values and discourage unnecessary public contact with authorized activities, the authorized officer may require improvements or facilities to be fenced, gated and locked.
10. Mineral material disposal in Arizona Strip FO VRM Class II areas shall not be allowed if reasonable alternative sources are available in other VRM classes. Any mineral material disposal sites authorized in VRM Class II shall not compromise the VRM class objectives.
11. All powerlines on BLM lands shall be constructed to minimize visual impacts. This may include burying them along existing roads in VRM Class II, ACECs or RCAs.
12. Applicants shall supply, at the discretion of the authorized officer, pertinent information regarding Impacts from the proposal on surface and groundwater quality and quantity and anticipated impacts from 100-year, 24-hour storm events.
13. All forms of residential occupancy are discouraged on public lands within the Arizona Strip District and prohibited on NPS lands. Exceptions may occur on BLM lands for the protection of public health and safety, the protection of private property. With regard to locatable mineral development on Arizona Strip FO lands, occupants must be actively and diligently engaged in substantially continuous operations. Intermittent, part time, seasonal or recreational mining operations do not meet district occupancy standards. All plans for residential occupancy must be fully incorporated into submitted notices and plans. All proposals for residential occupancy shall be subject to the requirement to prevent unnecessary or undue degradation and shall comply with all applicable state and federal laws, regulations and permits. Residential occupancy not in conformance with applicable laws, Bureau guidelines and district policy will be subject to immediate trespass action by the Bureau.
14. Applicants may be required by the authorized officer to provide inventories for threatened or endangered plants and/or animals and cultural resources. All Inventories shall be performed to Bureau or NPS standards.
15. No surface disturbance shall be authorized which would impact any cultural sites prior to consultation with the State Historic Preservation Officer (SHPO) and threatened or endangered species prior to compliance with the Endangered Species Act.
16. No surface disturbance will be authorized which would impact any cultural property that is allocated to Conservation Use in an approved Cultural Resource Management Plan.

RECLAMATION

1. Reclamation of all surface disturbances must be initiated immediately upon completion of activities, unless otherwise approved by the authorized officer. Reclamation of disturbed areas shall, to the extent practicable, include contouring disturbances to blend with the surrounding

terrain, replacement of topsoil, smoothing and blending the original surface colors to minimize impacts to visual resources, and seed the disturbed areas with a mix specified by the authorized officer.

2. All chemicals, trash, garbage or other foreign material must be removed completely from the project area by the applicant immediately upon completion of the project. All material must be properly disposed of in an approved disposal facility. Exceptions to this limitation shall be approved by the authorized officer.

3. At no time shall vehicle or equipment fluids be dumped on public lands. All accidental spills must be reported to BLM or NPS and be cleaned up immediately, using best available practices and requirements of the law. All spills of federally or state listed hazardous materials which exceed the reportable quantities shall be promptly reported to the appropriate state agency and the Arizona Strip District.

4. Disturbed areas, where soil and rainfall are adequate for anticipated success, shall be revegetated. In all VRM Class II areas, ACECs and RCAs revegetation of native species shall be preferred. Rates and seed mixes shall be determined by the authorized officer.

5. Revegetation efforts must establish a stable biological groundcover equal to or exceeding that which occurred prior to disturbance. Mulching may be appropriate for conserving moisture and holding seed on-site thus improving the chances for successful establishment.

6. All unnecessary roads shall be reclaimed and dosed immediately upon termination of the project. Recontouring all cut slopes to approximately the original contour shall be required. Reclaimed roads shall be barricaded or signed to protect them until reclamation is achieved. All existing roads that require upgrading shall be reclaimed to their original dimensions upon completion of the project. Exceptions must be approved in writing by the authorized officer.

APPENDIX 2.P

MINERALS AND ASSOCIATED LAND CATEGORIES

DECLARATION

I, the undersigned, do hereby declare that the information provided in this report is true and correct to the best of my knowledge and belief.

MINERALS AND ASSOCIATED LAND CATEGORIES

A. Fluid Mineral Leasing Categories

The current leasing policy for fluid minerals employs four land categories to protect natural and human resources while providing maximum opportunity for exploration and development. The categories are:

- 1) open to leasing with standard stipulations;
 - 2) open to leasing with special terms and conditions or seasonal restrictions;
 - 3) open to leasing with no surface occupancy; and
 - 4) closed to leasing. Exploration, drilling and production would be subject to the applicable operation and reclamation standards.
-

Category 1: Open to lease subject to standard lease terms and conditions.

Category 2: In order to protect peregrine falcon during the nesting season, exploration, drilling and other surface-disturbing activities will be allowed only during the period from August 1 through March 1. This limitation does not apply to the maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that no adverse impacts to peregrine falcon would occur.

In order to protect bighorn sheep, exploration, drilling and other surface-disturbing activities will be allowed only during the period from June 1 through November 30. This limitation does not apply to the maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that adverse impacts to the bighorn sheep would not occur.

In order to protect desert tortoise, exploration, drilling and other surface-disturbing activities will be allowed only during the period from October 15 through March 15, subject to waivable no surface occupancy stipulations. This limitation does not apply to the maintenance and operation of producing wells. Surface occupancy could be allowed by the authorized officer after consultation with the U.S. Fish and Wildlife Service on authorizing a particular Application for a Permit to Drill.

Category 3: In order to protect important scenic values, no surface occupancy or other surface disturbance will be allowed within the Virgin River Gorge scenic withdrawal. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed disturbance or occupancy will not substantially impair the visual resources of the area.

In order to protect important scenic values, no surface occupancy or other surface disturbance will be allowed within Kanab Creek, Grama Canyon or the Virgin River Gorge. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed disturbance or occupancy will not substantially impair the visual resources of the area.

In order to protect important scenic values, no surface occupancy or other surface disturbance will be allowed on slopes in excess of 30 percent along or within the following areas: the north slopes of Mokiatic and Seegmiller mountains; Hurricane Cliffs; Diamond Butte; upper and lower Grand Wash Cliffs; Parashant, Andrus, Hidden, and Dansil canyons; and the Moccasin Mountains. Exceptions to this limitation may be specifically authorized in writing by the authorized officer of the federal surface management agency if it is shown to the satisfaction of the authorized officer that the proposed disturbance or occupancy will not impair the visual resources of the area.

Category 4: In order to protect national monuments and wilderness values, lands are withdrawn from minerals leasing. The Vermilion Cliffs National Monument encompasses the Paria Canyon-Vermilion Cliffs Wilderness. The Grand Canyon-Parashant National Monument encompasses Mount Trumbull Wilderness, Mt. Logan Wilderness, Grand Wash Cliffs Wilderness and part of the Paiute Wilderness. Outside of the monuments the Paiute Wilderness, the Beaver Dam Mountains Wilderness, the Cottonwood Point Wilderness, and the BLM administered portion of the Kanab Creek Wilderness.

In addition to the fluid mineral leasing categories the following conditions apply to special status species and riparian resources.

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to

result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. 1531 *et seq.*, including completion of any required procedure for conference or consultation.

Riparian and riparian-related resources: Oil and gas, 43 CFR 3101.1-2 allows the Authorized Officer to require activities to be moved up to 200 meters to protect specific resources. The authorized officer may apply this regulation adjacent to riparian zones where site-specific analysis shows a need to further protect riparian-related resources, including Southwest willow flycatcher habitat and nesting sites.

B. Locatable Mineral Land Classifications

Locatable mineral exploration and development work is governed by the 43 CFR 3809 regulations. These regulations require the filing of a notice or a plan of operations prior to the start of operations, excluding casual use, on Federal lands. A notice is required to be filed at least 15 calendar days before commencing exploration causing a surface disturbance of 5 acres or less on which reclamation has not been completed. BLM approval is not required prior to the start of exploration conducted under a notice. Plan of operations are required to be submitted and approved for any bulk sampling that will remove 1,000 tons or more of presumed ore for testing and any mining operations causing surface disturbance in excess of casual use. Surface disturbing activities related to notices and plan of operations would be subject to the operation and reclamation standards contained in Appendix 2.N. Classification of public lands to operation of the mining laws are: Areas Open; Areas Open with Restrictions; Areas Open with a Plan of Operation; and Areas Closed.

Areas Open to the Mining Laws

All public lands in the ASFO with the exception of those lands identified below, are open to the operation of the mining laws. Wilderness areas, national monuments and the Grand Canyon game preserve are closed to the operation of the mining laws. Valid existing rights, however, must be recognized. These rights must be supported by the discovery of a valuable mineral as of the date of designation.

Areas Open to the Mining Laws with Restrictions

Restricted areas are those lands where mining locations are subject to special requirements of law and regulation as a result of powersite withdrawals, public water reserves, and split-estate created under the Stockraising Homestead Act. Additional restrictions could apply in riparian areas or if threatened or endangered species are involved, as stated below.

Areas along the Virgin River drainage, Beaver Dam Wash, Paria River, Kanab Creek and any and all wetlands are protected by provisions on the Wetlands Executive Order (ED 11990, May 24, 1977) and the Floodplain Management Executive Order (EO 11988, May 24, 1977), to avoid or reduce adverse impacts.

In accordance with U.S. Fish and Wildlife consultation requirements under Section 7 of the Endangered Species Act and the Bald Eagle Protection Act, actions necessary to prevent disturbance to threatened and endangered species or golden eagles are required. As such, exploration activities are not allowed to be conducted within certain sensitive periods or within influence zones.

Areas Open to the Mining Laws with a Plan of Operation

Plan of operations are required to be submitted and approved prior to commencing operations in the following special status areas; areas in the National Wild and Scenic Rivers System, and areas designated for potential addition to the system; Designated Areas of Critical Environmental Concern; areas designated as part of the National Wilderness Preservation System and administered by BLM; areas designated as "closed" to off-road vehicle use; any lands or waters known to contain Federally proposed or listed threatened or endangered species or their proposed or designated critical habitat, unless BLM allows for other action under a formal land-use plan or threatened or endangered species recovery plan.

Areas Closed to the Mining Laws

Subject to the valid existing rights, wilderness areas, national monuments, the Virgin River Gorge scenic area, Grand Canyon game preserve and acquired land not formally opened to the operation of the mining laws are closed to the operation of the mining law.

C. Mineral Material Land Classification

Mineral material disposal is discretionary and applications can be denied in cases where the disposal is not in the best public interest. Mineral material disposal sites would be subject to the operation and reclamation standards contained in Appendix - for surface disturbing activities. Classification of public lands for mineral material disposal are; Areas Open Subject to Standard Terms and Conditions, Areas Open with Restrictions, and Areas Closed.

Category 1. Areas Open to Mineral Material Disposals Subject to Standard Terms and Conditions

Category 2. Areas Open to Mineral Material Disposals Subject to Restrictions

Category 3. Restricted areas are those lands where mineral material disposals are subject to special requirements of law and regulation as a result of unpatented mining claims,

powersite withdrawals, split-estate created under the Stockraising Homestead Act and acquired lands under the Taylor Grazing Act. In addition, material disposal in VRM Class II areas would not be allowed if reasonable alternative sources are available.

Category 4. Areas Closed to Mineral Material Disposal

These are lands in wilderness areas, national monuments, the Virgin River Gorge scenic withdrawal, designated Areas of Critical Environmental Concern, except that existing material site will be evaluated for retention in Johnson Spring, Lost Spring Mountain and Moonshine Ridge ACECs, and where there are conflicting non-mineral applications or entries pending which involve title to the mineral estate, such as sales or exchanges.

power to... Arizona Strip Mineral Material Sites

These are... Arizona Strip Mineral Material Sites

APPENDIX 2.Q

ARIZONA STRIP MINERAL MATERIAL SITES

Faded text content, likely a list or table of sites, including names and locations.

Arizona Strip Mineral Material Sites

Township	Range	Section	Legal Description	Authorization Type*	Commodity
34N	9W	19	S2SWNENW	Cold Springs FUP AZA-30993	Soil, Fill
35N	8W	8	S2SESE	Uinkaret FUP AZA-30994	Cinders
37N	7W	32	SWNW,NWSENW	Black Canyon Wash FUP AZA-32475	Sand, Gravel
38N	4W	22	NESWSE NWSESE	Buffalo Ranch Rd FUP AZA-32808	Sand, Gravel
38N	15W	27	NESWSE	Jacob Well FUP AZA-28201	Sand, Gravel
38N	16W	33	NWSESWSE	Eye of Needle FUP AZA-28202	Sand, Gravel
39N	3E	27	SESESE	North House Rock FUP	Gravel
39N	4E	31	LOT 4,W2SESW	AZ SHWY ROW AZPHX-86098	Gravel
39N	7E	18	NESW	Badger Canyon CP AZA-32841	Stone
39N	7E	18	N2NESW,S2SENW	Badger Canyon CU AZA-32923	Flag Stone
39N	2W	13 24	S2SWSW, SWSESW N2NWNW, NWNENW	Little Cedar Knoll CP/FUP AZA-30563/32471	Gravel
39N	3W	6	SENENW	Bitter Seeps CP/FUP AZA-30565/32005	Flag Stone
39W	4W	23	E2NWNE,W2NENE NESESW	Bullrush Stone NS AZA-29441	Flag Stone
39N	6W	34	NENESW,E2NWNESW S2SWSWNE,SESENW	Yellowstone Mesa CP/FUP AZA-30564/32004	Sand, Gravel
39N	12W	11	NWNWSE,NENESW	CC Gravel Pit FUP AZA-30992	Soil, Fill
39N	12W	25	NWSWNW	Wolfhole Valley FUP AZA-31990	Soil, Fill
39N	16W	4	NWNE	Mesquite Vistas NS AZA-30880	Sand, Gravel
39N	16W	4	N2NWSW	Flat Top Dam FUP AZA-31100	Soil, Fill
40N	3E	15	N2NWSE,S2SWNE	West Valley Pit FUP	Gravel
40N	1W	2	E2NESWSW N2SESW,NWSWSE	AZ SHWY ROW AZAR-9440	Gravel
40N	6W	5	SESENWSW	Landfill Clay Pit FUP AZA-30883	Clay
40N	9W	26	NWNW	Antelope Road FUP AZA-32710	Soil, Fill

Township	Range	Section	Legal Description	Authorization Type*	Commodity
40N	12W	26	NESENW	Quail Flat Gravel Pit FUP AZA-31985	Soil, Fill
40N	15W	9	NWSW	Littlefield Rock CUA AZA-31985	Sand, Gravel, Stone
40N	16W	24	SW	Big Bend Wash FUP AZA-33012	Soil, Fill
41N	3E	11	SENE	Coyote Valley Gravel FUP AZA-31989	Soil, Fill
41N	1W	34	N2NWSE	AZ SHWY ROW AZPHX-78901	Gravel
41N	2W	5	LOT 3 (40 acres)	AZ SHWY ROW AZPHX-86767	Gravel
41N	2W	5	SENW W2W2SWNE	AZ SHWY ROW AZPHX-78886	Gravel
41N	7W	14	S2SESW,N2NENW	Airport Pit CP/FUP AZA-27367/32006	Sand, Gravel
41N	9W	3	N2NESW,SWSENW	Antelope Pit CP AZA-32388	Flag Stone

* Authorization Type;

CP – community pit, CUA – common use area, FUP – free use permit, ROW – right-of-way

APPENDIX 2.R

RECREATION MANAGEMENT AREAS

Recreation Management Areas

1. OVERVIEW

Two types of Recreation Management Areas (RMA) would be identified in the land use plan for BLM lands; Special Recreation Management Areas (SRMA) and Extensive Recreation Management Areas (ERMA). In the Parashant only, Special Management Area(s) (SMA) would be identified on NPS lands.

2. SPECIAL RECREATION MANAGEMENT AREAS (SRMAs)

SRMAs would be identified in the planning process as areas with a distinct primary recreation-tourism market as well as a corresponding and distinguishing recreation management strategy. Each SRMA would be focused on the most appropriate recreation market strategy; either Community, Destination, or Undeveloped. SMAs typically involve the NPS proposed wilderness areas, as well as any areas having wilderness characteristics. SRMA/SMAs would undergo further activity-level planning following the completion of the LUP.

In identifying SRMAs and prescribing the management regime for each, and to the extent feasible with the information on-hand, a benefits-based management (BBM) approach would be utilized, although it is integrated with more traditional planning. BBM or “beneficial outcomes” planning focuses on the outcomes of recreation and leisure activities to determine how the experiences benefit the visitor and uses this information as the premise for the planning process. BBM analyzes the “why” people visit an area and participate in a particular activity. Recent visitor surveys as well as public scoping comments and input from cooperating entities were used to develop the appropriate proposed recreation strategy for each SRMA.

a. Recreation Management Strategies

Each SRMA identified has a distinct, primary recreation-tourism market as well as a corresponding and distinguishing recreation management strategy. For each SRMA selected, that primary market-based strategy would be to manage for one of three possibilities: a *destination* recreation-tourism market, a *community* recreation-tourism market, or an *undeveloped* recreation-tourism market. Each is defined below:

Community recreation-tourism market ~ a community or communities dependent on public lands recreation and/or related tourism use, growth, and/or development. Major investments in facilities and visitor assistance are authorized within SRMAs where BLM’s strategy is to target demonstrated community recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand for specific activity, experience, and benefit opportunities. They are produced by maintaining prescribed natural resource and/or community setting character and by structuring and implementing management, marketing, monitoring, and administrative actions accordingly.

Destination recreation-tourism market ~ national or regional recreation-tourism visitors and other constituents who value public lands as recreation-tourism destinations. Major investments in facilities and visitor assistance are authorized within SRMAs where BLM's strategy is to target demonstrated destination recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand for specific activity, experience, and benefit opportunities. These opportunities are produced through maintenance of prescribed natural resource setting character and by structuring and implementing management, marketing, monitoring, and administrative actions accordingly.

Undeveloped recreation-tourism market ~ national, regional, and/or local recreation-tourism visitors, communities, or other constituents who value public lands for the distinctive kinds of dispersed recreation produced by the vast size and largely open, undeveloped character of their recreation settings. Major investments in facilities are excluded within SRMAs where BLM's strategy is to target demonstrated undeveloped recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand to sustain distinctive recreation setting characteristics; however, major investments in visitor services are authorized both to sustain those distinctive setting characteristics and to maintain visitor freedom to choose where to go and what to do—all in response to demonstrated demand for undeveloped recreation.

While Destination and Community SRMAs are targeting for demands that may require major facilities and visitor assistance as stated above, Undeveloped SRMAs target for a demand that may require only visitor services, not major facilities, to sustain distinctive settings and maintain the unstructured, freedom to choose activities appropriate in undeveloped settings. It should be noted that "visitor freedom to choose where to go and what to do" does not mean freedom from rules, regulations, travel restrictions, etc., but it refers to the visitors' ability to choose from a variety of unstructured, dispersed recreation activities and locations, versus choosing more structured recreation opportunities tied to specific places and activities in the other two types of SRMAs.

b. Primary Market-Based Strategies identified in the Plan

Each SRMA from Alternative C through E, identifies a distinct primary recreation-tourism market as well as a corresponding and distinguishing recreation management strategy. Each SRMA focuses on the most appropriate recreation market strategy based on preliminary public input; either Community, Destination, or Undeveloped. National Park Service SMA management is blended with SRMA management in two SRMAs in the Parashant.

Parashant SRMA/NPS SMA: The primary strategy for Parashant SRMA/ NPS SMA would be one aimed at an undeveloped recreation-tourism market. Due to its distinctive remote, rugged landscape, its proximity to Grand Canyon, its vast size and the largely open, undeveloped character of its recreation settings, regional and local recreation-tourism visitors value this area for the distinctive kinds of dispersed recreation it produces. There is a demonstrated recreation-

tourism market demand from local community and regional/national visitors for trophy hunting opportunities, guided back country tours, hiking, viewing and appreciating wildland landscapes and cultural sites, canyoneering and motorized/mechanized/non-mechanized exploring.

Paria SRMA: The primary strategy for Paria SRMA would be one aimed at a world-class destination recreation-tourism market. Due to its distinctive landscape of spectacular geology and scenery, challenging terrain, and its connectivity to other world-class sites (GSENM, Glen Canyon NRA), recreation-tourism visitors, ranging from local to international, highly value these public lands as recreation-tourism destinations. There is a demonstrated recreation-tourism market demand from community resident, regional, national and international visitors for viewing unique geology, experiencing a world class slot canyon, backpacking and hiking, appreciation of cultural resources, and hunting.

Gateways SRMA: The primary strategy for Gateways SRMA would be one aimed at a destination recreation-tourism market. Due to its distinctive pathways through a spectacular Northern Arizona landscape of scenic and historic values; its connectivity to other world-class sites (Grand Canyon, GSENM, Lees Ferry); its potential for interpretive facility development by partnering with local recreation providers, recreation-tourism visitors, ranging from local to international, highly value these public lands as recreation-tourism destinations. There is a demonstrated recreation-tourism market demand from regional, national and international visitors for viewing spectacular geology, driving an Arizona State Scenic Road, visiting rustic lodges, viewing natural/cultural history sites and exhibits, and hiking.

Sand Hills SRMA: The primary strategy for Sand Hills SRMA would be one aimed at an undeveloped recreation-tourism market. Due to its distinctive remote, rugged landscape, its vast size and the largely open, undeveloped character of its recreation settings, regional and local recreation-tourism visitors value this area for the distinctive kinds of dispersed recreation it produces. There is a demonstrated recreation-tourism market demand from local community and regional/national visitors for hunting opportunities, guided back country tours, hiking, viewing and appreciating wildland landscapes and cultural sites, and motorized/mechanized/non-mechanized exploring.

Virgin River SRMA: The primary strategy for Virgin River SRMA would be one aimed at a destination recreation-tourism market. Due to its distinctive location along high traffic volume Interstate Highway 15, its place in the Grand Canyon-like landscape of Virgin River Gorge, and ease of access for day and overnight recreation, national, regional, and local recreation-tourism visitors value these public lands as recreation-tourism destinations. There is a demonstrated recreation-tourism market demand from mainly local community residents and regional visitors for day-use and overnight hunting, hiking, family outings, rock climbing, school group field outings (elementary to university), and white water activities. Similarly, there is market demand from local, regional and national visitors for sightseeing, appreciation of geologic resources, rest from travel and escaping the cold winter weather of other locations.

Virgin Ridge SRMA: The primary strategy for Virgin Ridge SRMA would be one aimed at a community recreation-tourism market. Due to its distinctive landscape, its close proximity to the rapidly growing communities of Mesquite, Bunkerville, Logandale, and Overton, NV and Beaver Dam, Scenic and Littlefield, AZ, local recreation-tourism visitors value these public lands as their own 'back-yard' recreation settings. There is a demonstrated recreation-tourism market demand from primarily local communities, as well as some other regional visitors, for motorized/mechanized/non-mechanized exploring, world-class rock climbing, guided middle and front country

St. George Basin SRMA: The primary strategy for St. George Basin SRMA would be one aimed at a community recreation-tourism market. Due to its distinctive landscape, warm winters, and its close proximity to the rapidly growing communities of St. George, Santa Clara, Middleton, Washington, Hurricane and Toquerville, Utah, local recreation-tourism visitors value these public lands as their own 'back-yard' recreation settings. There is a demonstrated recreation-tourism market demand from primarily local communities, as well as some other seasonal regional visitors, for motorized/mechanized/non-mechanized exploring, technical sports, fitness activities, guided middle and front country tours, sightseeing, equestrian, hiking, competitive and organized events, viewing and appreciating natural landscapes and cultural sites.

Fredonia SRMA: The primary strategy for Fredonia SRMA would be one aimed at a community recreation-tourism market. Due to its distinctive landscape and its close proximity to the communities of Fredonia, AZ and Kanab, Utah, local recreation-tourism visitors value these public lands as their own 'back-yard' recreation settings. There is a demonstrated recreation-tourism market demand from primarily local communities, as well as some regional visitors, for motorized/mechanized/non-mechanized exploring, managed target shooting, fitness activities, sightseeing, equestrian, hiking, competitive and organized events, viewing and appreciating natural landscapes and cultural sites.

c. Recreation Management Zones

Within each SRMA, one or more potential Recreation Management Zones (RMZs) were identified, with each zone providing a particular recreation niche. (See Maps 2.7, 2.16, 2.25, and 2.34 for SRMAs with RMZs). Each RMZ was characterized by a description of its desired outcomes (management objective(s), benefits, experiences, activities) and setting prescriptions (physical, social, and administrative conditions required to produce the outcomes.[see Appendix 3.H, Recreation Opportunity Spectrum]) Each RMZ within a SRMA is thus presented to show what the favorite activities would likely be, the experiences derived from participation, and the benefits realized. Additionally, an activity planning framework (see below) was described that addresses basic but broad types of recreation actions (management, marketing, monitoring, and administration) that would achieve desired outcomes.

3. EXTENSIVE RECREATION MANAGEMENT AREAS (ERMAs)

Anything not delineated as a SRMA would be an Extensive RMA (ERMA). ERMAs would only receive the custodial management of visitor health and safety, user conflict and resource protection issues with no activity level planning. Therefore, actions within ERMAs are generally implemented directly from land use plan decisions. Land use plan decisions identified in the various sections of Chapter 2, Table 2.10a Recreation and Visitor Services include recreation management objectives for all ERMAs, as well as custodial recreation management, marketing, monitoring, and administrative support actions.

4. ACTIVITY PLANNING FRAMEWORK

The activity planning framework is intended to outline the essential conditions or structure for implementing actions for SRMAs. This section addresses the structural framework for all actions to be taken by BLM and its collaborating community recreation-tourism providers who affect both recreation setting character and the kinds of recreation opportunities being produced in SRMAs. The framework addresses recreation management, marketing, monitoring, and administrative support actions necessary to achieve the various explicitly stated recreation management objectives and setting prescriptions found in the tables below.

Unless the essential conditions or structure are met, neither management objectives nor prescribed recreation setting character can be achieved because implementing actions are the engine that makes everything happen. In other words, "What is the operating structure to which BLM and its collaborating providers must commit so that planned recreation management objectives and recreation setting prescriptions will, in fact, be achieved?" Much of this structure is found in the Chapter 2, Table 2.10a Recreation and Visitor Services under Part C, Actions to Achieve and Allowable Uses. The following content supplements the Chapter 2 content.

a. Recreation-Tourism Service Delivery System

To implement LUP decisions within the SRMAs, a recreation-tourism service delivery system must be in place and engaged. The delivery system is that combination of public lands and adjoining service communities, including local governments and service providing businesses through which recreation and visitor services are delivered for one or more Special Recreation Management Areas to both visitors and affected community residents. Because BLM is not the only provider of essential recreation and visitor services for the Planning Area, the focus of the system must include other service providers within adjoining service communities upon whom visitors and community residents alike depend.

The recreation-tourism delivery system for the Arizona Strip SRMAs involves more than just programs and activities provided on public lands. In addition to BLM, Forest Service, and the National Park Service, local counties, such as Mohave and Coconino in Arizona and Washington

and Kane County in Utah, as well as American Indians, such as the Paiute and Navajo, also contribute to recreation-tourism delivery, primarily through the management of access to and through landscapes. State governments in Arizona and Utah also play important roles in various facets of recreation delivery, including the management of game and fish and recreation activities on state trust lands, creation and funding of grant programs that enhance OHV and non-motorized recreation opportunities, and providing state law concerning vehicle-related licensing.

For the Planning Area SRMAs, local communities such as Littlefield, Scenic, Beaver Dam, Arizona; Mesquite, Bunkerville, Overton, Nevada; St. George, Hurricane, Washington, Santa Clara, Hildale, Big Water, and Kanab, Utah; and Colorado City, Fredonia, Marble Canyon, Beaver Dam, and Page Arizona would continue to contribute to the delivery of recreation-tourism opportunities to local, regional, national, and international visitors and residents.

Non-government recreation providers also play an important role in delivering recreation-tourism outcomes. Many local and regional businesses provide for a variety of direct recreation opportunities in the areas identified as SRMAs that enable customers to realize specific recreation experience outcomes via numerous commercial and competitive activities or events. Many other private sector businesses also provide indirectly, or 'off-site', to the recreation-tourism delivery, such as local bike shops, OHV dealerships, outdoor equipment retailers, hotels, and restaurants. Taken all together, recreation-tourism opportunities on the Arizona Strip are influenced, guided, constrained, and managed by many providers.

Implementing land use plan decisions for SRMAs, collaborative efforts with other key providers would be essential to achieving desired outcomes. Various types of cooperating agreements would be developed to forge sustainable service partnerships with these providers. Additionally, other existing or new "opportunistic" partnerships with users, interest groups, and NGOs would be developed, restructured, expanded, or otherwise tailored to fit within these overarching agreements among all key affected providers.

b. Implementation of Essential Actions

Following the completion of the land use plan, a Recreation Activity Management Plan (RAMP) would be developed for each SRMA through a public process. SRMA plan content would address the variety of specific actions that BLM, NPS and other key collaborating recreation-tourism providers within adjoining communities would undertake to achieve the production of recreation opportunities and resulting attainment of targeted experience and benefit outcomes.

Implementing actions would need to conform to the overall management framework established by the Plan. In other words, as sets of more specific management actions are developed during activity planning, each and every action should conform to the planning criteria, laws, regulations, policies, and planning allocations. Additionally specific management actions need to conform with State and local provider laws and policies that pertain to activities on public lands.

Through the development of specific activity plans for SRMAs, BLM would integrate and constrain all of the traditional recreation-related programs and initiatives (e.g., OHVs and transportation, rivers and trails, permits and fees, concessions management, accessibility, interpretation, facility management, VRM, etc.) to address only those essential functional actions required to achieve planned outcomes. To better focus on achieving integration and balance of the essential implementation actions, BLM would shift the operational framework from the more traditional approach of managing individual recreation programs as discrete objects to the following four functional areas of recreation and visitor services.

- i. **Management** (of resources, visitors, and facilities [i.e., developed recreation sites, roads and trails, recreation concessions, etc.]):

Many of the programs listed above involve recreation management actions, but only those which produce targeted outputs and facilitate the attainment of targeted outcomes would be considered essential. Planned management programs and actions for SRMAs would be constrained by the management framework of the approved RMP, specifically the Recreation and Visitor Services section. By focusing on specific management objectives and settings for each RMZ within a given SRMA, only actions that would directly contribute to achieving objectives and maintaining or enhancing settings would be considered. Planned management programs and actions would be held accountable for how they impact recreation setting character and the kinds of recreation opportunities produced by scheduled evaluations to determine whether or not they contribute to achieving objectives and maintaining settings.

Additionally, planned travel management actions, including route designation actions, would be constrained by recreation management objectives and setting prescriptions, as well as other management objectives related to sensitive resources. Likewise, planned travel-related engineering construction and maintenance actions would be constrained by Travel Management Area setting prescriptions (Appendix 2.B Travel Management Areas, Part D, Route Construction and Maintenance Standards) that are integrated with RMZ setting prescriptions.

- ii. **Marketing** (including outreach, information and education, promotion, interpretation, environmental education, and other visitor services):

Marketing actions must match planned management actions. Marketing is where BLM tells its customers that it is providing precisely what it said it would (i.e., implementing actions designed to achieve outcomes). Not all implementing actions would be done by BLM when other providers are involved, so marketing likewise tells customers other providers are doing what they said they would do.

As part of marketing, definitive information about recreation setting character and activity, experience, and benefit opportunities would be integrated into BLM's own information and other outreach media. BLM would also work more closely with industry media through collaborative

efforts to add definitive content to existing and planned industry outreach media and messages to ensure that promotional pieces match customers with the opportunities they seek rather than sell them what media wants. It would be essential that all entities involved with marketing, both BLM and industry media, know and understand:

- how each SRMA is targeting a specific recreation-tourism market and who that market is and where it is located;
- how each such market has one or more specific recreation niches that prescribe RMZ-specific recreation setting characteristics critical to the production of specific outcomes of activity, experience, and benefits; and
- what the ramifications of “off-target” promotional efforts can be; and
- that only the marketing tools (e.g., information, promotion, education, interpretation, etc.) that are best suited for each locale, would be selected as implementing actions.

iii. **Monitoring** (including social, environmental, and administrative indicators and standards (including outreach, information and education, promotion, interpretation, environmental education, and other visitor services):

Various monitoring frameworks would be set in place for BLM and its collaborating partners to implement specific planned monitoring actions. Monitoring recreation outcomes and prescribed recreation setting character attainment is what would drive adaptive management. Monitoring is where outcomes and settings would be measured to gauge if, when, and how to readjust management and marketing actions to achieve standards set for the indicators that were chosen (i.e., monitoring indicators and standards would be extracted directly from the outcomes-based management objectives and setting prescriptions).

Limits of Acceptable Change (LAC) would be the primary framework used to clarify the identity of the indicators, inventory the indicators, evaluate data and set standards for the indicators, and monitor selected indicator sites over time to assess the condition and trend of various recreation settings. In addition to LAC, visitor satisfaction and preference surveys would be used to evaluate the success or failure achieving the objectives. BLM would use standard, approved survey instruments while other providers may employ other methods to monitor conditions and achievement of objectives.

In implementing specific monitoring actions, BLM’s collaborating providers would be encouraged to assist by providing visitor and community assessments. A monitoring plan would facilitate achieving the essential conditions needed for coordinated, integrated, efficient monitoring actions to occur.

iv. **Administrative Support** (regulations; permits and fees, including use restrictions where necessary and appropriate; recreation concessions; fiscal; data management; and customer liaison)

Administrative actions, such as those listed above, would be implemented only if they ensure that they:

- support rather than lead the management, marketing, and monitoring actions
- do not thwart the attainment of targeted experience and beneficial outcomes,
- fit within recreation setting prescriptions
- are all complementary and balanced with each other, and
- are limited to only those necessary to achieve all of the above.

APPENDIX 2.S

TRAVEL MANAGEMENT AREAS, TRANSPORTATION PLAN CONTENTS, AND APPROPRIATE ROUTE CONSTRUCTION AND MAINTENANCE STANDARDS BY TRAVEL MANAGEMENT AREA

TRAVEL MANAGEMENT AREAS, TRANSPORTATION PLAN CONTENTS, AND APPROPRIATE ROUTE CONSTRUCTION AND MAINTENANCE STANDARDS BY TRAVEL MANAGEMENT AREA

A. Travel Management Areas (TMAs)

Comprehensive travel management planning addresses all resource use aspects (such as recreational, traditional, casual, agricultural, commercial, and educational) and accompanying modes and conditions of travel on the public lands. In the Plan, four TMAs (polygons) have been delineated in Chapter 2, Table 2.6, Trails and Travel Management I.B.1., TMAs. Acceptable modes of access and travel for each TMA (including over-land and fly-in access [remote airstrips]) were identified in the same table at Trails and Travel Management I.C.2.a., Allowable Uses. In developing these areas, the following components were considered:

- a. management units developed in the plan
- b. consistency with all resource program goals and objectives;
- c. primary travelers;
- d. objectives for allowing travel in the area;
- e. setting characteristics that are to be maintained (including recreation opportunity system and VRM settings); and
- f. primary means of travel allowed to accomplish the objectives and to maintain the setting characteristics.

Following the completion and approval of the Plan, a transportation plan would be developed that would coordinate the implementation of the Trails and Travel Management and Transportation Facilities decisions over the life of the Plan. The potential contents of the transportation plan are shown below. The transportation plan would also include Appropriate Route Construction and Maintenance Standards by TMA, also shown in Section C below.

Transportation Plan Contents

Following the completion and approval of the Resource Management Plan, implementation and management of the defined travel management network (a system of areas, roads and/or trails that would be available for public use, and the specific limitations placed on use) would be documented in the transportation plan including, as a minimum, the following components:

- a. A map that displays and describes the intended use of the individual geographic units within the planning area and displays roads and trails for all travel modes.

- b. A listing of specific road types and designations such as Federal, state, county, and Tribal roads, BLM administered/maintained roads, and BLM public roads.
- c. A listing of roads in congressionally designated conservation units, Presidential conservation designations, and administrative conservation designations such as areas of critical environmental concern.
- d. Definitions and additional limitations for specific roads and trails (defined in 43 CFR 8340.0-5(g)).
- e. Criteria to add new roads or trails and to specify limitations.
- f. A set of guidelines for management, monitoring, and maintenance of the system.
- g. A set of indicators to guide future plan maintenance, amendments, or revisions related to travel management network.
- h. A list of needed easements and rights-of-ways (to be issued to the BLM or others) to maintain the existing road and trail network providing public land access.
- i. A schedule for periodic review of travel management networks to ensure that current resource and travel management objectives are being met (see 43 CFR 8342.3).

2. Preliminary Route Network

Where specific route designation decisions and a subsequent designated system were not practical to define or delineate during the land use planning process, a preliminary network identified during that effort would be documented and a process would be established to select a final travel management network following the completion of the Resource Management Plan. As a separate section of the transportation plan, the following components, as a minimum, would be included for the preliminary route network (the uncompleted travel management network):

- a. A map of a preliminary road and trail network;
- b. Any LUP-defined short-term management guidance for road and trail access and activities in areas or sub-areas not completed;
- c. An outline additional data needs, and a strategy to collect needed information;
- d. A clear planning sequence, including public collaboration, criteria and constraints for subsequent road and trail selection and identification;
- e. A schedule to complete the area or sub-area road and trail selection process within 5 years of the signing of the ROD for the RMP; and
- f. A list of any easements and rights-of-ways (to be issued to the BLM or others) needed to maintain the preliminary or existing road and trail network.

C. Route Construction and Maintenance Standards						
Appropriate Route Construction and Maintenance Standards by TMA						
Functional Class 1 and Access Vehicle Type	Route Type2	Route Width3 (ft)	Maintenance Level4	Maintenance Frequency	Speed (mph)	Comments
Rural TMA						
State, Federal	Primary Paved, Secondary Paved	Varies	High standards		55-75	State maintenance
Collector-all vehicle types	Primary Unpaved, Secondary Unpaved	20-28	4-5	1	40-50	Mainly County and BLM routes
Local-all vehicle types	Secondary Unpaved	14-20	3-4	2-3	20-40	Mainly BLM
Resource-high clearance or 4X4	Tertiary, Single Track	10-14	2	4	10-15	Maintenance is typically as needed, site-specific
Non-system	Closed, Reclaiming, Abandoned	--	--	--	--	Routes to be closed and rehabilitated
Backways TMA						
Collector-all vehicle types	Primary Unpaved, Secondary Unpaved	20	4-5	1	40-50	Mainly County and BLM routes
Local-all vehicle types	Secondary Unpaved	14-20	3-4	2-3	20-40	Mainly BLM
Resource-high clearance or 4X4	Tertiary, Single Track	10-14	2	4 or none	5-15	Maintenance is typically as needed, site-specific
Non-system		--	--	--	--	Routes to be closed and rehabilitated
Specialized TMA						
Local-all vehicle types	Secondary Unpaved	14	3	2-3	20-30	
Resource-high clearance or 4X4	Tertiary, Single Track	10 or two-track	2	4 or none	5-15	Maintenance is typically as needed and/or site-specific
Resource-hiking, biking, or equestrian	Single Track	Varies	2	2	≤15	Non-motorized use year-round
Non-system	Closed, Reclaiming, Abandoned	--	--	--	--	Routes to be closed and rehabilitated
Primitive TMA						
Resource-high clearance or 4X4	Tertiary, Single Track	10, two-track	2	4 or none	5-15	Administrative motorized use and open to non-motorized public use. Maintenance is typically as needed, site-specific
Non-system	Closed, Reclaiming, Abandoned	--	--	--	--	Routes to be closed and rehabilitated
						Native tread surface to nonnative tread for interpretive trails
						Native tread surface, widths to be determined
						Native tread surface, widths to be determined

C. Route Construction and Maintenance Standards

Appropriate Route Construction and Maintenance Standards by TMA

1. Functional Classes from BLM Manual Section 9113: Collector: These BLM roads normally provide primary access to large blocks of land and connect with a public road system. Local: These BLM roads normally serve a smaller area than collectors. Local roads carry fewer traffic types. User cost, comfort, and travel time are secondary to construction and maintenance cost considerations. Resource: These BLM roads normally are spur roads that provide point access and connect to local or collector roads. Use restrictions can be applied to prevent conflicts between users. Minimal consideration for user cost, comfort or travel time. Non-system: Routes that will not be included in the transportation system.

2. Route Type: Derived from formal route inventory, which uses these standard types for inventory on BLM and U.S. Forest Service jurisdictions and for Arizona State Trust Lands.

3. Route Width: Width of travel surface only. Does not include associated ditches, bridges, culverts, route cut and fill areas, etc.

4. Route Maintenance Levels :

Level 1 - No Maintenance: Roads no longer needed and closed to traffic. Closure devices maintained, drainage stabilized to protect adjacent lands and resource values.

Level 2 - Minimal Maintenance: Roads normally open seasonally or year-round and passable for high clearance or 4-wheel drive use. Drainage and grade inspected every 3 years and maintained to correct problems.

Level 3 - Maintenance as Needed: Roads open seasonally or year round. Typically natural or aggregate surfaced, but may include low-use bituminous surface, with defined cross-section and drainage. Generally passable by passenger car, but user comfort and convenience are not a high priority. Drainage inspected at least annually and maintained as needed. Grading conducted to provide a reasonable level of riding comfort.

Level 4 - Annual maintenance. Roads open all year, except may be closed or have limited access seasonally. Typically single or double lane, aggregate, or bituminous surface, with a higher volume of public traffic than administrative traffic. Roadway maintained at least annually, although a preventative maintenance program may be established. Problems repaired as discovered.

Level 5 – In addition to a scheduled maintenance program, these roads have a preventative maintenance program established to maintain the integrity of the system.

APPENDIX 2.T

ROUTE EVALUATION TREE PROCESS©

Route Evaluation Tree Process[©]

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The Route Evaluation Tree Process[©] (Route Evaluation Process[©]) is a tool designed to assist with route evaluation as a basis for creating a successful travel management plan. It builds upon the history of past efforts of route evaluation and designation, assists with addressing the various issues and concerns raised by both private and public entities, and incorporates and assists with addressing the numerous statutory requirements that are a part of this type of planning effort. The Route Evaluation Process[©] also serves as a tool to help build into the planning process a means by which to achieve desired outcomes that are specifically tailored to the needs and issues unique to a planning area. The Route Evaluation Process[©] allows systematic consideration of the important issues and concerns when evaluating routes. It is not a replacement for NEPA process, documents, or analysis, but rather is a tool designed to assist with the systematic collection of sensitive resource and route use information that can then be subsequently used to evaluate and potentially designate routes.

To address the many facets of route evaluation and transportation planning the Route Evaluation Process[©] is broken into a number of smaller finite tasks or steps, which fine tune the information needed to successfully evaluate and eventually designate routes. The process is illustrated on the attached Route Evaluation Tree Process[©] for Travel Management Planning at the end of this appendix (Attachment 1).

The Route Evaluation Tree^{©4} (see CD in the back of this DEIS for the complete diagram of the Route Evaluation Tree[©]) is one step within the overall Route Evaluation Process[©]. It takes a systematic approach to collect data and evaluate routes individually, as well as collectively, based upon statutory requirements and issues raised by the public, and plan alternative themes. The result of this process is the creation of different potential designated trails and travel management systems that address most, if not all, of the identified issues and constraints. The data collected by using the Evaluation Tree[©] software as part of the Route Evaluation Process[©] may assist agency planners in making potential decisions within the environmental impact analysis process required by the National Environmental Policy Act (NEPA).

⁴ The process has previously been referred to as the "Route Evaluation/Designation Decision Tree Process" or "Decision Tree". A "decision tree" is a technique or tool for assisting in the decision making process by leading one through a series of yes/no questions based upon input received (flowchart). A "decision" in the context of NEPA has a more legalistic meaning specifically relating to the NEPA process. The name "Decision Tree" was used to indicate it was created in a flowchart style, however to avoid the potential for misunderstanding of the meaning of the word "decision", it has been removed from the title of the process. Similarly, the word "designation" has been removed from the title of the process to eliminate potential misunderstanding of the function of the process.

Background

Past efforts at Route Evaluation and Designation:

The process of evaluating and designating routes of travel on public lands is a complicated and often controversial process. Designating routes as either open, closed or limited has become increasingly difficult due to a number of factors such as increased environmental concerns and awareness, urban area expansion into rural areas, decreasing public recreational land base and an increase in outdoor recreation by the public. Previous efforts to formally designate the route system for many large planning areas have often either met with poor results (e.g. not been successfully implemented) or have generally failed. A few designation efforts done at a smaller scale (e.g. various ACECs, etc.) have met with some success, but fewer yet have been successfully implemented. These efforts have not been without significant staff time and cost, public involvement, near-stifling public controversy and have often failed due to the lack of public acceptance of processes that are perceived as not adequately addressing the various issues and concerns raised. This situation has usually led to crippling levels of non-compliance and subsequent impacts to the land from un-managed use.

Review of Key Aspects and Criteria to be used in Route Evaluation and Potential Designation:

Given this history, land use planners endeavor to utilize a route evaluation process that employs the successful aspects of past efforts, avoids their pitfalls and involves the public extensively. Consultation with the architects of past route evaluation and designation efforts, other land use planners and extensive collaboration with the public identified a number of issues and concerns that needed to be addressed if a route evaluation - designation process were to be successful. Many of these issues and concerns were derived from the identification of the shortcomings of other past efforts. Principal amongst these criteria, issues and concerns were the following:

- Evaluate and potentially designate routes utilizing substantiated complete data of a variety of types: e.g. not only biological and cultural, but also recreational resources, commercial uses and land ownership.
- Base route evaluation and potential designation to the extent possible on current ground-truthed maps that reflect a variety information that reflects not only use, but very importantly the relationship of those uses with sensitive resources (i.e. not only location, but also route type, use level, and recreational points of interest such as campsites, staging areas, etc.).
- Base route evaluation and potential designation on a process that is systematic in its approach and that can be logically followed.
- Base route evaluation and potential designation on a process that both assess each route on its own merits/issues (i.e. avoid lumping decisions) and that assesses the uses and influences of the route system on a landscape scale.

- Utilize a route evaluation and potential designation process that tracks and neutrally records the information that is a part of each evaluation.
- Base route evaluation and potential designation on a process that not only identifies the desired future condition, but that also places into motion the potential designation of a potential designated trails and travel management system that at a landscape scale facilitates as its eventual outcome features of that desired future condition.
- Base route evaluation and potential designation on a process that establishes a system of routes that work together in a positive synergistic manner to create a functioning “network”. In order to achieve this synergism systematically assesses both individually and collectively the implications of potential route designation on biological, cultural and recreational resources, as well as the general access requirements of commercial and private property interests.
- Base route evaluation and potential designation on a process that helps to establish a clearer link between the potential route designation decision and the reasons (e.g. biological, commercial, cultural, private property, recreational, conflict, etc.) most affecting the evaluation and that eventual potential designation.
- Base route evaluation and potential designation on a process that systematically involves the public and clearly incorporates their input.
- Base route evaluation and potential designation decisions on a process that considers: the history of use, public safety, public use conflicts, the intensity and season of use and takes into account the various implications of concentrating versus dispersing use.
- Base route evaluation and subsequent potential designation on a process that addresses:
 - both the number and level of influence from each route as well as the collective impact of the route network on the landscape;
 - the number, density and intensity of use of each route in assessing individual route influences, as well as the collective influence of the network of potential designated trails and travel management system on habitat fragmentation and function;
 - the need to minimize or eliminate the number and intensity of conflicting land uses as well as conflicts between users (e.g. urban interface, noise, dust, visual impacts, quiet use zones, etc.).
- Base route evaluation and potential designation on a process that is considerate of the variety of recreational visitors by offering a variety of routes (e.g. 4WD vs. MC vs. ATV; motorized vs. non-motorized; beginner vs. technical motorized routes; easy vs. strenuous hiking routes to address the needs of the young vs. the old) and that is considerate of the length of the typical visitor’s stay by providing enough recreational opportunity for that stay. (The net effect of such considerations has been historically shown to be a decrease in route proliferation.)
- Base route evaluation and potential designation on a process that is considerate of the role and influence of “feeder” routes, is considerate of historic routes and recognizes the statutory need to provide appropriate levels of commercial and private property access.

Recognizing and attempting to address the issues and concerns raised by the public represents only *one*, albeit very important, *aspect* that needs to be considered by a successful route evaluation and potential designation process. A *second aspect* that needs to be specifically addressed by a successful route evaluation/potential designation process *includes the various statutory guidelines that are legally mandated*. An abbreviated summary of some of the principal legal requirements and some of their most important criteria relative to route evaluation and potential designation includes the following:

BLM Planning Handbook Guidance: Guidance for OHV travel management areas and the designation of OHV areas and routes in the context of land use planning is provided in Appendix C.II.D, Comprehensive Trails and Travel Management and Appendix C.IV.C, Transportation Facilities in the Bureau's Land Use Planning Handbook, H-1601 Land Use Planning Handbook, Release 1-1693, 3,11,2005. This guidance applies to "all resource use aspects (such as recreational, traditional, casual, agricultural, commercial, and educational) and accompanying modes and conditions of travel on the public lands, not just motorized or off-highway vehicle activities."

Statute

Federal Endangered Species Act (ESA)

National Environmental Policy Act (NEPA)

Federal Land Policy and Management Act (FLPMA)

Principal Guiding Criteria affecting potential route designation

- Section 7 requires that the plan (i.e. "action") include steps to assist in the "recovery" of the federally threatened or endangered species.
- A principal goal of any planning effort involving federally listed species is to include management goals and associated prescriptions that would lead to a "No Jeopardy" determination from USFWS as part of the Biological Opinion requirement of the ESA.
- This act is regarded first and foremost as a public disclosure law requiring the responsible agency(ies) to fully disclose to the public the purpose, the full range of issues and considerations (including environmental) and details of the proposed action and a reasonable range of alternatives.
- This act emphasizes the need to disclose to the public impacts of the proposed action and then evaluate the cumulative effects of that action. Such an analysis is to include: both the current situation, as well as the foreseeable future; evaluate both direct and indirect impacts both within the geographical borders of the action, as well as beyond and; include as part of its cumulative impact analysis not only an evaluation of biological and cultural factors, but also include an evaluation of economic and sociological factors (including recreation).
- Management of public lands in to be on the basis of multiple use and sustained yield (i.e. no permanent impairment);
- Resource values are to be protected;
- Certain lands are to be preserved in their natural condition;
- Wild, as well as domestic habitat is to be provided for;
- Provide for a balanced and diverse combination of recreational uses;
- Provide for human occupancy and use
- Provide for economic uses (e.g. range, timber, minerals).

- | | |
|--|--|
| National Park Service
Organic Act of 1916 | <ul style="list-style-type: none"> • This act established the National Park Service. Its fundamental purpose is to provide for the conservation of scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. |
| Historic Preservation
Act (HPA) (Section 106) | <ul style="list-style-type: none"> • Protect identified significant cultural sites; • Confer with Native American Nations on project or action (i.e. Nation to Nation conference) |
| Antiquities Act of 1906 | <ul style="list-style-type: none"> • Enables the Presidential establishment of National Monuments to protect areas recognized for their special scientific or historic objects or values. |
| Code of Federal
Regulations
43 CFR 8342.1 | <ul style="list-style-type: none"> a. Trails shall be located in a manner to minimize impacts to the physical resources (i.e. soils, watershed, vegetation, air and other resources) and to prevent impairment of wilderness suitability; b. Trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats; c. Trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors. |
| Code of Federal
Regulations 36 CFR
Part 4 Vehicles and
Traffic Safety | <p>Travel on park roads and designated routes:</p> <ul style="list-style-type: none"> a. Operating a motor vehicle is prohibited except on park roads, in parking areas, and on routes and areas designated for off-road motor vehicle use. b. Routes and areas designated for off-road motor vehicle use shall be promulgated as special regulations. Routes and areas may be designated only in national recreation areas, national seashores, national lakeshores, and national preserves. c. These regulations shall not be construed to prohibit administrative activities conducted by the NPS, or its agents, in accordance with approved general management plans, or in emergency operations involving threats to life, property, or park resources. |
| National Parks and
Recreation Act of 1978 | <ul style="list-style-type: none"> • This act requires NPS to prepare and revise General Management Plans (GMP) in a timely manner for each NPS unit. GMPs must include resource protection measures, general development locations, timing and costs; carrying capacity analysis, and boundary modifications. |
| Taylor Grazing Act | <ul style="list-style-type: none"> • Guarantee the conditional issuance of permits allowing the use of public lands for livestock grazing and mining. |
| Mining Acts | |

The *third principal aspect* of a successful evaluation and potential designation process is the inclusion of steps that ensure that the eventual system or network of routes *helps to collectively achieve the desired future condition*.

The *last principal aspect*, but certainly not the least, of a successful route evaluation and potential designation process, is inclusion of steps which *carefully consider area-specific planning issues and challenges*, and then carefully assesses how **management** protocols designed to **remedy** those issues can best be **implemented**.

Consolidating these four principal aspects of a successful route evaluation and potential designation process into a logical, systematic and recordable process is the challenge that has generally stymied or led to the failure of past route evaluation and designation efforts.

The process of evaluating and potentially designating individual routes route-by-route (Implementation level decisions) is not to be confused with the much broader and more generalized process of evaluating entire “areas” and prescribing potential OHV area designations, such as “Open”, “Limited” and “Closed”(Land Use level decisions). The OHV area designation of “Limited” is often clarified with stipulations such as “Limited to existing routes only” or “Limited to designated routes only”. It is the latter type of situation that leads to the required route-by-route designation and the use of processes like the Route Evaluation Process[©] described herein. Areas given “Open” OHV area designations typically do not have any limitations, allow cross-country motorized use and therefore do not need route-by-route analysis or designation.

The following is a brief description of the Route Evaluation Process[©]. The proper use of the Route Evaluation Process[©] is based upon having a reasonably complete inventory of routes and associated information that is determined to be most useful in evaluating those routes and their use. Although a near 100% inventory is optimal, the use of this process is not absolutely contingent upon having a complete route inventory. Due to the manner in which this process uses software for the collection of data about each route, additional routes and route information can be added as it becomes available. However, due to the manner in which this process requires the “route evaluators” to look beyond individual routes by also taking a landscape perspective, having a more complete route inventory enables the evaluators to be more complete in assessing the implications of the collective route potential designated trails and travel management system. Additionally, because the Route Evaluation Process[©] is designed to help assess the impacts of all types of routes and uses, and because routes of different types (with different uses) can affect not only the environment but also visitors on other routes, the route inventory which is evaluated should not only include motorized routes, but should also include non-motorized routes and non-motorized uses as well.

Preparation for Route Evaluation: Information Gathering Phase (Steps 1 through 8).

Step 1.	Coarsely identify issues for the Planning Area
Step 2a, 2b and 2c.	Identify primary Resource concerns, Access concerns, and Political concerns.
Step 3	Coarsely identify “Desired Future Condition” and Management Objectives for the Planning Area
Step 4a	Break down planning region into sub-regions with similar issues
Step 4b	Identify “Hot Spots of Concern” or primary issues within the Planning Area
Step 5	Identify/refine primary issues for each sub-region
Step 6	Coarsely identify sub-region management objectives
Step 7	Identify priority sub-region(s) and boundaries
Step 8	Coarsely develop potential designated trails and travel management system options principally based upon plan alternatives

Steps 1 and 2a, 2b, and 2c: Utilizing information that is available to agency staff, categorize the most pressing issues by identifying the general primary resource constraints, primary access needs (including most heavily used areas), and political concerns for the entire planning area.

During this step, information regarding the planning area and adjoining areas is discussed to better assist in addressing the collective influence of the potential designated trails and travel management system upon sensitive resources, commercial needs and recreational access. By taking this regional or landscape perspective, various resource or use issues and concerns can begin to be identified, including trends (e.g. shifts in use type, movement of people), population changes, urban interface issues, common uses, undesirable practices (e.g. including activities such as illegal dumping or law enforcement issues), resources receiving more influences, areas which need to be protected or preserved, and/or past, present or future adjoining planning efforts. Through the route evaluation/potential designation process and the associated planning efforts, future human activities can be modified through the plan to address the various resource and use issues identified and affect changes towards the desired future condition (see Step 3).

Step 3: In concert with the general planning process, develop and be familiar with the most general or fundamental aspects of the “Desired Future Condition,” as well as the Management objectives, for the entire planning area, particularly as they relate to the various resource and use issues and concerns identified above. This may include the overall recreation and travel management objectives for the planning area, bearing in mind the appropriate legislation (e.g. National Conservation Areas) or proclamations (e.g. Monument Proclamation) that may direct or have bearing on those decisions.

Development of Sideboards for Different Alternatives (Steps 4 through 8).

Step 4a: As part of this information gathering phase, fine tune the focus of the evaluation process by breaking the entire planning area into “subregions” or some form of smaller planning units (e.g. “Geographical Units” that are approximately defined by similar issues or management goals with tangible borders.

These issues or goals may include similar resource conflicts or constraints, similar management goals (e.g. National Monument Proclamations) or similar access needs or use levels. Where possible, use logical preexisting physical features or management units as boundaries. For example, jurisdictional boundaries (e.g. Monument boundaries), roads, hydrologic drainages, ridges, watershed units, habitat transition zones or ecozones, or Recreational Opportunity Spectrum (ROS) Class boundaries may be utilized.

The purpose of this step is to focus the subsequent analysis on smaller evaluation subunits without losing the overall perspective of the landscape.

Step 4b: Coarsely identify “hot spots” as the high priority subregions where the issues caused by conflicting resource constraints and public access needs are, or at least perceived to be, most pronounced. In some cases the perceived existence of conflict is as important as real conflict, (e.g. if elected officials are wary of any form of route designation, then treat their area of concern as a separate planning unit.)

Step 5: The initial review coarsely identified issues and concerns. Are there others that may have been exaggerated or overlooked in the first coarse analysis? Are there other T&E or sensitive species that really do need to be evaluated in the context of potential route designation and travel management planning that were initially overlooked because they haven’t garnered much attention (e.g. Management Indicator Species, predators, insects, plants)? Are there new recreational activities (e.g. geocaching, rock crawling, modified golf carts, etc.) or any other predictable changes of use or other sensitive resources (e.g. anticipated species listings, “watch lists”, etc.) that may be at risk during the life of the plan that need to be considered with a more thorough analysis?

Step 6: Utilizing the background information gained from establishing the subregions (i.e. issues, constraints, uses, etc.), further fine-tune management objectives and the desired future condition for each subregion and the entire planning area, as deemed appropriate.

Step 7: Identify priority subregions utilizing best available information reflecting the known or perceived priority resource issues/constraints, as well as known or perceived priority access needs or use levels (whether commercial, private or recreational). Create maps of the priority subregions such that the area covered goes beyond that identified in step 4b in order to make sure that the evaluation area boundary is sufficiently large to capture all those adjoining areas that either have similar issues or that may be affected by or affect this planning effort. If possible, utilizing appropriate GIS overlays/coverages, evaluate and confirm that those hot spots identified in step 4b do exist. However, as stated above, some priority subregions may be established due to political needs or

public perceptions that were identified as part of the preliminary information gathering phase .

Step 8: After reviewing the comments received and issues identified during the preliminary information gathering phase, the specific categories of issues and concerns would be created (e.g. permitted ranching practices). The alternatives identified during the planning effort may be used in conjunction with the Route Evaluation Process. Routes may be evaluated according to the alternatives identified during the agencies planning effort so that differing transportation systems may be proposed for each alternative identified. The Route Evaluation Process is responding to the plan alternatives and working in conjunction with them to allow the decision maker a tool to consider the transportation system at a scale that ranges from specific route influences to a larger landscape scale that looks at the implications of portions of, or larger still the entire potential designated trails and travel management system.

Data Refinement (Steps 9 through 12)

Step 9	Identify primary data deficiencies related to primary issues
Step 10	Identify how primary data deficiencies can be addressed
Step 11a, 11b, 11c	Agency Staff, Volunteers, Contractors
Step 12	Rectify Data Deficiencies

Step 9: Utilizing the verified and refined list of issues developed in step 5, identify readily available data sources and their state of refinement (e.g. Are they already in a GIS coverage? Are they ready to be put in a GIS coverage? Are they in a state in which they should be or could be converted? Are they useable?). Identify deficiencies in the data (e.g. Have all the locations of sensitive resources (e.g. riparian zones, wintering grounds, etc.) been mapped? Do all of them have to be mapped or is just a subset needed (i.e. just those sensitive resource locations that are located in tandem with or proximate to travel routes?) Have all of the roads and trails within the priority subregions been mapped? Have all or most of the important campgrounds and staging areas been identified?).

Agency staff make the final determination as to the type of routes evaluated through the Evaluation Tree[©] based upon agency directives and policy. The word “route” may refer to roads, “ways”, trails, etc. whether they are maintained or not, whether they are motorized or not, or any other descriptions that may be appropriate for such “routes.”

In addition to existing routes, the agency may also review and evaluate the data for known proposed routes with the Evaluation Tree[©]. While the route evaluation is being performed, should a new route be proposed, that route may also be evaluated.

Steps 10 and 11: At this point in the assessment of data for the subregions, the highest priority data (i.e. most needed and most useful) and the most pressing data deficiencies have been identified. Those data deficiencies can be closed by either modifying existing data sources or by collecting new/supplemental field data. A determination is needed as to who is capable (i.e. ability and time) of addressing these data deficiencies . For example, it may be determined that route mapping data deficiencies could be best filled by the joint efforts of agency/contractor/volunteer survey crews, the net result of which

might not only include the acquisition of needed route data, but perhaps more importantly beneficial and effective public outreach. On the other hand, data deficiencies concerning the presence/absence of sensitive species or habitat is more likely to require professional expertise leaving that work to specialists either from agency or contractor staff. The determination to use contractor staff, as well as the extent to which they would be utilized, to augment agency staff is dependent upon agency staff expertise, workload, amount of work to be performed and the realities of time and budget constraints.

Step 12: Given that the above steps identified the most important data deficiencies and determined how and by whom they might be filled, determine which of those identified data deficiencies need the most time and are most urgent in order to maintain the planning schedule. Further prioritize the order in which the various data deficiencies are to be addressed by revisiting both the goals of the desired future condition and the priority issues/concerns that need to be addressed in an adequate (legally defensible) route evaluation and potential designation process. Identify which of the data sets may or may not be still useful (e.g. too outdated). Identify which data sets, if properly refined might be useful for route evaluation. Identify the amount of work it would take to properly utilize a data set and perform a cost-benefit analysis to evaluate the net worth to the planning process of refining or updating a data set. Discard from consideration those data sets that are deemed too costly and that won't add significantly to the route evaluation process. Identify which data deficiencies clearly need to be addressed in order to perform an adequate evaluation.

Prepare for Route Evaluation (Steps 13 through 16)

Step 13	Divide each sub-region into sub-subregions to be able to create maps at a scale that can clearly portray the coverage information necessary for route evaluation, e.g. 1:24,000 scale
Step 14	Create maps for each sub-subregion for route evaluation
Step 15	Review plan alternatives and fine tune the travel management and potential designated trails and travel management system objectives for each alternative
Step 16	Refine Route Evaluation Tree [©] (Evaluation Tree [©]) "Evaluation Questions" to insure that identified resource and use issues are adequately addressed

Step 13: Within the subregions, break the area of analysis into smaller evaluation units or sub-subregions. These sub-subregions may be uniformly influenced by access needs, use levels or have similar resource issues/constraints. Often these smaller planning units are defined by the routes which create their borders. These sub-subregions need to be small enough to have sufficient map detail visible from the GIS coverages for use in answering the standardized questions in the Evaluation Tree[©] (e.g. 1:24,000 at the smallest scale; larger scales such as even 1:8000 may be necessary for denser route networks or adequate resource conflict analysis).

Step 14: At this point in the process those issues that are expected to most affect the route evaluation process have been identified and to the extent possible the data concerning those issues has been converted into GIS coverages. Create maps of the

subregions utilizing the best available information reflecting the known or perceived sensitive resource issues/constraints, as well as known or perceived access needs or use levels (whether commercial or recreational).

This data will be displayed as point, line and polygon data. For example, pertinent point data might include nesting or reproductive sites, cultural sites, windmills, gates, or cabins for ranching, mining sites, water catchments for wildlife, campsites, utility sites, etc. Examples of line data would include route location and type, streams, washes, fence lines, pipelines and fence lines. Polygon data might include sensitive/critical habitat designations, migration/movement corridors, culturally sensitive areas, fire history polygons, and land ownership and management boundaries. This information would be portrayed on USGS DRGs base maps which display topographic, hydrologic and other general information useful to the route evaluation process.

Steps 15 and 16: At this stage each subregion and sub-subregion map is reviewed by agency staff and management representing a variety of specialties (e.g. natural and/or cultural resources, recreation, law enforcement, minerals, realty and range management). Past, present and future management concerns and issues are reviewed and discussed. These discussions should focus primarily on the direct and indirect effects the use of various motorized routes are having on resources, law enforcement issues, the distribution of recreation, the types of recreation, land use conflicts and maintenance issues. This review process also needs to include “landscape-level“ discussions regarding sensitive resources (e.g. sage grouse, elk and regional condition of their habitat) and how those sensitive resources might be affected by varying route densities, level and season of use, adjoining land uses and land use planning documents, changing use patterns and trends (e.g. including recreational changes, growth and development patterns, habitat loss and its implications, etc.), specific problem areas and if appropriate the influence of routes on adjoining non-public lands.

The outcome of this lengthy review and discussion should be two-fold. First, the sideboards and management goals for each plan alternative should now be fine-tuned to include guidelines concerning travel management and potential designated trails and travel management system objectives (and would be subsequently reviewed, analyzed, and fully expanded upon in the subsequent NEPA documentation that references output from the Evaluation Tree[©]). Secondly, the standardized Evaluation Tree[©] options would be modified to include specific items resources, issues, uses, and concerns in that planning area. Definitions would be developed for such terms as “proximate” or “zone of influence” based upon the expertise of the agency specialists as they are to be applied to the planning area.

Route Evaluation (Step 17)

Step 17 Evaluate each route utilizing the Evaluation Tree[©]; concurrently enumerate each route and, as needed, each route segment

At this stage of the process, sub-subregion maps have been created, the highest priority resource and use issues have been identified, the standardized Evaluation Tree[©] options have been modified and the manner by which each possible route network would typically address the various issues and concerns have been identified. Routes within the sub-subregion are now selected for evaluation utilizing the Evaluation Tree[©].

Prior to and throughout the route evaluation at this stage, the actual and potential issues and concerns that have been identified in preceding steps are considered to assist with evaluating the routes and developing potential designated trails and travel management systems from a landscape perspective. Not only are the individual routes reviewed, but their influence within the sub-regions and the larger planning area are also evaluated.

Each route is tracked by assigning to it a specific alphanumeric code. This code generally employs a standardized identification convention that includes one to two letters followed by 4 digits (this number may be customized to correspond with the preferences of the planning agency). The letters would represent the first letter of the sub region (e.g. Lake Mead = LM, Royce Canyon = RC). Four or more numerical digits follow, the first of which represents the sub-subregion in which the route either began or ended, followed by next three or more digits that actually represented the route number in that sub-subregion.

If a route has “spur routes” that clearly are sub-segments of that route or if a need to segment a route is identified (e.g. to highlight significant changes in use, condition or influences, or to enable the route evaluation team the opportunity to expand potential designated trails and travel management system options) then further identification of the route follows via the utilization of lower case letters of the alphabet at the end of the route number.

Typically, evaluation starts with the most highly used “feeder” routes and ends with the most lightly used routes, with the focus being on evaluating all routes within a single area (e.g. within a small watershed or a portion of a sub-subregion) until all routes within that area are evaluated. This focus allows areas with similar issues and concerns to be addressed not only on a route-by-route basis, but also with a larger landscape perspective which allows for consideration of the collective implication of the potential designated trails and travel management system within that area. As each route is evaluated, it is enumerated and split, if necessary, to increase the precision of the evaluation and/or expand the potential designated trails and travel management system options.

The process begins by looking at the route characteristics, such as route conditions (e.g., use level, evidence of construction, route type) and designations under previous planning efforts. This data provides the initial background for the route.

The process then progresses through the Evaluation Tree[©] gathering specific information about the routes by answering sequentially a number of questions that are arranged in a sieve-like fashion to address the various statutory sideboards and issues and concerns identified earlier in the Route Evaluation Process[©]. The questions generally fall into the five following categories:

- Identification of legal easements, right-of-ways, and other issues related to permitted commercial access or real-estate title and private property (e.g. vested, prescriptive rights);
- Identification of known or potential influences to specially-protected resources, e.g. listed T&E species or their critical habitat, historic sites (cultural resources eligible for or listed on the National Register of Historic Places) , Monument objects (identified as objects in Monument Proclamations), other sensitive resources, and known visitor conflicts, etc.
- Identification of ways in which to avoid, minimize or mitigate impacts, as well as identification of influences to other sensitive resources such as special management areas, soils values protected by Monument proclamation and identification of cumulative effects, etc.
- Identification of the public uses of a route, including recreational qualities, safety concerns, etc.
- Identification of route redundancy.

Underlying each specific standardized question in the Evaluation Tree[©] are a series of other related questions or concerns that should be addressed as the route is evaluated for its potential designation (refer to Attachment 2: Underlying Evaluation Tree Questions[©]). The manner in which the questions are answered leads the route evaluation team down any number of a series of “limbs” or pathways in the Evaluation Tree[©], depending upon how each of the sequential questions are answered. The specific questions are discussed in the following paragraphs.

Once the route characteristics are identified, the first question asked of the evaluation team is whether the route is an officially-recognized right-of-way or an officially-recognized County or State route. If the answer to this question is yes, the evaluation team is asked for more detail, such as identification of the right-of-way holder or whether the responsible agency has any plans for the route that may affect the evaluation and potential designation (e.g. route or access point re-alignment).

If the route is not a right-of-way or County or State route, the next question seeks to identify commercial, private property or administrative uses, regional influences (e.g. route serves more than one planning sub-region or serves as a principal means of connectivity within a sub-region), or whether the route is recognized as part of a federal planning document and subject to maintenance. The evaluation team may need to take a “hard look” pause to consider the implications of the potential designation on this route as routes that fall under this category may have specific legal requirements for access that may preclude closing the route without the approval or the right-of-way holder.

Resuming the path through the Evaluation Tree[©], if either of the above two questions are answered in the affirmative, the specific access needs are identified by recording the commercial, private property, or administrative uses of the route, and the regional access and/or the federal planning document are also identified. Commercial uses may include such uses as ranching, airstrips, or utilities, and the specifics under each of those categories is identified (e.g. for ranching the uses identified may include such facilities as corrals, water tanks, or ranch headquarters). Administrative uses include access needs from any governmental agency (including the military and state agencies), such as accessing weather stations, monitoring sites, or military training facilities. Regional uses, such as serving as a principal means of connectivity, are identified and the potential local influences afforded by the route are identified (i.e., does the route contribute to the local economy through tourism). Additionally, if the route is recognized as part of a federal planning document and subject to maintenance, there may be specific guidance regarding maintenance activities identified during the evaluation and potential designation process.

Route use and access can also be identified as being “primary”, “secondary” or “tertiary” during this process. Primary access indicates that the route serves as the main access point for a specific use. A secondary access indicates that the route may be utilized as an access point, however it is not the most commonly used route to gain access. For example, it could be the route is utilized as an access route only during specific weather conditions if the primary route is subject to flooding. Tertiary access indicates that the route may be utilized as an access route, however it is much less commonly used as such.

Once the access issues are identified, the pathway through the Evaluation Tree[©] leads to the identification of possible resource influences. The resource implications are addressed by asking: Might the continued use of this route impact State or Federal special status species or their habitat or cultural or any other specially-protected resources or objects identified by Agency planning documents, plan amendments or any other special area designations (e.g. National Monuments)? If this question is answered in the affirmative, the specific potential impacts are then identified. Data collected under this question may address cultural sites/polygons, special designation areas (e.g. Areas of Critical Environmental Concern (ACECs), Wilderness/Wilderness Study Areas), plants and animals (e.g. those listed under the Endangered Species Act, Management Indicator

Species), monument objects, and other items identified by the agency during the issue identification steps of the Route Evaluation Process[©].

The impacts to these resources can be identified as “direct” or “indirect” impacts. For example, a “direct” impact to a species may be harassment of the animal through the use of the route, while an “indirect” impact might include degrading the plants upon which an animal feeds and thus reducing the foraging area of the species.

If any of the identified impacts are in violation of statutes governing the protection of the resource (e.g. Endangered Species Act, Historic Preservation Act), the evaluation team takes a “hard look” pause to further consider the route’s potential designation based upon the influences to the resource. Consideration is given to whether the impact can be avoided, minimized or mitigated without closing the route, and if so, what steps will need to be taken (e.g. seasonal closure, vehicle type limitations, speed limits, species-specific mitigation measures). If the impacts cannot be avoided, minimized or mitigate without closing the route, the evaluation team identifies that issue. In either case, the evaluation of the route is continued to gather additional data that may be utilized for analysis of the larger planning area (e.g. landscape perspective, collective implications).

Even if the identified impacts are not in violation of statutes governing the protection of the resource, the next question in the pathway of the Evaluation Tree[©] asks whether the identified impacts can be avoided, minimized or mitigated. The evaluation team considers the impacts and potential means of addressing those impacts and continues along the pathway of the Evaluation Tree[©]. The specific measures that may be utilized to address the impacts are identified during the potential designation step of the Route Evaluation Process[©] and this process is discussed in Step 18 below.

Alternatively, if the resource impacts question was answered in the negative, the next question asks whether route closure or some other form of mitigation would address collective effects on various other resources not specifically identified as sensitive or specially protected (e.g. monument values, habitat fragmentation, sensitive soils). Once again, the route evaluation team considers other influences from the route and potential means of addressing those influences and continues along pathway of the Evaluation Tree[©]. The specific measures that may be utilized to address the influences are identified during the potential designation step of the Route Evaluation Process[©] and this process is discussed in Step 18 below.

The next question in the Evaluation Tree[©] gathers information about other uses of the route by asking whether the route contributes to public uses, such as recreational opportunities, potential designated trails and travel management system connectivity, public safety, or other public multi-use access opportunities enumerated in agency Organic laws. If the question pertaining to public uses is answered in the affirmative, the

specific public uses are identified (e.g. hiking, hunting, ATV use, equestrian use). These public uses may also be identified as being “primary”, “secondary” or “tertiary” similarly to the access needs.

For some routes, the pathway through the Evaluation Tree[©] may finish here. However, other routes may have one more question asked to identify possibly route redundancy. The evaluation team is asked whether the uses identified can be met by another route or routes that would minimize the resources impacts or the collective effects. This question once again prompts the evaluation team to consider the route not as a stand-alone route, but also to consider the route in correlation with the area surrounding it, both the immediate area and the larger planning area. If this question is answered in the affirmative, the specifics regarding the other route(s) is provided. However, if the question is answered in the negative, the uses that cannot be met by another route are provided. This question finishes the pathway of questions through the Evaluation Tree[©].

Once all the questions along the specific pathway of the Evaluation Tree[©] have been asked and answered, and the details about each answer collected if necessary, the evaluation team is directed to a specific “rosette” or cluster of possible designations in the Evaluation Tree[©] for the route based upon the information gathered through the evaluation process. See Step 18 for a discussion of the rosette and the next step in the process.

The questions within the Evaluation Tree[©] are systematically asked of each route as a means of collecting the specific information for the route. It also provides documentation for the specific evaluation process leading to the potential designation. As the evaluation team progresses through the Evaluation Tree[©], the responses to each question are recorded without assigning any weighting to the question responses. When the evaluation team is presented with the potential designations after responding to the questions in the Evaluation Tree[©], each potential designated trails and travel management system option as represented by agency staff may review the responses and then weight each answer according to their underlying objectives (see Step 18) which may be based upon route type, condition, natural or cultural resources, environmental concerns, public uses, and/or previous planning process findings. Additionally, the collective effects of the route’s influences, uses and potential designations must be considered as part of the evaluation step as they pertain to natural and cultural resources and recreational opportunities. Each potential designated trails and travel management system option may have distinctive management intent or a “game plan” for each sub-subregion that meets the overall objectives of the potential designated trails and travel management system option and therefore, the individual routes within an area will be evaluated and considered individually, but they will also be considered within the context of a larger landscape perspective.

Routes are evaluated based upon the best available knowledge contained in the GIS coverages, the knowledge of the agency staff (including previous planning efforts that may affect the route or area), information provided to the agency from the public, and/or other possible means of obtaining the data (e.g. other local, state and federal resource agencies). If certain information is not available or not available to a sufficient level of detail, notations within the database may be added indicating that additional information is necessary and the route will be re-evaluated after that information has been obtained or confirmed. Additionally, categories within the Evaluation Tree[©] may be added indicating a “suspected” or “potential” use or influence if the information is not known specifically. Agency staff may then follow up with the appropriate specialists or database to obtain the necessary data and re-evaluate the route to include this information. Additionally, as the public will have opportunity to further review route evaluation data and the potential route designations during both informal and formal comment periods, information previously unknown to the agency may be discovered at that time, allowing for re-evaluation of the route, and changes to the potential designation incorporated as necessary.

Each question along a pathway within the Evaluation Tree[©] serves as a means of gathering resource specialists’ responses and is asked of every route; no pathway is stopped prematurely based upon an answer to any question. This assists the evaluation team in considering combined or collective effects and provides them with a more thorough understanding of issues and uses pertaining not only to the individual route, but also to the sub-subregion, subregion and planning area as a whole. The evaluation team will then be better suited to take into consideration the “landscape perspective” as each route is considered, with a more thorough understanding of the flora and fauna, as well as the commercial, administrative or public uses of the area. This full pathway for each route is the key to a systematic and logical approach, verifying that the same questions are asked of each route and that the same type of information is gathered for each route.

A very important caveat regarding the use of the Evaluation Tree[©] that cannot be overlooked is that this is *only a tool* that creates a systematic logical repeatable framework for the collection of data utilized for the evaluation of each route. The confidence that one places in its recommendations is only at its highest when the evaluation team has spent adequate time in carrying out all of the steps described above as the Route Evaluation Process[©] (i.e. knowledge of the guiding statutes, public and agency issues and concerns, environmental constraints and commercial/recreational needs and uses), before utilizing the Evaluation Tree[©].

Development of Potential Designated Trails and Travel Management System options (Steps 18 through 21)

Step 18	Recommend and record potential designation code for each route under each potential designated trails and travel management system option as well as special notes regarding e.g., potential impacts, proposed mitigation, etc.
Step 19	Integrate Access and GIS databases to create maps for each potential designated trails and travel management system option showing recommended potential routes
Step 20	Input on range of potential designated trails and travel management system options regarding preferences (e.g., input from staff, management, cooperating agencies, and/or public)
Step 21	Development of preferred potential designated trails and travel management system option as part of range of potential designated trails and travel management system options

Step 18: As the last question in each pathway is answered the evaluation team is provided with a rosette or cluster of the potential designation(s) such as Open, Close, Limit, Mitigate Open or Mitigate Limit. Each of these answers is alphanumerically coded (i.e., “Close 08” or “Open 07”) such that the exact sequence of questions, as well as how they were answered, can be re-created in the future. These codes and all data collected throughout the Evaluation Tree[©] are entered into a database for future use and analysis.

In Steps 15 and 16 above, the plan alternatives were reviewed and the potential designated trails and travel management system travel management objectives for each alternative were fine tuned. Additionally the evaluation questions were fine tuned to insure that identified resource and use issues were adequately addressed. The Evaluation Tree does not set the threshold for acceptable impacts for each of the alternatives. These are instead typically established by agency staff as part of the NEPA process. Each potential designated trails and travel management system option considers the influences and uses identified through the Evaluation Tree and makes a potential designation based upon the sideboards for the alternative guiding that route network option. After completing step 17 for a route, each potential designated trails and travel management system option identifies the potential designation that best meets its objectives for that route and landscape as a whole. By reviewing the uses, resources and issues for each route, the potential designated trails and travel management system option may choose to weight certain concerns higher than others and potentially designate the route according to that weighting. The potential designation code for each potential designated trails and travel management system option is entered into the database for future use and analysis, including linkage with GIS (see Step 19). As each route is evaluated and a potential designation is made, an electronic record specific to that route is established (See Attachment 2: Route Evaluation Report[©]). The information collected includes:

- The route number;
- UTM coordinates indicating the approximate location of the route;
- The responses to each question of the Evaluation Tree[©] and, if applicable, the options selected for each question;

- The Evaluation Tree[©] code denoting potential designation, which as mentioned above would indicate the “leg” or “branch” of the Evaluation Tree[©] that was followed in arriving at the potential decision;
- The potential decision of Open, Close, Limit, Mitigate Open or Mitigate Limit for each potential designated trails and travel management system option.

Mitigation measures may be suggested during this stage to assist with implementation of the planning documents. Details regarding potential mitigation actions (e.g., actions to be performed, schedules for actions) are discussed by the agency in the subsequent planning documentation. The Evaluation Tree[©] is a tool to assist with route evaluation and potential designation and does not take the place of any required NEPA analysis.

Step 19: The electronic records are recorded in a database that allows the potential designations to be collectively integrated or joined with the existing route inventory GIS database. This “joining” of the two databases then allows for the production of maps that integrate recommended decisions with the route inventory.

Step 20: After the Route Evaluation Reports[©] are generated and the databases are linked, further input may be received from staff, management, cooperating agencies and/or the public. Whether at this stage or earlier in the evaluation process additional planning tools (e.g. VRM, ROS) may be utilized to add further analysis or assistance to this process. After reviewing the Route Evaluation Reports[©], comments may be recorded on the Staff Evaluation of Preliminary Travel Management Route Designation form (see Attachment 4: Staff Evaluation of Preliminary Travel Management Route Designation Form). Agency staff can then review the feedback, update the routes within the database as may be necessary based upon the new information received during the feedback process and create new Route Evaluation Reports[©] and maps.

Step 21: Once the additional input has been reviewed and the potential route designations for each potential designated trails and travel management system option are complete, the Potential Preferred Designated Route Network is developed using the Evaluation Tree[©] data and the potential designations analyzed as required under NEPA. The Preferred Alternative may determine that certain specific information about the routes be weighted more than other considerations, and analysis regarding that determination would be detailed in the NEPA documentation.

As useful as the Evaluation Tree[©] may be as a tool to systematically evaluate and make potential route designations, there may be circumstances which compel a manager to over-ride the recommendation of the Evaluation Tree[©]. This circumstance was anticipated and may be addressed within the NEPA document by providing a “statement of overriding considerations.”

NEPA Documentation (Steps 22 through 25)

Step 22	Develop and Incorporate Route Evaluation recommendations into the appropriate NEPA document
Step 23	Public Comment and Review of Potential Designated Transportation Network
Step 24	Final Environment Impact Statement (FEIS)
Step 25	Record of Decision (ROD)

Step 22: Integrating the Route Evaluation Process[©] as a tool with the agency's NEPA requirements and the specific guidelines delineated in agency planning handbooks is an integral component of this process. Travel management planning and the potential route designation create outcomes that are viewed by many professional land management planners as central to the understanding and effective analysis of impacts in any major land use plan and EIS. Simply put, most impacts over which management has control within a management area are related to visitor use trend and patterns (i.e. where they go, how many, how they go, when they go, etc.) Because of this very important and inseparable interrelationship, travel management planning (including potential route designation) should, to the extent possible, be fully integrated and addressed early in the land use planning process. Due to this relationship, the data collected and the recommendations made through the Evaluation Tree[©] provide a strong base of information for required NEPA analysis in the DEIS, but it does not provide the necessary NEPA analysis on its own.

Step 23: After circulating the DEIS, the public will have the opportunity to review and comment on the proposed route evaluations and potential designations as part of the DEIS. In order to facilitate the ease with which the public can review the information utilized to evaluate the routes, individual route reports are available on a CD in the back of each DEIS. A copy of this CD may be requested from the Arizona Strip District Office at 345 East Riverside Drive, St. George, UT 84790 or by calling (435) 688-3266 or by email to Arizona_Strip@blm.gov. Written comments are submitted to the agency for their review, classification, and incorporation into the FEIS, as needed. Appropriate changes to the potential route designations are then made. At this near final stage, as well as throughout the earlier steps (i.e. steps 1 - 8, 15 - 21, with particularly emphasis on steps 17 - 18) as the potential designated trails and travel management systems are developed, maintenance, law enforcement (e.g. compliance) and budget considerations need to be carefully evaluated for their feasibility and practicality by maintenance, law enforcement and management staff.

Steps 24 and 25: Once the comments have been reviewed by the agency, the FEIS is issued containing any responses to comments and modifications to the text of the DEIS, if necessary. The Record of Decision is the final approval of the FEIS by the agency designating officer.

Public Input and Comment (at various points during Steps 1 through 25)

At various points during the Route Evaluation Process[©], the public has the opportunity to provide input or comment on the route evaluations, depending upon the individual agency and the purpose for which they are utilizing the Route Evaluation Process[©].

This public involvement may be accomplished in any of the following ways:

- assistance with inventory of the routes to be evaluated and potentially designated;
- submit information to agency staff regarding the use and/or resources for routes, potential designated trails and travel management systems or areas;
- submit information to agency staff regarding specific resources to be considered for avoidance, mitigation, or protection while evaluating the routes
- public meetings to discuss the process;
- informal meetings with agency staff;
- review of maps and Route Evaluation Reports[©] at agency offices and/or other locations; or
- submit written comments as part of a formal NEPA comment period.

Incorporation of Additional Information / Addressing New Conditions:

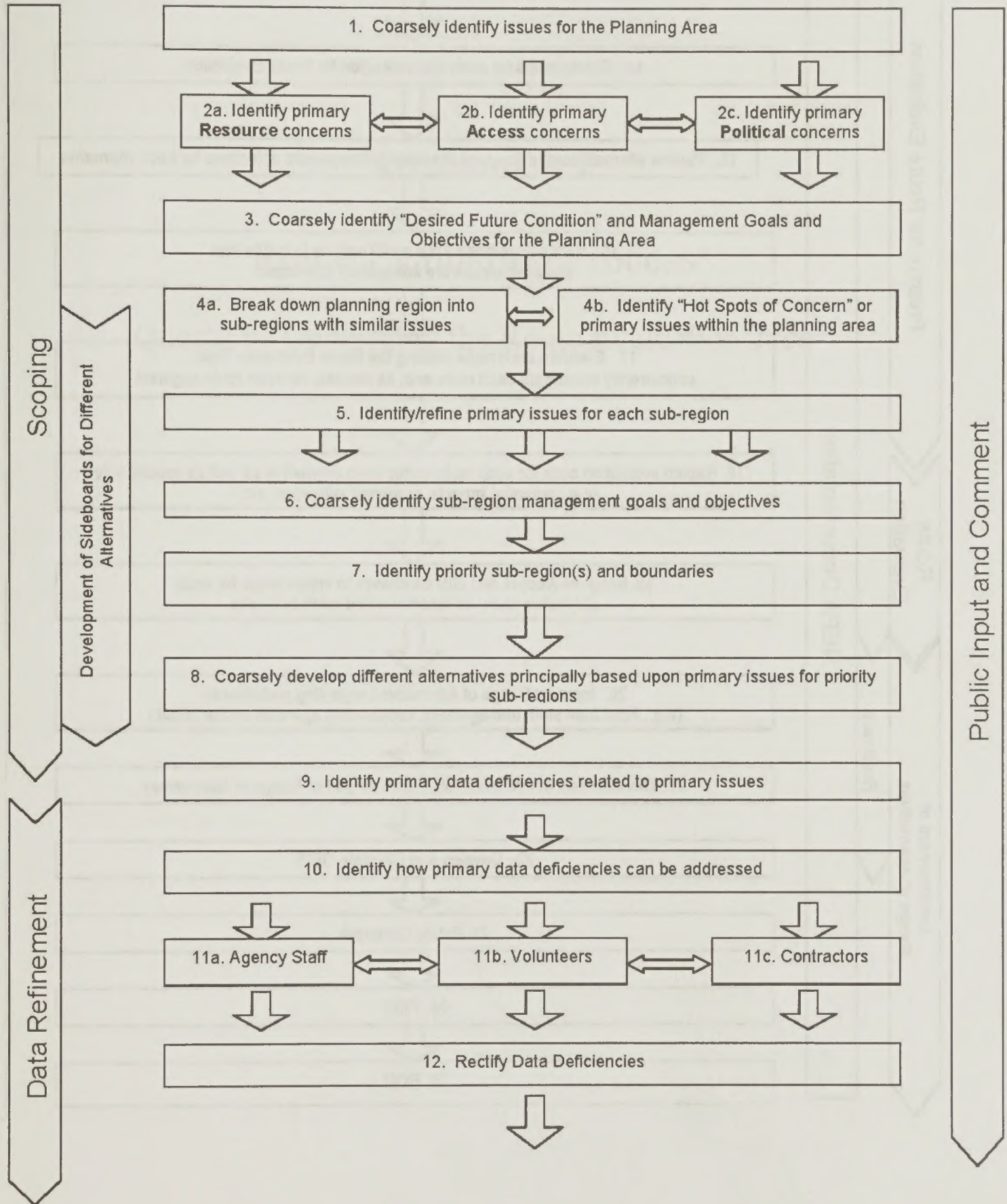
During the life of the plan it can be expected that new information or changing conditions will result in the need to reassess both individual routes and possibly the entire route system. Examples of such changes that might result in such a reevaluation might include: proposals for new routes or route closures, as well as changing recreational trends, shifts in commercial activities, discovery of previously unknown cultural sites and newly listed species. The Route Evaluation Tree Process has been designed to address the need for updating via its software database (developed in Access) which allows for the easy incorporation and analysis of new information which can then be used via GIS software interface to modify the potential designation of routes as necessary (i.e. in accordance with NEPA and other pertinent statutes). Once potential route designations have been appropriately modified, those potential route designation changes can be quickly shared with appropriate parties (including the public) via the production of route reports that display the information that was considered as part of each route evaluation, as well as visually via the production of detailed GIS maps.

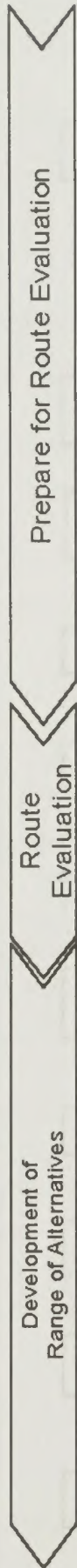
List of Attachments

Attachment 1	Route Evaluation Tree Process[©] for Travel Management Planning
Attachment 2	Underlying Evaluation Tree Questions[©]
Attachment 3	Route Evaluation Report[©]
Attachment 4	Staff Evaluation of Preliminary Travel Management Route Designation

Attachment 1

Route Evaluation Process[©] for Travel Management Planning



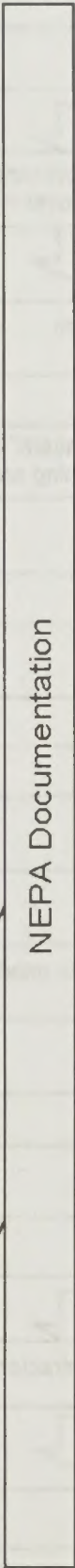


Prepare for Route Evaluation

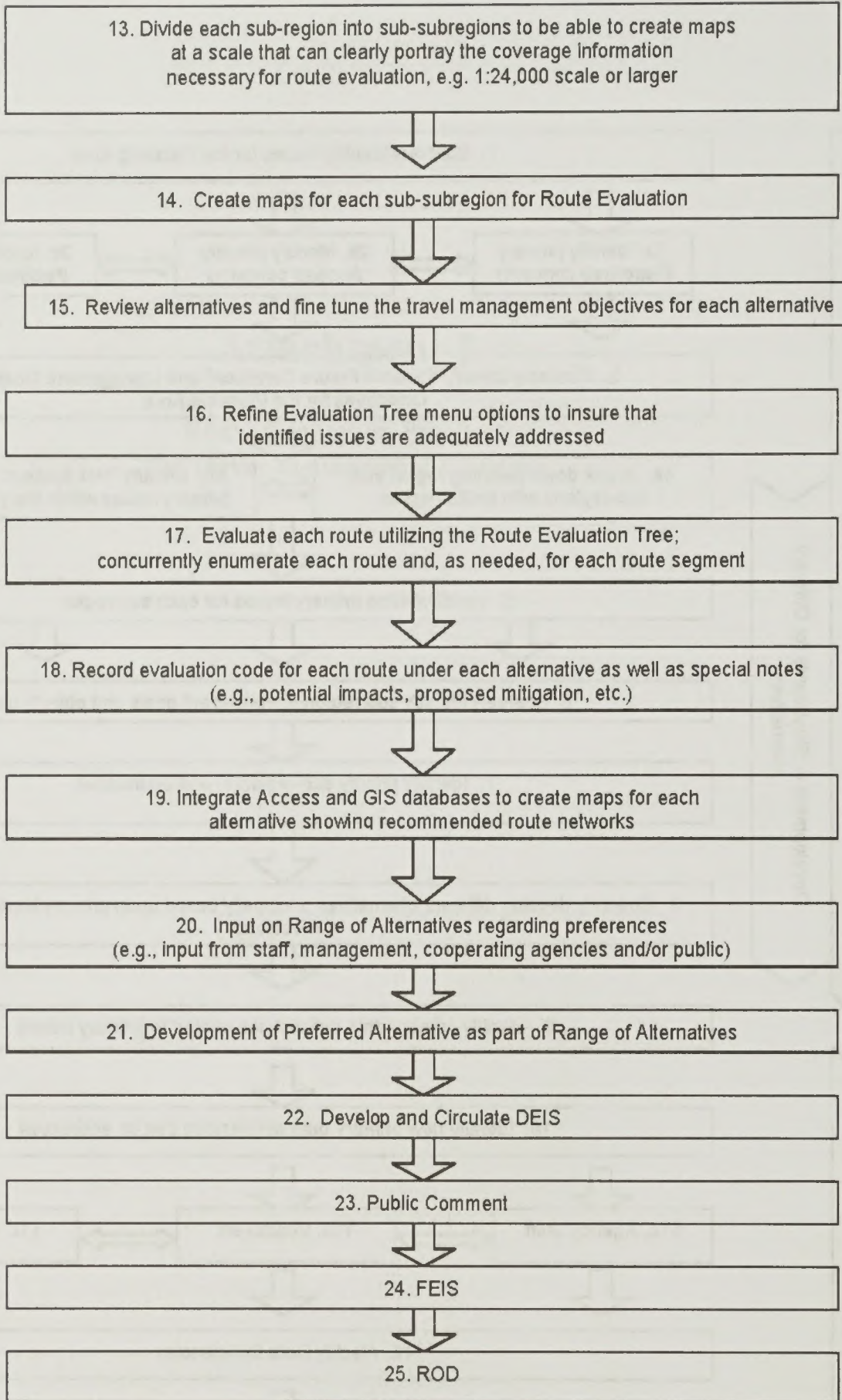
Route Evaluation

Development of Range of Alternatives

Software



NEPA Documentation



13. Divide each sub-region into sub-subregions to be able to create maps at a scale that can clearly portray the coverage information necessary for route evaluation, e.g. 1:24,000 scale or larger

14. Create maps for each sub-subregion for Route Evaluation

15. Review alternatives and fine tune the travel management objectives for each alternative

16. Refine Evaluation Tree menu options to insure that identified issues are adequately addressed

17. Evaluate each route utilizing the Route Evaluation Tree; concurrently enumerate each route and, as needed, for each route segment

18. Record evaluation code for each route under each alternative as well as special notes (e.g., potential impacts, proposed mitigation, etc.)

19. Integrate Access and GIS databases to create maps for each alternative showing recommended route networks

20. Input on Range of Alternatives regarding preferences (e.g., input from staff, management, cooperating agencies and/or public)

21. Development of Preferred Alternative as part of Range of Alternatives

22. Develop and Circulate DEIS

23. Public Comment

24. FEIS

25. ROD

Public Input and Comment

Attachment 2

Route Evaluation Process[©]

Questions Underlying the Route Evaluation Tree[©]

Route Evaluation Process[©]

Step 17 – The Evaluation Tree[©]

Questions Underlying the Route Evaluation Tree[©]

Route evaluation and designation accomplished via the Route Evaluation Process[©] developed by Advanced Resource Solutions, Inc. utilize the Route Evaluation Tree[©] (Evaluation Tree[©]) and associated software. The Evaluation Tree[©] and the drop-down menus in the software are fine tuned as necessary to meet specific planning issues and may be supplemented as appropriate with more specific, issue-oriented questions that underlie the major questions found in the Evaluation Tree[©].

These underlying questions are organized by the following ‘major question’ categories:

- Commercial, Private, and Administrative Access Issues;
- Environmental Issues / Special Resources;
- Recreation and Other Public Access Issues; and
- Route Redundancy Issues

The list below is representative of the underlying questions asked during route evaluation. The list is not all-inclusive as each planning area has issues that are specific to that area. The questions may be asked during the route evaluation sessions to further assist with answering the questions found in the Evaluation Tree[©].

Definitions provided as part of these underlying questions are provided as general guidance only and would be modified to match the definitions intended by each agency.

Commercial, Private, Administrative Access Issues

Evaluation Tree[©] A:

“Is the route an officially recognized Right-of-Way or an officially- recognized County or State route?”

Consider the following:

1. Is the route part of an officially-recognized Right-of-Way? (e.g. part of a utility corridor, serves as access to maintain a commercial site or area)
2. Is the route maintained and legally recognized by another agency of government (tribal, state, county, NPS, Forest Service, etc.) and recognized as an integral part of a larger regional or sub-regional route network (“trunk line”)?

Assess and/or take into account:

- a) Are there any special or future plans that the responsible agency has for the route that may affect this evaluation?
- b) Are there easement acquisition needs for the route?
- c) Should the route remain open or should its use be limited in some manner? (e.g., seasonally, by vehicle type, etc)

Evaluation Tree[©] C:

- *Does the route provide commercial or private property access (e.g. via prescriptive or vested rights)*
- *Is the route a regional route that serves more than one planning sub-region;*
- *Is the route a principal means of connectivity within a sub-region; or*
- *Is the route officially recognized as part of a Federal planning document and is subject to maintenance?*

Consider the following:

1. Is the route on an existing official agency transportation system?
2. Does the route provide access to a governmental, commercial, industrial, or other non-recreational facility, right-of-way, structure, or to private or non-agency property?
3. Is the route necessary for access to non-federal lands (e.g. private property)?
4. Does the route provide administrative access (e.g. fire management, monitoring sites, etc.)?
5. Does the route provide for the maintenance of facilities necessary for officially permitted commercial activities (e.g. ranching, mining)?
6. Does the route meet the specific definition for a route for evaluation as defined by the agency?
7. Does the route provide continuity between state or county (public) roadway and other agency (e.g. BLM, USFS, NPS, military) routes?
8. Does the route support important access to other lands under the jurisdiction of other agencies (e.g. Recreation Areas)?

Assess and take into account:

- a) Does adequate access for commercial, private, or administrative purposes in the route area already exist? If so, does the route represent secondary access?
- b) Are multiple access routes needed for commercial or private lands?
- c) Should the route be limited to commercial, private, or administrative access only?
- d) Is there a history of use for the route? Is the route considered an R.S. 2477 route? Has that assertion been perfected?
- e) Is a commercial permittee (e.g. rancher, miner) required to maintain the route under the conditions of the permit; or does the permittee voluntarily maintain the route for operational or permit purposes?

Environmental Issues / Special Resources

Evaluation Tree[©] B, F, G:

“Might the continued use of this route impact State or Federal special status species or their habitat or cultural or any other specially-protected resources or objects identified by Agency planning documents, plan amendments or any other special area designations (e.g. National Monuments)?”

Consider the following:

1. Might the continued use of route cause unauthorized appropriation, injury, destruction, or removal of any scientific and historic objects of interest in National Monuments?
2. Will the route contribute to or detract from furthering Monument protection and protection of Monument objects?
3. Does the route degrade wilderness values or the roadless character so as to disqualify an area from further consideration as a Wilderness Study Areas?*
4. Does the route (through its actual roadway as well as zone of influence) provide access to and/or pass through, cross over, intersect, or otherwise affect:
 - a) special status species' habitats?
 - b) cultural, historic, archeological, Tradition Cultural Properties, sites or areas?
 - c) any legally or administratively designated or proposed sites or areas (National Monuments, Wilderness (existing, WSAs), ACECs, Research Natural Areas, Critical Habitats, etc.)?

Assess and take into account:

- a) Emphasize closure or the minimization of the use of routes through the habitat of any special status species when closure would likely result in benefits to the species.
- b) If the route negatively impact any endangered species, archeological site or geologic feature and if so, can the impact be mitigated (e.g. through road maintenance, re-routing or gating)?

Evaluation Tree[©] E, I, K:

“Would route closure or some other form of mitigation address cumulative effects on various other resources not specifically identified above as sensitive or specially protected?”

Consider the following:

1. Does the route, when combined with other routes, resources, uses, or landscape features, pose any indirect or cumulative effects (such as habitat fragmentation) or contribute in a positive or negative way (such as redundancy for back-up access for emergency or public safety purposes) at a different scale?
2. Will the route contribute to or detract from furthering Monument protection and protection of Monument values?

3. Does the route (through its actual roadway) provide access to and/or pass through, cross over, intersect, or otherwise affect:
 - a) other biologically or ecologically important areas (“hot spots”), wildlife migration routes or movement/dispersal corridors, critical winter range, etc.?
 - b) geologically important or unique sites or areas (including petroleum, gravel, flagstone, and other mineral resource deposits) or where energy development (including geothermal, wind, etc.) could occur outside of wilderness areas and National Monuments?
 - c) floodplains, wetlands, ephemeral or perennial creeks, streams, springs, seeps, or other natural water sources or bodies?
 - d) areas, sites, structures, or projects of scientific and/or management interest (livestock or wildlife fencing; water collection or transfer facilities, storage tanks, and drinkers; corrals; rangeland vegetation exclosures; weather gauges; etc.)? (Is there an opportunity to limit this route to Administrative or Commercial Use only?)
 - e) areas or sites of past, present, or foreseeable future: native species, natural habitat, range improvement, or other resource restoration/reintroduction projects; fuels management or vegetative treatment projects; and/or invasive species/noxious weed colonization or expansion control projects?
 - f) cryptobiotic, highly erodible, or other sensitive or important soils?
 - g) dry or wet meadows?
 - h) areas or sites important for another reason?
4. Will closure of this route contribute cumulatively to concentrating human use to fewer access routes, possibly to the benefit or in some cases even to the detriment of certain sensitive resources?
5. Assess and take into account:
 - a) Avoid permanent closure of any route that is the sole access to any source of water for wildlife that requires regular maintenance. (Is there an opportunity to limit this route to Administrative Use only?)
 - b) If the route were to be designated as closed, is it feasible, given local conditions, to physically close the route in such a way as to ensure permanent closure through public compliance?
 - c) Does the route support forest or ecosystem restoration activities?

Evaluation Tree[®] D, H, J:

“Can the impacts to the above sensitive resources be avoided, minimized or mitigated?”

Consider the following:

1. In addition to completely closing and restoring the route, are there other means by which to avoid, minimize or mitigate the potential impacts identified above?
Consider limits on use (e.g. season of use or sensitivity, group size, vehicle type, type of activity, etc.) and/or consider various other forms of mitigation (e.g. re-routes,

adaptive management monitoring with identified thresholds of acceptable change and specific response measures.

2. Does the route, when combined with other routes, resources, uses, or landscape features, pose any indirect or cumulative effects (such as habitat fragmentation) or contribute in a positive or negative way (such as redundancy for back-up access for emergency or public safety purposes) at a different scale and how can these impacts be avoided, minimized or mitigated?
3. *Assess and take into account:*
 - a) Emphasize closure of routes through wildlife “hot spots” when doing so would likely result in significant benefits to the species or habitat.

Recreation and Other Public Access Issues

Evaluation Tree[©] L, M, N, O, P, Q, R, S, T, U, V, W:

“Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public multi-use access opportunities enumerated in agency Organic laws?”

Consider the following:

1. Does the route provide recreational opportunity?
2. Will use of the route contribute to or detract from the various expressions of the “public interest” in and for National Monument resources and values, such as scientific inquiry, long-term preservation and public use and enjoyment for present and future generations?
3. Does the route dead-end at a destination point such as a facility, existing or planned public interpretative site, structure, trail head, or camp site which will be left open or accessible?
4. Does the route (through its actual roadway as well as zone of influence) provide access to and/or pass through, cross over, intersect, or otherwise affect areas or sites of public recreational uses (e.g. camp or picnic sites, hiking trail heads, hunting areas, equestrian access, OHV uses, rock-hounding, wildlife watching, spelunking, rock-climbing, sightseeing, scenic vistas, or other recreational activities) which will be left open or accessible?
5. Is the route an important link between recognized recreation use areas or motorized/nonmotorized trails?
6. Does the route provide or potentially provide important sightseeing or driving-for-pleasure opportunities for one or more modes of motorized transportation?

7. Does the route provide or potentially provide important “user experience” opportunities for one or more modes of non-motorized transportation?
8. Does the route provide important access to present commercial outfitters and guides as part of their operations?
9. Is the route an important component in an existing OHV “play” area?
10. Does the route provide access to scenic qualities?
11. Does the route provide a different recreation opportunity, either activity- or setting-related, from opportunities on potentially redundant routes?

Assess and take into account:

- a) Would closing this route pose any serious constraints in terms of cost, physical practicality, and/or enforcement?
- b) Would allowing this route to remain open pose any serious constraints in terms of cost, physical practicality, and/or enforcement?
- c) Does the designation recommendation for this route raise any issues, concerns, impacts, or conflicts not addressed under one or more of the other questions?
- d) Is the route important for maintaining “dispersed” recreation use or would its closure contribute to “concentrating” use?
- e) Are non-motorized types of recreation uses impacted by the presence of routes and vehicles?
- f) Are there one or more alternative routes available to serve the users of the route?
- g) Does the route duplicate another route in destination and function?
- h) Is the route user-created or the result of administrative process?

Route Redundancy Issues

Evaluation Tree[©] X, Z, BB, DD, FF, HH:

“Can the commercial, private-property or public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources??”

Evaluation Tree[©] Y, AA, CC, EE, GG, II:

“Can the commercial or private-property uses of this route be adequately met by another route that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?”

Evaluation Tree[©] JJ, KK, LL:

“Can the public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?”

Consider the following:

1. Are there one or more alternative routes available to serve the users of the route?
2. Would the uses of this route generally be regarded as redundant by both the recreating public as well as by commercial or private interests?
3. Might another route adequately meet this route’s uses (i.e. both recreational and commercial) in a less environmentally damaging manner?

Assess and take into account:

- a) Would the existence of the route lead to proliferation of additional roads or off-route use?
- b) Is the route within an area with evidence of soils erosion from proliferation of parallel routes or routes to the same destination?
- c) Does the route contribute to habitat degradation from the proliferation of routes in the area?
- d) Is the route user-created or the result of administrative process?

Attachment 3

Route Evaluation Report©

Alternative 1	Alternative 2	Alternative 3	Alternative 4
Alternative 5	Alternative 6	Alternative 7	Alternative 8
Alternative 9	Alternative 10	Alternative 11	Alternative 12
Alternative 13	Alternative 14	Alternative 15	Alternative 16

Route Evaluation Report

- 1. REGION: Arizona Strip
- 2. PLANNING AREA SUBREGION: Parashant Mohave Coconino Vermilion

3. ROUTE IDENTIFICATION:

Sub-subregion: Littlefield
 Planning Route ID: M1
 Route Start UTM: North: _____ East: _____

- 4. ROUTE TYPE: (Principal Feeder/Trunk) (Other)

5. POTENTIAL DESIGNATION BY ALTERNATIVE:

Alternative	Alt A	Alt B	Alt C	Alt D
Recommended Designation				
Designation Code #				

6. IF Mitigation or Limited Designation recommended, explain in specific alternative:

Alt A	Alt B	Alt C	Alt D
_____	_____	_____	_____
_____	_____	_____	_____

7. Specific Comments/Special Circumstances:

Alt A	Alt B	Alt C	Alt D
_____	_____	_____	_____
_____	_____	_____	_____

(OVER)

8. DESIGNATION CRITERIA – 43 CFR 8342.1

- (a) Areas and trails shall be located to minimize damage to soil watershed, vegetation, air, or other resources of the public lands and to prevent impairment of wilderness suitability.
- (b) Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.
- (c) Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands and to ensure the compatibility of such uses with existing conditions in populated areas taking into account noise and other factors.
- (d) Areas and trails shall not be located in officially designated wilderness areas or primitive areas. Areas and trails shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect their natural esthetic scenic or other values for which such areas are established.

9. RECOMMENDED BY: _____ Date _____
 _____ Date _____

10. DECISION APPROVED BY: _____ Date _____
 Authorized Officer

Attachment 4

Staff Evaluation of Preliminary Travel Management Route Designation

Route ID	Route Name	Staff	Rating	Comments
1
2
3
4
5
6
7
8
9
10

State of Arizona BLM

Staff Evaluation of Preliminary Travel Management Route Designation

- 1. Planning Route ID: _____
- 2. Map Name: _____
- 3. Alternative (Circle all that apply): **A** **B** **C** **D**
- 4. Name of Person Commenting: _____ Phone: _____
- 5. Preliminary Designation Issue (Specify alternative(s) then explain why you disagree with the potential designation(s)):

- 6. Suggested Designation & Rationale (Specify Alternative(s)):
-
-
-
-

Management Response

- 7. Comment Accepted?: **Yes** **No**
 - 8. Rationale:
-
-
-

- 9. _____ Date _____
 Authorized Officer

APPENDIX 3.A

HISTORICAL GEOLOGY AND STRATIGRAPHY OF THE PLANNING AREA

HISTORICAL GEOLOGY AND STRATIGRAPHY OF THE PLANNING AREA

The lithologic descriptions of the geologic units exposed in the Planning Area described below are adapted from Billingsley, 2000; Billingsley and Workman, 2000; and Billingsley and Wellmeyer, 2003, unless otherwise referenced.

Precambrian

In the Planning Area, the Precambrian crystalline basement is unconformably overlain by Paleozoic through Cenozoic rocks. The Precambrian rocks are divided into two eras: the older Archeozoic and younger Proterozoic. Archeozoic rocks are primarily granite, granite gneiss, schist, diorite porphyry, and related crystalline intrusive rocks (Moore and et al., 1960; Wilson and Moore, 1959) and are not exposed in the Planning Area.

Early Proterozoic rocks are represented by the Vishnu Series, which is exposed in the Virgin Mountains. The Vishnu Series were created during the Mazatzal Revolution, between 1.3 billion and 1.5 billion years ago, by large plutonic intrusions metamorphosing the sedimentary and volcanic rocks into schist, quartzite and metavolcanics while the intrusions assumed a gneissic structure (Hayes, 1969).

Middle and Late Proterozoic rocks include the Grand Canyon Supergroup. The Grand Canyon Supergroup is not exposed in the Planning Area. However, it is, exposed in the bottom of the Grand Canyon, where it comprises as much as 12,000 feet of sediment (Hayes, 1969). The Grand Canyon Supergroup has been divided into the Unkar and Chuar groups (Walcott, 1883, 1895). Rocks of both groups consist dominantly of clastic sedimentary rocks with minor amounts of limestone and basaltic lavas (Hayes, 1969). According to Shride (1967), these rocks were deposited in shallow marine waters and near shore terrestrial environments. As the Proterozoic came to an end a period of structural deformation occurred, referred to as the Grand Canyon Disturbance. It was at the end of this period that diabasic intrusive activity occurred in the sedimentary strata (Wilson, 1962).

Cambrian

After a long period of erosional time known as the Great Unconformity, Cambrian seas covered the Planning Area from the north and deposited large quantities of sediments, represented by the Tonto Group, in a geosynclinal environment that today corresponds to the Virgin-Beaver Dam Mountains area. The Tonto Group, in ascending order, are Tapeats Sandstone, Bright Angel Shale, and Muav Limestone.

The Tapeats Sandstone is a brown and red-brown, cliff-forming sandstone and conglomerate. The Bright Angel Shale consists of green and purplish, slope-forming siltstone and shale and red-brown sandstone. It includes an interbedded limestone in the upper part. The Muav Limestone is a gray, brown, and orangish, cliff-forming limestone, dolomite, and interbedded

thin calcareous mudstone. These units have intertonguing relationships and conformable contacts. The Tonto Group thickens to the north across the Wasatch Hingeline to a thickness of approximately 2,200 feet in the Virgin Mountains (Wilson, 1962). This geosynclinal environment persisted throughout most of the Paleozoic era with repeated transgressions and regressions of the seas.

Ordovician and Silurian

In the Planning Area, a hiatus of approximately 100 million years is present which represents a period of erosion or non-deposition that occurred during part of the Late Cambrian, all of the Ordovician and Silurian, and most of the Early and Middle Devonian.

Devonian

During the Middle and Late Devonian, the Planning Area and most of Arizona was flooded by epicontinental seas. Devonian rocks represent the first in a series of marine transgressions following uplift and erosion of Cambrian sediments. Devonian rocks in the Planning Area are represented Temple Butte Formation. By the end of the Devonian the entire state of Arizona was uplifted above sea level and eroded.

The Temple Butte Formation consists of locally fossiliferous, purplish, and gray, ledge-forming dolomite, sandy dolomite, sandstone, mudstone, and limestone, along with purplish, and gray, fine- to coarse-grained, thin- to medium-bedded, ledges of mudstone, sandstone, and dolomite. An unconformity is present at base of Temple Butte Formation and conglomerate fills channels eroded into the underlying Cambrian strata. In the Planning Area, the formation varies between approximately 50 feet from east to nearly 500 feet to the west.

Mississippian

By early to middle Mississippian time, Arizona was again submerged beneath shallow seas. In general, the Mississippian sea was clear and warm as evidenced by an abundance of fossils, and the lack of terrigenous sediments and evaporites (McKee and Gutschick, 1969).

The Mississippian is represented by the units of the Redwall Limestone. It includes four members as described by McKee (1963), they are in ascending order, the Whitmore Wash, Thunder Springs, Mooney Falls, and Horseshoe Mesa Members. Overall, the Redwall Limestone increases in thickness east to west across the Planning Area from about 600 to 800 feet. It is exposed in canyons in the southern portion of the Planning Area, the lower portions of the Grand Wash Cliffs and near the Virgin Mountains.

- The Whitmore Wash Member is grayish, cliff-forming, thick-bedded, fine-grained limestone and dolomite. It is locally fossiliferous and has an unconformable contact with the underlying Temple Butte Formation.

- The Thunder Springs Member consists of cliff-forming, fossiliferous, finely crystalline dolomite and fine- to coarse-grained limestone. The contact is disconformable and planar with the underlying Whitmore Wash Member.
- The Mooney Falls Member is a light-gray, cliff-forming, fine- to coarse-grained, thick- to very thick-bedded, fossiliferous limestone. It is highly karstified and has a disconformable contact with underlying Thunder Springs Member.
- The Horseshoe Mesa Member is light olive-gray, ledge- and cliff-forming, thin-bedded, fine-grained limestone. Fossils are not common except locally and it is highly karstified. The contact is gradational and disconformable with the underlying massive-bedded limestone of the Mooney Falls Member.

The recently discovered Surprise Canyon Formation has been mapped throughout the Grand Canyon and should occur in the Planning Area. It consists of very fossiliferous, dark reddish-brown cliff- and slope-forming siltstone and sandstone, gray limestone and dolomite, and white conglomerate in a dark-red or black sandstone matrix (Billingsley and Beus, 1999). The formation is present only as deposits in erosion channels and infillings of karst features dissolved from the unconformable contact with the Redwall Limestone. It is not mapped in the Planning Area, although it should occur discontinuously where the upper surface of the Redwall Limestone is exposed. The thickness is variable however, at the Grand Canyon the maximum thickness is about 400 feet and the unit thins eastward.

Pennsylvanian

Pennsylvanian rocks are composed of interbedded marine and continental limestones, sandstones and shales. These rocks were deposited during periods of transgression and regression, with each transgression being progressively more wide spread. Erosional processes are evident at the top of each successive unit. Near the Grand Canyon in the Planning Area, Pennsylvanian and lower Permian aged rocks are referred to as the Supai Group. To the north and west, Pennsylvanian aged rocks undergo a facies change from predominantly clastic sediments to carbonates represented by the Callville Formation and Pakoon Limestone. Thickening of the carbonate facies represents a geosynclinal environment, deepening to the north, which persisted from the Cambrian through the Pennsylvanian and into the Permian. These strata are exposed in canyons in the southern portion of the Planning Area, the Grand Wash Cliffs and near the Virgin Mountains.

The Callville Formation occurs in the Basin and Range, Virgin Mountains, and Virgin River canyon areas. The upper part includes rocks mapped as the Pakoon Limestone. The formation also includes rocks mapped as the Bird Spring Formation by Bohannon and others (1991). It is divided into a gypsiferous facies and limestone, cherty limestone, arenaceous limestone, and calcareous sandstone. The overall thickness of the Callville Limestone averages more than 1,000 feet and increases to more than 1,500 feet in the Beaver Dam Mountains (Dobbin, 1939). It has an unconformable contact with the Redwall Limestone or the Surprise Canyon Formation.

The Mississippian through Permian Supai Group, in ascending order, consists of the Watahomigi, Manakacha, Wescogame formations and the Esplanade Sandstone (grades into the Pakoon Limestone to the west). The Mississippian and Pennsylvanian Watahomigi and the Pennsylvanian Manakacha and Wescogame Formations comprise the lower Supai Group. The entire Supai Group becomes the Callville Formation west of the Grand Wash Cliffs.

- The Watahomigi Formation consists of a locally fossiliferous, gray and purplish-red, slope-forming limestone, siltstone, mudstone, and conglomerate. It forms an upper ledge and slope unit and a lower cliff unit. The formation has an unconformable contact with the Redwall Limestone or Surprise Canyon Formation and averages 100 feet thick in the east, thickening to 200 feet along the Grand Wash Cliffs.
- The Manakacha Formation consists of locally fossiliferous, light red, white, and gray sandstone, calcareous sandstone, dark-red siltstone, and gray limestone. The contact between the Manakacha and underlying Watahomigi Formations is unconformable and its average thickness in the Planning area is approximately 180 feet.
- The Wescogame Formation is locally fossiliferous and has an upper slope forming unit and a lower cliff forming unit. The formation is composed of interbedded reddish to gray, fine-grained siltstone, mudstone, and sandstone. It has an unconformable contact with the underlying Manakacha Formation and the thickness ranges from approximately 130 to 210 feet in the Planning Area.

Permian

Pennsylvanian rocks are overlain by the Lower Permian rocks, which in ascending order are, Esplanade Sandstone of the Supai Group, Queantoweap Sandstone, Hermit Shale, Coconino Sandstone, Toroweap Formation, and Kaibab Limestone. The fluvial Esplanade Sandstone is the thickest and most widespread formation in the Supai Group. This formation represents a high energy fluvial environment that grades into the marine Pakoon Limestone between the Hurricane Fault, and the Grand Wash Cliffs. Further west and to the north it becomes the upper member of the Callville Formation. This transition represents an east to west facies change across the Planning Area from continental and deltaic deposits to calcareous sandstone and marine limestone deposited in a geosynclinal basin (Nations and Stump, 1981).

The name Queantoweap Sandstone applies locally to the Virgin River canyon, Virgin Mountains, and Beaver Dam Mountains and represents both aeolian coastal dune and marine offshore environments. The sequence of Esplanade Sandstone, Hermit Shale, Coconino Sandstone, Toroweap Formation, and Kaibab Limestone represent a general trend of regressions and transgressions during the Permian. From the fluvial Esplanade Sandstone and fluvial/marine-shoreline Hermit Formation to the aeolian Coconino Sandstone, followed by development of a sabkha and fluctuations in water depth as the Toroweap Formation was deposited. Afterward a marine transgression occurred resulting in the formation of the Kaibab Limestone. The Kaibab

Limestone is widely exposed across the Planning Area and the older Permian Strata are exposed in canyons in the southern portion of the Planning Area, Hurricane Cliffs, Grand Wash Cliffs and near the Virgin Mountains.

The Esplanade Sandstone is a light-red and pinkish-gray, cliff-forming, fine- to medium-grained, medium-bedded, well-sorted, calcareous sandstone and interbedded, dark-red, slope forming siltstone. It undergoes a gradual facies change west of the Hurricane Fault to a light red and white, calcareous sandstone and grades into the marine Pakoon Limestone west of the Grand Wash Cliffs. The Pakoon Limestone beds are gray, fine- to medium-grained, thin- to medium-bedded limestone and oolitic limestone. The contact with underlying Wescogame Formation of the Supai Group is unconformable and marked by erosion channels. The overall thickness of the Esplanade Sandstone and Pakoon Limestone west of the Hurricane Fault, along the Grand Wash Cliffs is approximately 350 feet.

The Queantoweap Sandstone, present in the Virgin River canyon, Virgin Mountains, and Beaver Dam Mountains is a locally gypsiferous, tan and white, fine-grained to very fine-grained, medium- to thick-bedded, cross-stratified cliff- or ledge-forming sandstone. The contact is gradational between the underlying gypsiferous unit and the upper Callville Limestone. Its thickness is about 400 feet thick at Virgin River canyon.

The Hermit Formation consists of fluvial/marine-shoreline, reddish, slope-forming, fine-grained, thin-bedded siltstone, mudstone, and sandstone. It unconformably overlies Esplanade Sandstone and in the Planning Area is as much as 900 feet thick.

The Coconino Sandstone overlies the Hermit Formation and consists of tan to white, cliff-forming, fine-grained, well-sorted, cross-bedded quartz sandstone of aeolian origin. An unconformable contact with the Hermit Formation is sharp and planar and desiccation cracks in the Hermit are filled with tan sandstone. The Coconino Sandstone ranges between 150 and 200 feet thick in the Planning Area.

The Toroweap Formation overlies the Coconino Sandstone and is subdivided into three members, representing sediments deposited during regressive, transgressive, and regressive sequences, respectively. It includes, in ascending order, the Seligman Members, Brady Canyon and Woods Ranch Members, as defined by Sorauf and Billingsley (1991).

- The Seligman Member is a gray-white to yellowish-red, slope-forming, calcareous sandstone and gray dolomite, containing minor occurrences of white gypsum. It has a gradational contact with the interbedded Coconino and is about 60 feet thick in the Planning Area.

- The Brady Canyon Member consists of fossiliferous, light gray, cliff- and ledge-forming, fine- to coarse-grained, massive limestone containing reddish-orange chert nodules. Contact with the underlying Seligman Member is gradational and is about 150 feet thick in the Planning Area.
- The Woods Ranch Member is a gray and light-red, slope-forming gypsiferous siltstone and silty sandstone. It is interbedded with white laminated gypsum and gray thin-bedded limestone. Contact with underlying Brady Canyon Member is gradational and in the Planning Area the thickness can be as much as 200 feet, but varies widely owing to the solution of gypsum.

The Kaibab Formation overlies the Toroweap Formation and includes, in ascending order, the Fossil Mountain and Harrisburg Members, as defined by Sorauf and Billingsley (1991).

- The Fossil Mountain Member is a light-gray, cliff-forming, fine- to medium-grained, thin- to medium-bedded, cherty limestone containing silicified fossils. An unconformable contact with underlying Woods Ranch Member of Toroweap Formation is attributed to the solution of gypsum and channel erosion. Its thickness in the Planning Area is about 200 to 350 feet.
- The Harrisburg Member is a reddish-gray and brownish-gray, slope-forming siltstone, sandstone, and limestone. Gypsum dissolution is responsible for sinkhole depressions within the Harrisburg Member. Contact with the underlying Fossil Mountain Member is gradational. In the Planning Area, the Harrisburg Member ranges from about 250 to 550 feet thick.

Triassic

The contact between Permian and Triassic strata on the Planning Area represents a hiatus of several tens of millions of years where nondeposition or erosion took place (Nations and Stump, 1981). In the Planning Area, the Triassic Period was a time of general emergence. These strata progress from shallow marine sediments deposited along the margins of seas that existed to the northwest and north to fluvial and lacustrine red beds.

Triassic strata, in ascending order, are the Moenkopi, Chinle Formations, and the (Triassic and Jurassic) Glen Canyon Group's Moenave Formation. The Moenkopi and Chinle Formations are exposed on the western side of the Hurricane fault and to the east in House Rock Valley. The Glen Canyon Group occurs in an outcrop just west of Colorado City, at the Paria Plateau north of House Rock Valley, and in the Grand Wash Trough along the east flank of the Virgin Mountains.

The Moenkopi Formation is divided into, in ascending order, the Timpoweap, Lower Red, Virgin Limestone, Middle Red, Shnabkaib, and Upper Red Members as used by Stewart and others (1972). The unit thickness as a whole thins to the southeast within the Planning Area.

- The Timpoweap Member contains an upper cliff-forming unit and a lower cliff- and slope-forming unit. It contains gray, fine-grained, thick-bedded sandy limestone interbedded with coarse-grained, sandstone and a basal dark-gray, white and red-brown conglomerate derived from the Kaibab Formation. The contact with the underlying Kaibab Formation is unconformable and the thickness ranges from about 0 to 350 feet.
- The Lower Red Member is a red, thin-bedded, slope-forming, sandy siltstone, interbedded with gray, white, and pale yellow laminated gypsum and sandstone. The contact is interbedded or gradational with the underlying Timpoweap Member or otherwise unconformable with the Kaibab Formation and ranging from about 0 to 300 feet thick.
- The Virgin Limestone Member consists of two to four light-gray, thin-bedded to thinly-laminated, ledge-forming limestone beds, several to many feet thick, separated by slopes of white to pale yellow, red, thin-bedded, gypsum and gypsiferous siltstone. The member includes thin beds of brown, red, and green siltstone, gray limestone and green mudstone. It has an unconformable contact with the Lower Red Member and may be as much as 200 feet thick.
- The Middle Red is a thin-bedded, slope-forming, laminated siltstone and sandstone, with white and gray gypsum, minor white platy dolomite, green siltstone, and gray-green to red gypsiferous mudstone. It has a gradational contact with the Virgin Limestone Member and is approximately 150 feet thick.
- The Shnabkaib Members is an interbedded and intertonguing, white, light gray, laminated, slope-forming, aphanitic dolomite, silty gypsum, and red siltstone. It has a gradational contact with the Middle Red Member and is up to 700 feet thick.
- The Upper Red Member is a heterogeneous sequence of cliff and slope-forming red conglomerate, sandstone, siltstone, mudstone with minor gray gypsum. It has an unconformable contact with the underlying Shnabkaib Member and may be up to 200 feet thick.

The Chinle Formation in the Planning Area includes the older fluvial Shinarump and younger lacustrine Petrified Forest Members as defined by Stewart and others (1972).

- The Shinarump Member is an orange-brown, black, tan, cliff-forming, cross-stratified to massive-bedded, coarse-grained, fluvial, pebble conglomerate and conglomeratic sandstone. The contact is unconformable with the underlying Upper Red Member of the

- Moenkopi Formation and thickness generally ranging from 50 to 100 feet, thickening to the east.
- The Petrified Forest Member is a white, blue-gray, green-gray, pale-red, and purple-red, slope-forming lacustrine, mudstone, siltstone, and coarse-grained sandstone containing bentonitic clays. It has an unconformable contact with the underlying cliff-forming Shinarump Member with thickness generally ranging between 700 to 1,000 feet, thickening to the east.

The Moenave Formation is divided into, in ascending order, the Dinosaur Canyon, Whitmore Point and Springdale Sandstone Members (Wilson, 1967), which were deposited in a variety of fluvial and lacustrine environments.

- The Dinosaur Canyon Member consists of brown to reddish orange mostly slope-forming, thin-bedded, fine to very fine-grained sandstone and interbedded with lesser amounts of siltstone and mudstone. It has a disconformable contact with the eroded surface of the underlying Chinle Formation and averages between 150 and 200 feet thick.
- The Whitmore Point Member consists of alternating gray, greenish-gray, grayish-red, and pale-brown siltstone and claystone beds (Wilson, 1967). It also contains scarce thin light greenish-gray limestone beds (Folk, 1968). The contact with the Dinosaur Canyon Member is conformable and gradational and is named after the type location Whitmore Point in the Planning Area where it is 70 feet thick.
- The Springdale Sandstone Member is a light to reddish brown, ledge- and cliff-forming, medium- to massively-bedded, fine- to medium-grained, sandstone. The contact with the Whitmore Point Member is generally conformable and with a thickness ranging from approximately 125 to 175 feet, thinning to the west.

Jurassic

In the Planning Area, the Jurassic Period started with the deposition of nonmarine red beds in fluvial, distal fluvial/playa and lacustrine environments that existed as sediments were transported west from a source area in the ancestral Rocky Mountains (Wilson, 1967). As the climate changed, sand dunes spread down from Utah into northern Arizona and overwhelmed the sabkha creating vast dune fields that were subjected to annual monsoon rains (Loope et al., 2001). During the Middle Jurassic a shallow seaway that extended from the north to a point in the Planning Area just south of the Arizona state line and created off-shore shallow marine, tidal flat, sabkha and beach deposits (Doelling and Davis, 1989).

Jurassic strata, in ascending order, are the (Triassic and Jurassic) Kayenta Formation of the Glen Canyon Group, the Navajo Sandstone along with the San Rafael Group's Carmel Formation, and the Entrada Sandstone. The Glen Canyon Group occurs in outcrop just west of Colorado City, at

the Paria Plateau north of House Rock Valley, and in the Grand Wash Trough along the east flank of the Virgin Mountains. The San Rafael Group is mapped only in the extreme northeast on the Paria Plateau and northeast of the Paria River (Bush and Lane, 1980).

The Kayenta Formation is light brown to moderately reddish-orangish brown and consists chiefly of slope and ledge forming mudstones containing numerous interbeds of siltstone and very fine-grained sandstone with thin limestone beds in its upper part. The contact with the Springdale Sandstone Member is conformable and locally gradational. In the Planning Area, the Kayenta ranges in thickness from 115 to 300 feet (Bush and Lane, 1980).

The Navajo Sandstone is a reddish and less commonly pale-yellow to white, cliff-forming, fine-grained, well-sorted quartz arenite sandstone. The sand grains are well-rounded, frosted and poorly to moderately well-cemented by calcium carbonate. The contact with the underlying Kayenta Formation is conformable and gradational. In the Planning Area it ranges from 1680 to 1860 feet in thickness and forms nipples, buttes, and high sheer cliffs where exposed (Bush and Lane, 1980).

The Carmel Formation consists of ledge-forming and slope-forming mudstone, siltstone and fine- to medium-grained, thin- to thick-bedded sandstone. Cementation is weak to moderate and the colors are varied depending on the amount of iron oxide present and include reddish-orange, reddish-brown, white, brown, tan, grayish-brown, and various shades of yellow (Doelling and Davis, 1989). It rests unconformably on the Navajo Sandstone and is approximately 410 feet thick on the Paria Plateau (Bush and Lane, 1980).

The Entrada Sandstone is composed of cliff-forming and slope-forming, orangish to reddish siltstone, claystone and mostly very fine- to fine-grained quartzose sandstone. The contact with the underlying Carmel Formation is unconformable and on the Paria Plateau the Entrada Sandstone is approximately 660 feet thick (Bush and Lane, 1980).

Cretaceous

During the Pre-Cretaceous, regional northeastward tilting took place resulting the uplifting and erosion of rocks deformed during the Nevadan Revolution (Wilson, 1962). The only Cretaceous formation in the Planning Area is the Lower Cretaceous Willow Tank Formation, which was deposited in localized fluvial and lacustrine environments and outcrops in Grand Wash Trough along the east flank of the Virgin Mountains. Other Cretaceous rocks are not present in the Planning Area, either having never been deposited or eroded.

The Willow Tank Formation consists of red, gray, brown and tan, nonmarine claystone, siltstone, sandstone, and conglomerate. The conglomerate occurs mostly at the base as a discontinuous unit, but also occurs throughout formation in small amounts. The contact is unconformable with the underlying Navajo Sandstone and is approximately 200 feet thick (Billingsley and Workman, 2000).

Tertiary and Quaternary

Toward the end of the Cretaceous Period and the beginning of the Tertiary, the Laramide Orogeny resulted in gentle warping and high-angle faulting. North trending faults, developed during the Precambrian Era, were reactivated during this time period and resulted in the formation of many of the structural features presently exposed in the Planning Area (Baillieu and Zollinger, 1980).

In the Basin and Range, Late Cretaceous and early Tertiary compression resulted in major folding, reverse faulting, and thrust faulting that produced the Virgin Mountains (Billingsley and Workman, 2000). East-west extension during the late Miocene began to form the Mesquite Basin, the Grand Wash Trough, and the Grand Wash Cliffs (Hintze, 1986; Bohannon and others, 1993). Sedimentary rocks of both clastic and chemical composition were deposited in nonmarine environments during the formation of the Grand Wash Trough and the Mesquite Basin. Tertiary and Quaternary igneous activity resulted in the formation of pyroclastic deposits and extensive basalt flows in the western half of the Planning Area (Hayes, 1969).

Tertiary sedimentary rocks exposed west of the Grand Wash fault zone on the east flank of the Virgin Mountains are, in ascending order, the Miocene Rainbow Gardens Member of the Horse Spring Formation and the Miocene and Pleistocene Rocks of the Grand Wash Trough in the Grand Wash Trough area (informal name). In the Mesquite Basin, west of the Virgin Mountains, these rocks are named the Muddy Creek Formation and commonly are covered by a thin veneer of Quaternary sediments.

The Rainbow Gardens Member of the Horse Spring Formation is divided (Billingsley and Workman, 2000), in ascending order, into a conglomerate unit, tuffaceous limestone and sandstone unit, and a limestone unit. These units are nonmarine and have a combined thickness of approximately 500 feet. The contact with the Willow Tank Formation is unconformable.

The Rocks of the Grand Wash Trough are composed of a lower conglomerate facies and an upper sandstone and siltstone facies. These units are nonmarine and their thickness ranges from 0 to 1500 feet, thickening southeastward. An angular unconformity exists between the Rocks of the Grand Wash Trough and the Horse Spring Formation (Beard, 1996).

The Muddy Creek Formation outcrops in the Mesquite Basin and consists of lacustrine and fluvial sediments. Along the Virgin River and Beaver Dam Wash, it includes a dark-gray to brown, cliff-forming conglomerate, gravel, and sandstone that is poorly sorted and moderately well bedded. The Muddy Creek Formation in the vicinity of Mesquite, Nevada, is reported to be approximately 650 feet thick (Kowallis and Everett, 1986).

Tertiary and Quaternary tectonism resulted in igneous activity that produced pyroclastic deposits and extensive basalt flows on the western half of the Planning Area. The basalt is generally thin in these areas, but may reach thicknesses in excess of 200 to 300 feet in the southern Shivwits and Uinkaret plateau areas where extensive flows developed. Associated with these basalts are deposits of pumice. These deposits are generally of moderate size and occur in close proximity to the volcanic vents.

Unconsolidated Quaternary sediment occurs as alluvial fill west of the Grand Wash Cliffs and west of the Beaver Dam and Virgin Mountains. The alluvial deposits are composed of fluvial terrace-gravel and alluvial fan deposits. Landslide deposits are most common around and below Tertiary or Quaternary volcanic outcrops.

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APPENDIX 3.B

PALEONTOLOGICAL RESOURCES IN GEOLOGICAL UNITS OF THE PLANNING AREA

The following table lists the paleontological resources found in the geological units of the planning area. The resources are categorized by geological unit and type of resource. The table includes the name of the geological unit, the type of resource, and a brief description of the resource. The resources are listed in descending order of geological age.

Geological Unit	Type of Resource	Description
Upper Cretaceous	Fossiliferous	Contains numerous fossiliferous layers, including dinosaur bones and plant fossils.
Lower Cretaceous	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Upper Jurassic	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Lower Jurassic	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Upper Triassic	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Lower Triassic	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Upper Permian	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Lower Permian	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Upper Carboniferous	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Lower Carboniferous	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Upper Devonian	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Lower Devonian	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Upper Silurian	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Lower Silurian	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Upper Ordovician	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Lower Ordovician	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Upper Cambrian	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.
Lower Cambrian	Fossiliferous	Contains fossiliferous layers, including dinosaur bones and plant fossils.

PALEONTOLOGICAL RESOURCES IN GEOLOGIC UNITS IN THE PLANNING AREA

<p><i>Precambrian or Archeozoic and Proterozoic Eras</i> (4.6 Billion to 570 Million Years Ago) The Precambrian rocks located within the Planning Area contain no paleontological resources.</p>
<p><i>Paleozoic Era</i> (570 to 240 Million Years Ago) The Paleozoic Era is divided into seven periods: Cambrian, Ordovician, Silurian, Devonian, Mississippian, Pennsylvanian, and Permian.</p>
<p><u>Cambrian Period</u> (570 to 500 Million Years Ago) The Cambrian Formations present in the Planning Area are collectively referred to as the Tonto Group. The Tonto Group includes the Tapeats Sandstone, Bright Angle Shale, and the Muave Limestone:</p> <ul style="list-style-type: none"> • Tapeats Sandstone (Lower and Middle Cambrian): No vertebrate or invertebrate fossils reported within the formation. • Bright Angle Shale (Middle Cambrian): No vertebrate fossils are reported from within the formation. Hard to find trilobites and worm trails are known to occur (Longwell, 1928). • Muave Limestone (Middle Cambrian): No vertebrate fossils are reported from within the formation. Occasional fossil brachiopods, hyolithids, eocrinoids, trilobites and ostacods are known to occur (McKee, 1982a).
<p><u>Ordovician Period</u> (500 to 435 Million Years Ago) Ordovician rocks are not present on the Planning Area and correspond to a stratigraphic break that represents a period of erosion or non-deposition.</p>
<p><u>Silurian Period</u> (435 to 410 Million Years Ago) Silurian rocks are not present on the Planning Area and correspond to a stratigraphic break that represents a period of erosion or non-deposition.</p>
<p><u>Devonian Period</u> (410 to 360 Million Years Ago) Devonian rocks are represented in the Planning Area by the Temple Butte Formation (Middle and Upper Devonian). Vertebrate fossils of an uncommon fish (<i>Placoderms</i>) are reported from within the formation in the eastern Grand Canyon area (Beus, 1980). Locally fossiliferous beds may contain algae and invertebrate conodonts, crinoid plates, brachiopods, mollusks and corals (McKee, 1969).</p>
<p><u>Mississippian Period</u> (360 to 330 Million Years Ago) Mississippian strata in the Planning Area are referred to as the Redwall Limestone (Lower and Upper Mississippian). It includes four members as described by McKee (1963): the Whitmore Wash, Thunder Springs, Mooney Falls, and Horseshoe Mesa Members. No vertebrate fossils are reported from within the formation. The Whitmore Wash, Thunder Springs, and Mooney Falls members contain abundant invertebrate fossils and include foraminifers, corals, bryozoans, gastropods, pelecypods, cephalopods, blastoids, and crinoids (McKee and Gutschick, 1969). Fossils are not common in the Horseshoe Mesa Member, except locally. In the Virgin River Gorge, the Horseshoe Mesa Member contains gastropods, brachiopods, crinoids and bryozoan fragments (Steed, 1980).</p> <p>The recently discovered Surprise Canyon Formation (Upper Mississippian) has been mapped throughout the Grand Canyon and should occur in the Planning Area. Vertebrate fossils of shark teeth are reported from within the formation. Abundant invertebrate fossil foraminifers, conodonts, plants, brachiopods, gastropods, echinoderms, trilobites, and corals are known to occur (Billingsley and Beus, 1999).</p>
<p><u>Pennsylvanian Period</u> (330 to 290 Million Years Ago) In the Grand Canyon area, Pennsylvanian and lower Permian aged strata are referred to as the Supai Group. The Supai Group consists of the Watahomigi, Manakacha, Wescogame formations and the Permian Esplanade Sandstone. To the north, these rocks undergo a facies change from predominantly clastic sediments to carbonates represented by the Callville Formation.</p> <ul style="list-style-type: none"> • Callville Formation (Lower, Middle and Upper Pennsylvanian; Lower Permian): No vertebrate fossils are reported from within the formation. Locally fossiliferous limestone beds may contain algae and invertebrate

fusulinids, conodonts, trilobites (in uppermost beds), bryozoans, brachiopods, crinoids, and corals (Longwell, 1928; McNair, 1951; Munger, 1963; Pierce, 1979).

- Watahomigi Formation (Upper Mississippian and Lower Pennsylvanian): No vertebrate fossils are reported from within the formation. Locally fossiliferous limestone beds may contain algae and invertebrate foraminifera, fusulinids, conodonts, pelecypods, brachiopods, gastropods, bivalves, trilobites, bryozoans, corals, echinoid and crinoid fragments (Gordon and McKee, 1978; Pierce, 1979; McKee, 1982a; McKee, 1982b).
- Manakacha Formation (Middle Pennsylvanian): No vertebrate fossils are reported from within the formation. Locally fossiliferous limestone beds may contain algae and invertebrate foraminifera, fusulinids, brachiopods, gastropods, bivalves, trilobites, bryozoans, and corals (McKee, 1982b).
- Wescogame Formation (Upper Pennsylvanian): Vertebrate fossils of shark (*Deltodus*) teeth and trackways of quadrupeds (McKee, 1982b) are reported from within the formation. Locally fossiliferous beds may contain invertebrate foraminifera, fusulinids, pelecypods, gastropods, and corals (McKee, 1982a).

Permian Period (290 to 240 Million Years Ago)

The Permian Formations present in the Planning Area are the Esplanade Sandstone of the Supai Group (grades into the Pakoon Limestone to the west), Quantowep Sandstone (local to the Beaver Dam, Virgin Mountains and the Virgin River Canyon), Hermit Shale, Coconino Sandstone, Torowep Formation and Kaibab Formation.

- Esplanade Sandstone and Pakoon Limestone west of Hurricane Fault (Lower Permian): Vertebrate trackways having the appearance of horse hoof prints (McKee, 1982b) are reported from within this formation. Locally fossiliferous beds may contain algae and invertebrate fusulinids, brachiopods, gastropods, bryozoans, echinoderms, and corals (McKee, 1979; McKee, 1982c; McNair, 1951; Pierce, 1979).
- Quantowep Sandstone (Lower Permian): No vertebrate or invertebrate fossils are known to occur within the formation, although it is locally intensely burrowed (Hintze, 1986).
- Hermit Formation (Lower Permian): Vertebrate (amphibians) trackways are reported in the formation (McKee, 1965). Sparse invertebrate fossils may include plants (ferns and cone bearing plants), worm tracks, and insect wings (McKee, 1965).
- Coconino Sandstone (Lower Permian): Vertebrate (amphibians and reptiles) trackways are reported in the formation (Farmer, 1956; McKee, 1944; Rahm, 1974). Invertebrate tracks, and trails (worms, insects, and arthropods) are known to occur (Brady, 1939). Marine fossils (unspecified) in the limestone tongues are locally abundant (Bissell, 1969).
- Torowep Formation (Lower Permian): Includes the Seligman Members, Brady Canyon and Woods Ranch Members, as defined by Sorauf and Billingsley (1991). No vertebrate fossils are known to occur within the formation. Locally fossiliferous limestone beds may contain abundant invertebrate brachiopods, gastropods, bryozoans, crinoids, horn corals, and sponge fragments (Hintze, 1986). Sparse echinoid spines, ostracodes, and trilobite fragments are also known to occur (Billingsley and Wellmeyer, 2003; Rawson and Turner-Peterson, 1980). Locally, abundant pelecypods are also reported 14 to 20 feet below the contact with the Kaibab Formation (Cheevers, 1980).
- Kaibab Formation (Lower Permian): Includes the Fossil Mountain and Harrisburg Members, as defined by Sorauf and Billingsley (1991). No vertebrate fossils are known to occur within the formation. Locally fossiliferous limestone beds may contain algae and abundant invertebrate burrows, worm trails, brachiopods, crinoids, gastropods, pelecypods, corals, bryozoans, cephalopods, and sponges (Bissell, 1969; Cheevers, 1890; McKee, 1969; Schleh, 1966 and Wells, 1960) and rare reef-building corals (*Chaetetes milleporacens* and *Lophophyllum profundum*, McKee, 1938). Furthermore, unusual pelecypods (*Scaphellina concinna*, Boyd and Newell, 1978), known only in Arizona and Wyoming, along with rare and new species of trilobites (*Delaria macclintocki* and *Delaria snowi*, Cisne, 1971), and the discovery of a marine invertebrate of uncertain classification (*Comularia kaibabensis*, McKee, 1935), are reported.

Mesozoic Era (240 to 66 Million Years Ago)

The Mesozoic Era is often referred to as the “age of dinosaurs.” The Mesozoic Era is divided into three periods: Triassic, Jurassic, and Cretaceous.

Triassic Period (240 to 205 Million Years Ago)

The Triassic Formations present in the Planning Area consist of the Moenkopi Formation, Chinle Formation and the Moenave Formation of the Glen Canyon Group.

- Moenkopi Formation (Lower and Middle? Triassic): Includes the Timpoweap, Lower Red, Virgin Limestone, Middle Red, Shnabkaib and Upper Red Members as defined by Stewart and others (1972). Vertebrate fish, amphibians and a variety of reptiles including their tracks are reported (Breed and Wright, 1968). Locally fossiliferous beds containing algae, wood and invertebrate worm trails, pelecypods, ostracodes, scaphopods, brachiopods, gastropods, cephalopods (amminoids), and crinoids are known to occur (Gregory, 1950; Irwin, 1977; Poborski, 1954 and Shimer, 1919).
- Chinle Formation (Upper Triassic): Includes the Shinarump and Petrified Forest Members as defined by Stewart and others (1972). Vertebrate fossils of fish, amphibians, phytosaurs and other reptilian remains including their tracks are reported in this formation (Breed and Wright, 1968). Locally fossiliferous beds containing invertebrate pelecypods, gastropods, and insects are known to occur (Ash and May, 1969; Gregory, 1957). Fossilized plants, wood fragments, logs, are widespread and abundant (Nations and Stump, 1981).
- Moenave Formation (Upper Triassic and Lower Jurassic): Is divided into the Dinosaur Canyon, Whitmore Point and Springdale Sandstone Members (Wilson, 1967). Vertebrate fossils of fish, reptile (*Protosuchus*) and dinosaur bones (*Coelophys* and *Dilophosaurus*) including their tracks are reported (Breed and Wright, 1968). Locally fossiliferous beds containing plants and invertebrate ostracodes are known to occur (Harshbarger, et al., 1957; Wells, 1960).

Jurassic Period (205 to 138 Million Years Ago)

The Jurassic Formations present in the Planning Area are the Kayenta Formation and Navajo Sandstone of the Glen Canyon Group along with the Carmel Formation and Entrada Sandstone of the San Rafael Group.

- Kayenta Formation (Upper Triassic? and Lower Jurassic): Vertebrate fossils of amphibians, crocodillans, turtles, lizards, dinosaurs and early mammals are reported east of the Planning Area, near Tuba City. In the Planning Area, some beds of the Kayenta Formation are locally fossiliferous and may contain various dinosaurs based on findings of bones and footprints (Colbert, 1974; Harshbarger, et al., 1957). Plant and invertebrate fossils are not known to occur.
- Navajo Sandstone (Lower Jurassic): Fossilized dinosaur tracks and invertebrate burrows are known to occur in the formation (Colbert, 1974; Harshbarger, et al., 1957). Localized, lenticular beds of limestone or dolomite containing fossil dinosaur bones, invertebrate ostracodes, brachiopods, trace fossils, and plants and algae are reported (Stokes, 1991).
- Carmel Formation (Middle Jurassic): No vertebrate fossils are known to occur within the formation. Fossiliferous beds of the Carmel Formation at Zion National Park, approximately 20 miles north, contain algae, invertebrate gastropods, crinoids, pectens, oysters, and other bivalves (Santucci, 2003).
- Entrada Sandstone (Upper Jurassic): No vertebrate or invertebrate fossils known to occur within the formation.

Cretaceous Period (138 to 66 Million Years Ago)

- The only Cretaceous Formation present in the Planning Area is the Willow Tank Formation (Lower Cretaceous). No vertebrate or invertebrate fossils known to occur within the formation.

Cenozoic Era (66 Million Years Ago to Present Day)

The Cenozoic Era, also known as the "age of mammals" spans from 66 million years ago to the present day. The Cenozoic Era is broken into two periods of geologic time: the Tertiary and the Quaternary. The Tertiary Period is further broken down into five epochs: the Paleocene, Eocene, Oligocene, Miocene, and Pliocene. The Quaternary Period is broken down into two epochs: the Pleistocene (the time of the "ice ages") and Holocene (or Recent, our current epoch of geologic time).

Tertiary Period (66 to 1.6 Million Years Ago)

The Tertiary Period is broken down into five epochs: the Paleocene, Eocene, Oligocene, Miocene, and Pliocene.

- Paleocene-Eocene-Oligocene Epoch (66 to 24 Million Years Ago): There are no rocks or paleontological resources of Paleocene, Eocene, or Oligocene age in the Planning Area.
- Miocene-Pliocene-Pleistocene Epoch: Strata of this age in the Planning Area consist of the Rainbow Gardens Member of the Horse Spring Formation, Rocks of the Grand Wash Trough, and Muddy Creek Formation.
- Rainbow Gardens Member of the Horse Spring Formation (Miocene): No vertebrate or invertebrate fossils known to occur within the formation.
- Rocks of the Grand Wash Trough (Miocene and Pleistocene): No vertebrate or invertebrate fossils known to occur within the formation. Fresh water plant fossils are reported in the Formation (Billingsley, G., personal

communication, February 2004).

- Muddy Creek Formation (Miocene and Pleistocene): Fossil camel bones are described in the Muddy Creek Formation (Longwell, 1928), the location is probably from southeastern Nevada near the Arizona border. These and other vertebrates could exist in the Planning Area.

Quaternary Period (1.6 Million Years Ago to Present Day)

The Quaternary Period is broken down into two epochs: the Pleistocene and Holocene.

- Vertebrate fossil bones of fish, reptile, bird and mammals of probable Late Pleistocene age have been found in caves (Mead, 1981; Parmalee, 1969). Fossilized packrat middens indicate which plant species were present in the Late Pleistocene and Holocene (Cole, 1982).

Source: Created according to: Hansen, W.R., 1991, Suggestions to authors of reports of the United States Geological Survey (7th edition): Washington, D.C., U.S. Geological Survey, 289 pp.

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DEFINITIONS FOR BLM FIRE MANAGEMENT ALLOCATIONS

The Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management directs the assignment of BLM-administered public lands to one of the following two land use allocations:

Wildland Fire Use: Areas suitable for wildland fire use for resource management benefit

Areas where wildland fire is desired, and there are few or no constraints for its use. Where conditions are suitable, unplanned and planned wildfire may be used to achieve desired objectives, such as to improve vegetation, wildlife habitat or watershed conditions, maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires, and meet resource objectives. Where fuel loading is high but conditions are not initially suitable for wildland fire, fuel loads are reduced by mechanical, chemical or biological means to reduce hazardous fuels levels and meet resource objectives (includes WUI areas).

Non Wildland Fire Use: Areas not suitable for wildland fire use for resource benefit

This allocation includes areas where mitigation and suppression are required to prevent direct threats to life or property. It includes areas where fire never played a large role, historically, in the development and maintenance of the ecosystem, and some areas where fire return intervals were very long. It also includes areas (including some WUI areas) where an unplanned ignition could have negative effects to the ecosystem unless some form of mitigation takes place. Mitigation may include mechanical, biological, chemical, or prescribed fire means to maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires, and meet resource objectives.

The allocation of lands is based on the desired future condition of vegetation communities, ecological conditions, and ecological risks. The allocation of lands is determined by contrasting current and historical conditions and ecological risks associated with any changes. The condition class concept helps describe alterations in key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. BLM Fire Management Plans will include the two allocations and identify areas for including fire use, mechanical, biological, or chemical means to maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires, and meet resource objectives. They will also identify areas for exclusion from fire (through fire suppression), chemical, mechanical, and/or biological treatments.

APPENDIX 3.D

IDENTIFICATION OF WILDERNESS CHARACTERISTICS ON THE ARIZONA STRIP

IDENTIFICATION OF WILDERNESS CHARACTERISTICS ON THE ARIZONA STRIP

BACKGROUND

The official manual for wilderness inventory, *Wilderness Inventory and Study Procedures Handbook (H-1630-1)*, was rescinded September 29, 2003 by Bureau of Land Management (BLM) Instruction Memorandum 2003-274, *BLM Implementation of the Settlement of Utah v. Norton Regarding Wilderness Study*. Instruction Memorandum 2003-275, Change 1, *Consideration of Wilderness Characteristics in Land Use Plans*, was issued on October 23, 2003 and is the sole guidance for the consideration of wilderness characteristics in the land use planning process.

Instruction Memorandum 2003-275, Change 1 states that “the BLM may consider information on wilderness characteristics, along with information on other uses and values, when preparing land use plans.” The guidance also states that the consideration of wilderness characteristics in the land use planning process has the potential for three distinct outcomes:

- 1) giving priority to other uses over the protection of wilderness characteristics;
- 2) giving priority to other uses but applying management restrictions to protect some or all of the wilderness characteristics; and
- 3) giving priority to the protection of wilderness characteristics.

The current guidance also authorizes the BLM to consider wilderness proposals from the public during the land use planning process. A proposal for additional wilderness study areas was received from the Arizona Wilderness Coalition (AWC) during scoping. This information may be used to assist in developing a range of alternatives. Since alternatives are developed to reflect a reasonable range of management options, consideration of all legitimate information sources, including wilderness characteristics, is a valid part of the planning process.

In order to plan for and manage BLM and National Park Service (NPS) lands as seamlessly as possible, the NPS adopted the BLM’s process to identify and protect lands having wilderness characteristics on NPS lands outside of proposed wilderness.

Identifying Wilderness Characteristics

Before wilderness characteristics can be considered in the land use planning process, those characteristics must first be identified. BLM IM 2003-275, Change 1, Attachment 1, provides definitions for each of three distinct wilderness characteristics that were evaluated: Naturalness, Solitude, and Primitive, Unconfined Recreation. Under the previous wilderness inventory handbook guidance, these characteristics were inventoried and collectively, along with size criteria and optional supplemental values, considered as “wilderness character,” tied to the Wilderness Act of 1964. Under IM 2003-274 and 275, Change 1, wilderness characteristics do not fall under Wilderness Act definitions or process, but are defined by the IM and considered in planning under the auspices of the Federal Land Policy and Management Act (FLPMA).

Therefore, though the terms “naturalness”, “solitude”, and “primitive, unconfined recreation” are the same, what they mean and how they are evaluated differ greatly. For instance, under the previous wilderness inventory handbook, a combination of size, naturalness and either solitude and/or primitive, unconfined recreation were required to be present for “wilderness character” to be deemed present. Whereas, under BLM IM 2003-275, Change 1, there is no requirement for a combination of wilderness characteristics to be considered in the land use planning process; theoretically, only one characteristic could be present and/or considered. This important distinction, among others, affected the findings of the evaluation of all areas proposed.

To summarize, all areas were initially proposed under the now-rescinded guidance that was based in the Wilderness Act and used criteria that is now-revoked. Using the current BLM IM 2003-275, Change 1 guidance, evaluation results in somewhat different findings than would have resulted had the policy guidance not changed. This was the basis for the work that took place to identify those areas of the Arizona Strip that contain one or more wilderness characteristics. This process also satisfies the requirement to adequately analyze the wilderness proposal submitted by the AWC.

IDENTIFICATION OF INDIVIDUAL CHARACTERISTICS

The current guidance states that wilderness characteristics are those “features of the land associated with the concept of wilderness that may be considered in land use planning when BLM determines that those characteristics are reasonably present, of sufficient value (condition, uniqueness, relevance, importance) and need (trend, risk), and are practical to manage.” This guidance was applied to the identification of all three types of wilderness characteristics.

Overview of Wilderness Characteristics Identification Process

The process of identifying areas having wilderness characteristics began with the proposal for additional wilderness study areas submitted by the AWC. The proposal came in the form of hard

copy maps and GIS data. The GIS data submission was for the Grand Canyon Parashant National Monument only. The remainder of their proposal was recreated in GIS by BLM/NPS from submitted hard copy maps.

The AWC proposal was used as the basis for field evaluations and subsequent identification of lands with wilderness characteristics. BLM/NPS staff also identified several potential areas with wilderness characteristics that were did not coincide with the AWC proposal.

The process was conducted in three parts: field evaluation, GIS data development and analysis, and alternative development.

Field Evaluation

The individual units that comprise the AWC proposal and those preliminarily identified by BLM recreation planners were used as a base layer on GIS generated field maps. Maps were created for each proposed unit by BLM and NPS staff, using existing GIS data themes, such as, known transportation routes, cultural information, water sources, campsite information, etc. AWC proposed route closures were then color coded on each map for field identification.

The first step in the screening process was to assess each unit in the field, using the *Wilderness characteristics assessment* form to document field observations (see sample form below).

Because numerous photographs were part of the AWC proposal document, an effort was made to replicate a sampling of photo points to verify information and document features. At numerous sites, the submitted photographs were not taken at the locations stated, and in some cases were not within the proposed units.

In the field, the data collection process entailed assessing each unit using the standardized format mentioned above (*Wilderness Characteristics Assessment* form.) Photos were taken that reflected a variety of information. Features such as transportation routes, water developments, grazing related facilities, historic structures, unique geologic features, etc. were recorded.

Office Evaluation

With all of the field information complete, the data development process began. This consisted of drawing polygons for each of the three wilderness characteristics, based on data gathered in the field and other GIS data sources. Each characteristic was treated as a separate and unique entity using the following criteria, and new GIS layers were the end result.

The final step in the initial documentation process was downloading digital photos, completing the narratives, and generating new GIS data that reflected existing site conditions for each unit. All of the information is assembled into a case file type format with the AWC information and BLM/NPS information assembled by AWC proposed unit and/or subunit.

Naturalness

The primary factor when determining the existence of naturalness was based on the following from IM 2003-275, Attachment 1: "Lands and resources exhibit a high degree of naturalness when affected primarily by the forces of nature and where the imprint of human activity is substantially unnoticeable. BLM has authority to inventory, assess, and/or monitor the attributes of the lands and resources on public lands, which, taken together, are an indication of an area's naturalness. These attributes may include the presence or absence of roads and trails, fences or other improvements; the nature and extent of landscape modifications; the presence of native vegetation communities; and the connectivity of habitats."

Working from the initial base layer polygons (from AWC and BLM/NPS planners), areas within those polygons that met the naturalness criteria based on field evaluations were then identified using the following techniques.

1. Well-used routes that would remain open as part of the route evaluation process were cherry stemmed (buffered) to exclude them.
2. Some seldom used routes were included in the new polygons only if it was determined that they did not detract from the overall naturalness of an area. Many of these routes were later proposed to be closed as part of the route evaluation process.
3. Routes that were being reclaimed by natural processes were included in the new polygons because it was assumed that they would gradually fade into the natural landscape over time.
4. Most highly visible fences and range improvements were excluded from the new polygons because they detract from the naturalness of an area. This did not include all fences and range improvements, as some were determined to be substantially unnoticeable and thus did not detract from the overall naturalness of an area. In this case, substantially unnoticeable was assumed for developments that were small, insignificant, or situated so that they are difficult to see.
5. Vegetation treatments and other significant landscape modifications were excluded from the new polygons unless they had recovered to the point where they were substantially unnoticeable.
6. The final step was a cumulative assessment and conclusion about on-the-ground observations. How did the area appear overall? If there was a lack of modification and the area mostly "natural," it was included. If modifications were predominant, it was excluded.

Solitude and Primitive/Unconfined Recreation

In the current guidance, these two wilderness characteristics share the following definition.

"Visitors may have outstanding opportunities for solitude, or primitive and unconfined types of

recreation when the sights, sounds, and evidence of other people are rare or infrequent, where visitors can be isolated, alone or secluded from others, where the use of an area is through non-motorized, non-mechanical means, and where no or minimal recreation facilities are encountered.”

Sharing the same definition did not necessarily mean they shared the same polygons. Solitude and Primitive Recreation are separate and distinct concepts, though they often coexist.

Solitude

Solitude exists in the absence of human contact and since the majority of human contact on the Arizona Strip occurs in proximity to motorized routes it was determined to use the existing Recreation Opportunity Spectrum (ROS) GIS data to help define this layer.

ROS remoteness criteria is based on the effects of possible sights of and sounds from roadways. The majority of areas that mapped remoteness as Primitive (P) and Semi-Primitive Non-Motorized (SPNM) classes on the Arizona Strip are true roadless areas, being at least ½-mile from any road. These areas almost always corresponded with the AWC proposed areas. The P and SPNM units were used in conjunction with the new naturalness layer to help create a solitude layer. The following techniques were used:

1. The newly created “Naturalness” GIS layer was used as a starting point.
2. The P and SPNM units were selected from the ROS layer and used as a preliminary “Solitude” layer.
3. A union was performed on the Naturalness and Solitude layers. The new layer contained the attributes of both layers.
4. Where the naturalness and solitude layers overlapped, new polygons were created to form the final “Solitude” layer.

It should be noted that solitude polygons were generated in GIS using the standard ½-mile offset from roads. It is possible that some of these polygons would have been larger if vegetative and topographic screening were factored into the determination. This situation was recognized during the process and final lines were redrawn on an individual basis later in the process.

Primitive/Unconfined Recreation

Primitive recreation polygons were defined by analyzing where the use of the area is typically through non-motorized, non-mechanical means, and where no or minimal developed recreation facilities exist. Additionally, primitive recreation polygons were derived by analyzing the following GIS data layers and through the field knowledge of existing staff. Polygons were

drawn for areas that were determined to contain high quality (outstanding) opportunities for primitive/unconfined recreation.

1. Naturalness
2. Solitude
3. High quality primitive areas previously defined in the planning effort
4. Recreation Opportunity Spectrum
5. Topography
6. Route Inventory
7. Staff knowledge

ALTERNATIVE DEVELOPMENT

After lands with wilderness characteristics had been adequately mapped, the next step was to determine how the supply of wilderness characteristics fit into each of the alternatives. While no selection criteria currently exists, IM 2003-275, Change 1 provides three components that offered an adequate framework.

Excerpt from IM 2003-275, Change 1:

*Features of the land associated with the concept of wilderness that may be considered in land use planning when the BLM determines that those characteristics are **reasonably present**, of **sufficient value** (condition, uniqueness, relevance, importance), and **need** (trend, risk), and are **practical to manage**.*

Ranking Areas with Wilderness Characteristics

Each of the three components noted above was used as a basis for determining the quality and providing a ranking for areas with wilderness characteristics. The process was straightforward. Points were applied to each polygon in each of the three wilderness characteristic classes based on three specific criteria—Value, Sensitivity, and Manageability. The result is three sets of numbers that provide information on each polygon. That information complies with IM 2003-275, Change 1, by defining how valuable each area is, how manageable each area is, and how much each area is at risk from outside influences.

There was only one pre-determined criteria. For an area to be considered during the ranking process, it must contain at least two of the three wilderness characteristics: Naturalness, Solitude, or Primitive/Unconfined Recreation.

The Ranking Process

The process below was used by Arizona Strip District Recreation/Wilderness planners to provide a numeric score for each area with wilderness characteristics.

VALUE

A yes answer to any of the statements in this section results in the listed point total for that statement.

1. Overlaps with an additional (third) wilderness characteristic polygon.
12 Points
2. Is contiguous to an existing designated wilderness or an NPS proposed wilderness area.
8 Points
3. Any portion of the polygon area is coincidental with a corresponding Semi-Primitive Non-Motorized ROS polygon.
5 Points
4. Contains listed species or other critical T and E plant/wildlife habitat that would be enhanced/protected by MWC status.
3 Points
5. Contains known cultural sites or areas that would be enhanced/protected by MWC status.
2 Points
6. Any portion of the polygon area is coincidental with VRM inventory class 2.
2 Points
7. Contains specific geologic, biologic, or other natural features that are distinctive or exceptional.
2 Points

Total Possible Points for Value Section: 34

NEED (trend, risk)

A yes answer to any of the statements in this section results in the listed point total for that statement.

1. This area is considered to be at high risk. This may be due to one or more of the following conditions:
 - a. The area is in close proximity to a community interface zone (generally less than ten miles)
 - b. The area is outside national monument, existing ACEC boundaries, other protective withdrawals, or special designations.
 - c. The topography is generally low relief and/or has large sections along the boundary that are conducive to unauthorized motorized access.

- d. The area has high potential for increased visitation over the next twenty years.

10 Points

2. This area is considered to be at moderate risk. This may be due to one or more of the following conditions:

- a. The area is within moderate proximity to a community interface zone (generally between 10 and 25 miles);
- b. The area may be either inside or outside national monument, existing ACEC boundaries, other protective withdrawals, or special designations.
- c. The topography is generally low to moderate relief and/or has some sections along the boundary that are conducive to unauthorized motorized access.
- d. The area has moderate potential for increased visitation over the next twenty years.

6 Points

3. This area is considered to be at low risk. This may be due to one or more of the following conditions:

- a. The area is a considerable distance from a community interface zone (generally more than 25 miles)
- b. The area may be either inside or outside national monument, existing ACEC boundaries, other protective withdrawals, or special designations.
- c. The topography is generally moderate to high relief and/or has few sections along the boundary that are conducive to unauthorized motorized access.
- d. The area has low potential for increased visitation over the next twenty years.

3 Points

4. This area is considered to be at low risk. This may be due to one or more of the following conditions:

- a. The area is a considerable distance from a community interface zone (generally more than 25 miles)
- b. The area is inside a national monument, existing ACEC boundary, other protective withdrawal, or special designation.
- c. The topography is generally moderate to high relief and/or has no sections along the boundary that are conducive to unauthorized motorized access.
- d. The area has very low potential for increased visitation over the next twenty years.

1 Point

Total Possible Points for Sensitivity Section: 10

MANAGEABILITY

A yes answer to any of the statements in this section results in the listed point total for that statement.

1. Management of this area is the most efficient and effective, due to one or more of the following conditions:
 - a. Topographic or vegetative features provide natural barriers to vehicular intrusions.
 - b. Vehicular access to the perimeter is limited by natural barriers and parking is clustered in areas considered easy to manage.
 - c. Current use patterns are well known and are not expected to place additional stress on the resources required to manage the area.
 - d. Future use patterns and outdoor trends are not expected to place additional stress on the resources required to manage area.
 - e. Budget constraints are not expected to affect the resources required for adequate management of the area.
 - f. Enforcement activities are expected to be minimal.

10 Points

2. Management of this area is efficient and effective, due to one or more of the following conditions:
 - a. Topographic or vegetative features provide some natural barriers to vehicular intrusions, but portions of the area may be more difficult to manage.
 - b. Vehicular access to a majority of the perimeter is limited by natural barriers and a most of the parking is clustered in areas considered easy to manage, but may be scattered in other areas.
 - c. Current use patterns are known or can be predicted and are expected to place a minimal amount of additional stress on the resources required to manage the area.
 - d. Future use patterns and outdoor trends are expected to place a minimal amount of additional stress on the resources required to manage the area.
 - e. Budget constraints are expected to have a minimal effect on the resources required for adequate management of the area.
 - f. Enforcement activities are expected to be minimal to moderate.

6 Points

3. Management of this area is moderately efficient and effective, due to one or more of the following conditions:
 - a. Topographic or vegetative features provide few natural barriers to vehicular intrusions, and portions of the area may be difficult to manage.
 - b. Vehicular access to most of the perimeter is not limited by natural barriers and most of the parking is dispersed over the perimeter.
 - c. Current use patterns may or may not be well known and are expected to place a moderate amount of stress on the resources required to manage the area.

- d. Future use patterns and outdoor trends are expected to place a moderate amount of stress on the resources required to manage the area.
- e. Budget constraints may have a negative effect on the resources required for adequate management of the area.
- f. Enforcement activities are expected to be moderate.

3 Points

- 4. Management of this area is the least efficient and effective, due to one or more of the following conditions:
 - a. Topographic or vegetative features provide almost no natural barriers to vehicular intrusions, and portions of the area may be very difficult to manage.
 - b. Vehicular access to most of the perimeter is unlimited and parking areas are widely dispersed.
 - c. Current use patterns may or may not be known and are expected to place a significant amount of stress on the resources required to manage the area .
 - d. Future use patterns and outdoor trends are expected to place a significant amount of stress on the resources required to manage the area.
 - e. Budget constraints will negatively affect adequate management of the area.
 - f. Enforcement activities are expected to be significant.

1 Point**Total Possible Points for Manageability Section: 10****Final Alternative Determination**

Once a numeric total had been assigned to each area with wilderness characteristics, GIS maps were generated for both monuments and for the Arizona Strip Field Office. The maps contained wilderness characteristic polygons and their numeric ranking. In addition, other applicable planning data was placed on the maps. Using all available information, managers then made the final decision on which areas, or portions thereof, would be included in each alternative.

Sample of Standardized Evaluation Form

WILDERNESS CHARACTERISTICS ASSESSMENT

Area Name:

Proposal Source: Public _____ BLM _____ Other _____

Documentation Team:

Date:

I. PROPOSAL SUMMARY: (Provide a synopsis of the proposal and/or new resource information that has been provided as part of the planning process.)

II. AREA DESCRIPTION: (Include a concise summary of pertinent information listed below.)

A. Land Ownership & Acreage:

B. Topography:

C. Vegetation:

D. Existing Issues:

E. Current Management Allocations/Prescriptions (RMP, AMP, HMP, etc.):

F. Location and Access:

G. List of Topographic Maps:

Area Name:

III. NATURALNESS

Evaluate the extent to which past and present human activities have been established and the degree to which they might affect naturalness as defined: *“Lands and resources exhibit a high degree of naturalness when **affected primarily** by the forces of nature and where the **imprint** of human activity is **substantially unnoticeable**.”* (IM 2003-275, Attachment 1)

DEFINITIONS: **Affected:** “Acted upon , influenced. To have brought about a change in.”; **Primarily:** “At first; originally. Principally; chiefly.” **Imprint:** “A distinguishing influence or effect.”; **Substantial:** “Being of considerable importance, value, degree, amount, or extent.” **Unnoticeable:** “Not readily attracting notice (observation, attention)”

Summary of Attributes	Yes	No	If No, list #
Are motor vehicle travel routes absent from the area?			
Are fences or other developments absent from the area?			
Are other landscape modifications, such as vegetative treatment areas, active or inactive mines, spoils, or prospects, etc., absent from the area?			
Are native vegetation communities present?			
Does the area provide or contribute to the connectivity of habitats?			
Do the proposal’s photo points and/or descriptions accurately reflect existing conditions?			X
Do developments create visual contrast levels that cause them to be ‘substantially <u>noticeable</u> ’?			X

Document the information above using photo points, field maps and appropriate GIS themes including a “Naturalness” layer.

Narrative: (Describe your assessment of the attributes listed above. Provide rationale for your determination of whether or not the attributes, when taken together, indicate the presence or absence of natural conditions in the area or portions of the area. If determined to be present, does the area exhibit a **high degree** of naturalness.)

Present travel routes: (List or attach map)

Photo Points: (List and attach)

Area Name:

IV. SOLITUDE

Evaluate the extent to which **outstanding opportunities** for solitude exist in the area as defined: *“When the sights, sounds, and evidence of other people are **rare or infrequent** and where visitors can be isolated, alone or **secluded** from others.” (IM 2003-275, Attachment 1)*

DEFINITIONS: **Outstanding:** “Standing out; projecting outward or upward. Conspicuous among other of its kind; prominent. Pre-eminent among others of its kind; distinguished.”; **Opportunity:** “A favorable or promising combination of circumstances. A favorable time or circumstance.”; **Rare:** “Infrequently occurring; uncommon. Highly valued owing to uncommonness; special.”; **Infrequent:** “Not frequent; rare. Not occurring regularly; occasional.”; **Secluded:** “Removed or remote from others; solitary. Screened from view.”

Summary of Attributes	Yes	No
Does the area possess a landform that is of moderate to rugged relief that would provide some degree of screening from other people who might be in the area?		
Does the area possess adequate vegetation that would provide some degree of screening from other people who might be in the area?		
Does the size of the area contribute to creating opportunities for visitors to enjoy the area without frequent contact with others in the area?		
Are sights, sounds and evidence of other people in area rare or infrequent?		
Are sights, sounds and evidence of low-flying aircraft infrequent?		
Does the area allow visitors to be isolated, alone or secluded from others?		
If vehicle routes are present, is the distance from such routes, existing vegetative cover and/or infrequent use of the route adequate to allow for solitude?		
Is the area distant from communities and urbanization or difficult to reach by motor vehicle?		

Document the information above using photo points, field maps and appropriate GIS themes including a “Solitude” layer.

Narrative: (Describe your assessment of the attributes listed above. Provide rationale for your determination of whether or not the attributes, when taken together; indicate **outstanding** opportunities for solitude in the area or portions of the area. Describe relevant visitor use statistics (RMiS) and typical activities, where available. Also assess the effect of topography and vegetation as factors that affect the potential for screening visitors from one another.)

ALLOTMENT ACRES BY LAND STATUS

Allotment	Allotment Number	State Acres	Private Acres	Other Federal Acres	Public Acres
<i>Parashant</i>					
Belnap	04849	640	1,550		7,279
Belnap West	04822		120		4,317
Big Spring Pipeline	04870	1,280	280	13,680	36,790
Cottonwood	04809				33,129
Dripping Spring	04818			9,774	1,290
Duncan Tank	04820	1,220	2,168		6,250
Hidden Hills	04825	3,428			45,999
Hidden Spring	04803	565			18,642
Imlay	04817	320			15,534
Jump Canyon	04801	1,840			26,108
Last Chance	04815	640			9,072
Lime Spring	02012		160		3,596
Link Spring	04819	320			27,689
Mosby	04835	434			1,136
Mosby-Nay	04836	1,847			29,107
Mt Trumbull	04826	2,000	2,240	15,817	13,210
Mt. Logan	05218	1,120			18,996
Mud And Cane Spring	04850	1,921			81,910
Mule Canyon	04821			15,133	1,291
Pakoon	04802	280			55,938
Pakoon Springs	04800	648	240		36,466
Parashaunt Amp	04829				52,923
Pa's Pocket	04848	606			8,087
Penns Well	04852	640	620		4,225
Red Pond	04806	1,670	80	11,302	51,461
Sullivan Tank	04816				13,392
Tassi	04851	600	163	49,600	61,967
Tuweep	05220	2,799			41,650
Wildcat	04854	2,562	5,341		87,159
Summary for Parashant (29 detail records)		27,380	12,962	115,306	794,613
<i>Vermilion</i>					
Badger Creek	05341				6,272
Beanhole Well	05334	1,960			18,960
Bunting Well	04847	36,614			22,670
Coyote	05327	4,040			36,721
Ferry Swale	05336	4,584	0	16,994	18,200

ALLOTMENT ACRES BY LAND STATUS					
Allotment	Allotment Number	State Acres	Private Acres	Other Federal Acres	Public Acres
House Rock	05331	920	210		16,909
Sand Hills	05328	11,727	260		186,082
Signature Rock	05350		840		3,840
Soap Creek	05332	5,840	355	3,760	116,592
Wahweap	05340			5,990	
Summary for Vermilion (10 detail records)		65,685	1,665	26,744	426,246
<i>Arizona Strip FO</i>					
Antelope	05206	1,280	40		14,390
Antelope Spring	05210	1,920	760		14,940
Atkin Well	05207	477	2,555		25,220
Beaver Dam Slope	04828	715	358		30,623
Black Canyon	05256	640			2,160
Black Knolls	05264	2,040	120		38,589
Black Rock	04841	3,540	590		36,392
Blake Pond	04813	1,255	80		19,388
Brown-Shumway	05302				1,477
Button	05308	640	520		4,500
Canaan Gap	05205	650	2,430		5,460
Cane Beds	05212	1,230	2,435		12,105
Cedar Knoll	05318				17,951
Cedar Pockets Ut	04866				11,256
Cedar Ridge	05303				1,420
Cedar Wash	04842				14,354
Chatterly	05307	640	80		4,170
Clay Spring	04845				11,921
Clayhole	05215	12,876	280		112,411
Cottonwood	05209				3,520
Cowboy Butte	05310	605	330		3,120
Coyote Spring	04805	360			20,437
Crosby Tank	05219	650	1,920		10,187
Diamond Butte	04833	320	1,600		3,536
Fern Tank	05217	2,960	40		48,269
Ferrin	05246				2,820
Flat Top Well	05214	1,120			8,625
Franks Reservoir	05325	711			6,589
Fuller Road	05324	2,618			24,333
Glazier Dam	05202	2,562	640		6,787
Gramma Point	05233	320			23,265
Gramma Spring	05225				4,495

ALLOTMENT ACRES BY LAND STATUS

Allotment	Allotment Number	State Acres	Private Acres	Other Federal Acres	Public Acres
Gulch	05230				3,400
Gunsight	05320				7,230
Hacks	05227	80			4,250
Harris Well	05238		4,160		2,640
Hat Knoll	04867		40		3,160
Head Of Hacks	05232	1,920			29,490
Herd House	00096	192	40		2,390
Highway	05309	2,790	1,280		13,010
Highway	04812				11,378
Home Ranch	05342				80
Homestead	05253	1,920	3,959		8,625
Hurricane Cliff	05251	320			5,040
Hurricane Rim	00114	960			8,395
Ivanpah	04858	1,279	680		12,997
Iverson	04834		2,080		320
Jackson Tank	04830				8,013
Jacob Canyon	05317	640			3,200
Joe	05245	3,320			320
Johnson Run	05330	1,240	720		8,243
June Tank	05221	4,480			111,316
Kanab Creek	05321	640			4,260
Kanab Gulch	05224				4,260
Lamb Tank	05257	640	640		6,990
Lambing-Starvation	04838	1,623			10,913
Lane	05271				640
Little Tank	04853	1,609			4,356
Little Wolf	04814				7,662
Littlefield	04843	148	881		2,097
Littlefield Comm.	04827	1,030	4,780		71,854
Lizard	04857	8,315			4,198
Loco Point	05260	640			5,720
Lost Spring Gap	05316				790
Lower Hurricane	04837	180	161		23,526
Mainstreet	04808	23,406	8,246	156,454	
Mesquite Community	04832			10,000	38,073
Moonshine	05237	320			9,725
Mormon Well	04844	2,806	155		12,892
Mountain Sheep	04824				1,960
Muggins Flat	05313	800			11,088
Mustang Spring	04859	640			9,308
Navajo Wells Ut	05348	960	360		6,736

ALLOTMENT ACRES BY LAND STATUS					
Allotment	Allotment Number	State Acres	Private Acres	Other Federal Acres	Public Acres
Pat's Pond	04862				640
Pigeon Tank	05322				10,825
Pipe Valley	05242	62			4,463
Pocum	04871				13,006
Pocum Tank	04840		200		8,212
Point Of Rock	05241	2,280	640		6,261
Pratt Tank	05314	1,370	920		21,905
Purgatory	04831				4,970
Quail Canyon	04856	160			15,784
Rider	05305	640			2,410
Rock Canyon	00099	407	640		1,360
Rock Canyon Tank	05319	1,080			21,990
Rock Pockets	05213	2,628	20		19,830
Rock Reservoir	05345				1,105
Sage	05311	280			3,380
Scotties Seep	05236	640			6,783
Shinarump	05301	463			1,100
Short Creek	05270	2,412	2,998		2,233
Shuttleworth	05315	120			9,437
State Line	05244		1,180		605
Suicide	05323				4,830
Sullivan Canyon	04810				25,302
Sunshine	04863				17,522
Sunshine Tank	05247	80			7,140
Swapp Tank	05248				9,373
Temple Trail	05216	1,241	120		21,812
Toquer Tank	04861	640			11,785
Tuckup	00097	639			12,638
Valley Wash	05234	840			3,835
Wells	05208		640		5,490
White Pockets	05243				3,450
White Sage	05349	1,330			11,010
Whiterock-Soapstone	04804		42		18,388
Wildband	05223	4,620	260		37,451
Wolfhole - Canyon Sp	04811	2,560	160		33,757
Wolfhole Lake	04823		640		12,590
Wolfhole Mountain	04839				6,699
Yellowstone	05263	760	1,850		8,311
Summary for Arizona Strip FO (111 detail records)		128,279	53,240	166,454	1,432,937
Grand Total for Arizona Strip District		221,344	67,867	308,504	2,653,796

ALLOTMENT AUMs BY LAND STATUS

Allotment Name	Allotment Number	State AUMs	Private AUMs	Other Federal AUMs	Public AUMs
<i>Parashant</i>					
Belnap	4849	72	16		534
Belnap West	4822		23		204
Big Spring Pipeline	4870	216	16	689	1,721
Cottonwood	4809				1,867
Dripping Spring	4818			420	28
Duncan Tank	4820	120	282		429
Hidden Hills	4825	172			1,907
Hidden Spring	4803	48			1,256
Imlay	4817	36			734
Jump Canyon	4801	175			1,863
Last Chance	4815	94			609
Lime Spring	2012				Ephemeral
Link Spring	4819	42			1,094
Mosby	4835	48			81
Mosby-Nay	4836	96			1,148
Mt Trumbull	4826	187	80	445	1,113
Mt. Logan	5218	126			930
Mud And Cane Spring	4850	108			4,716
Mule Canyon	4821			433	152
Pakoon	4802	18			1,624
Pakoon Springs	4800	48	6		1,394
Parashaunt Amp	4829				2,308
Pa's Pocket	4848	62			479
Penns Well	4852	84	69		299
Red Pond	4806				2,793
Sullivan Tank	4816				456
Tassi	4851			0	0
Tuweep	5220	173			1,785
Wildcat	4854	288	575		4,593
Summary for Parashant (29 detail records)		2,213	1,070	1,987	36,117

ALLOTMENT AUMs BY LAND STATUS					
Allotment Name	Allotment Number	State AUMs	Private AUMs	Other Federal AUMs	Public AUMs
<i>Vermilion</i>					
Badger Creek	5341				93
Beanhole Well	5334	257			1,314
Bunting Well	4847	3,280			1,320
Coyote	5327	360			2,060
Ferry Swale	5336			849	828
House Rock	5331	105	17		1,755
Sand Hills	5328	1,320	24		15,081
Signature Rock	5350		52		382
Soap Creek	5332	386	25	78	6,867
Wahweap	5340			276	0
Summary for Vermilion (10 detail records)		5,708	118	1,203	29,700
<i>Arizona Strip FO</i>					
Antelope	5206	168	3		1,227
Antelope Spring	5210	240	67		1,157
Atkin Well	5207	35	397		2,339
Beaver Dam Slope	4828	21	7		897
Black Canyon	5256	72			243
Black Knolls	5264	240	28		1,338
Black Rock	4841				1,463
Blake Pond	4813	96	6		1,317
Brown-Shumway	5302				114
Button	5308	48	26		277
Canaan Gap	5205	97	248		279
Cane Beds	5212	171	105		324
Cedar Knoll	5318				720
Cedar Pockets Ut	4866				375
Cedar Ridge	5303				78
Cedar Wash	4842				333
Chatterly	5307	48	4		323
Clay Spring	4845				1,207
Clayhole	5215	1,516	64		10,082
Cottonwood	5209				312
Cowboy Butte	5310	41	32		184
Coyote Spring	4805	48			1,359
Crosby Tank	5219	72	150		470
Diamond Butte	4833	36	217		395

ALLOTMENT AUMs BY LAND STATUS

Allotment Name	Allotment Number	State AUMs	Private AUMs	Other Federal AUMs	Public AUMs
Fern Tank	5217	381	3		4,806
Ferrin	5246				120
Flat Top Well	5214	112			874
Franks Reservoir	5325				265
Fuller Road	5324	194			1,102
Glazier Dam	5202	211	58		571
Grama Point	5233	21			2,057
Gamma Spring	5225				360
Gulch	5230				96
Gunsight	5320				425
Hacks	5227	9			247
Harris Well	5238		604		272
Hat Knoll	4867				500
Head Of Hacks	5232	251			2,664
Herd House	96	12			95
Highway	4812	13			200
Highway	5309	266	181		429
Home Ranch	5342				6
Homestead	5253	253	485		654
Hurricane Cliff	5251	35			464
Hurricane Rim	114	109			3,424
Ivanpah	4858	168	75		601
Iverson	4834		306		64
Jackson Tank	4830				857
Jacob Canyon	5317	49			139
Joe	5245	515			24
Johnson Run	5330	107	17		253
June Tank	5221	525			8,206
Kanab Creek	5321	72			168
Kanab Gulch	5224				143
Lamb Tank	5257	84	61		423
Lambing-Starvation	4838	72			471
Lane	5271				54
Little Tank	4853	180			693
Little Wolf	4814				328
Littlefield	4843				120
Littlefield Comm.	4827	80	32		2,615
Lizard	4857	588			210
Loco Point	5260	51			535
Lost Spring Gap	5316				48
Lower Hurricane	4837		13		2,316
Mainstreet	4808	2,532	1,207		14,535

ALLOTMENT AUMs BY LAND STATUS					
Allotment Name	Allotment Number	State AUMs	Private AUMs	Other Federal AUMs	Public AUMs
Mesquite Community	4832			500	1,906
Moonshine	5237	42			824
Mormon Well	4844	82			420
Mountain Sheep	4824				96
Muggins Flat	5313	58			305
Mustang Spring	4859	72			491
Navajo Wells Ut	5348	44	16		376
Pat'S Pond	4862				60
Pigeon Tank	5322				299
Pipe Valley	5242	7			412
Pocum	4871				813
Pocum Tank	4840		9		494
Point Of Rock	5241	412	89		682
Pratt Tank	5314	108	68		800
Purgatory	4831				318
Quail Canyon	4856	6			808
Rider	5305	45			108
Rock Canyon	99	38	65		126
Rock Canyon Tank	5319	36			891
Rock Pockets	5213	346	3		1,760
Rock Reservoir	5345				22
Sage	5311	36			243
Scotties Seep	5236	70			710
Shinarump	5301	35			40
Short Creek	5270	234	314		252
Shuttleworth	5315	12			661
State Line	5244		156		29
Suicide	5323				280
Sullivan Canyon	4810				864
Sunshine	4863				1,440
Sunshine Tank	5247	8			752
Swapp Tank	5248				958
Temple Trail	5216	141	13		2,370
Toquer Tank	4861	103			1,801
Tuckup	97	60			792
Valley Wash	5234	96			328
Wells	5208		74		310
White Pockets	5243				420
White Sage	5349	49			429
Whiterock-Soapstone	4804				1,320
Wildband	5223	449	8		3,802
Wolfhole - Canyon Sp	4811	329			1,867

Wolfhole Lake	4823		40		928
Wolfhole Mountain	4839				315
Yellowstone	5263	218	174		897
Summary for Arizona Strip FO (111 detail records)		12,975	5,425	500	113,066
Grand Total of Arizona Strip District		20,896	6,613	3,690	178,883
Total Public AUMS for Arizona Strip					182,573

Mineral Potential on the Arizona Strip

Mineral Potential Definitions and Levels of Certainty are used to classify the likelihood mineral occurrences on public lands. The levels of mineral potential are classified as No Potential, Low Potential, Moderate Potential, High Potential and Not Determined. These levels are defined below:

- O No Potential: The geologic environment, the inferred geologic processes; and the lack of mineral occurrences do not indicate potential for accumulation of mineral resources.
- L Low Potential: The geologic environment and the inferred geologic processes indicate low potential for accumulation and preservation of mineral resources.
- M Moderate Potential: The geologic environment, the inferred geologic processes, and the reported occurrences or valid geochemical / geophysical anomaly indicate moderate potential for accumulation and preservation of mineral resources.
- H High Potential: The geologic environment, the inferred geologic processes, the reported mineral occurrences and/or valid geochemical/geophysical anomaly, and the known mines or deposits indicate high potential for accumulation of mineral resources. The “known mines and deposits” do not have to be within the area that is being classified, but have to be within the same type of geologic environment.
- ND Not Determined: Mineral(s) potential not determined due to lack of relevant data. The notation does not require a level-of-certainty qualifier.

The level of certainty is used to qualify the assigned mineral potential by describing the amount of data and evidence used in determining the assigned mineral potential. The categories for levels of certainty are given as A, B, C and D. These levels are defined below:

- A The available data are insufficient and/or cannot be considered as direct or indirect evidence to support or refute the possible existence of mineral resources within the respective area.
- B The available data provide indirect evidence to support or refute the possible existence of mineral resources.
- C The available data provide direct evidence but are quantitatively minimal to support or refute the possible existence of mineral resources.
- D The available data provide abundant direct and indirect evidence to support or refute the possible existence of mineral resources.

For determination of No Potential a certainty level of D is used. This class shall seldom be used, and when used it should be for a specific commodity only. For example, if the available data show that the surface and subsurface type of rock in the respective area is batholithic (igneous intrusive), one can conclude with reasonable certainty, the area does not have potential for coal.

As used in this classification, "potential" refers to potential for the presence (occurrence) of a concentration of one or more energy and/or mineral resources. It does not refer to or imply potential for development and/or extraction of the mineral resource(s). It does not imply that the potential concentration is or may be economic.

The level of potential and level of certainty for mineral resources in the Arizona Strip FO is shown in the Table 1 below.

Table 1. Mineral Resource Potential Ratings

Mineral Resource	Level of Potential	Level of Certainty
Coal	No Potential	D
Oil and Gas	Moderate Potential	C
Geothermal	Moderate Potential	B
Sodium	Moderate Potential	C
Potassium	Low Potential	C
Metallic Minerals	High Potential	D
Uranium	High Potential	D
Non-Metallic	High Potential	D
Common Varieties	High Potential	D

Potential for the Occurrence of Mineral Resources on the Arizona Strip

1. Coal

The geologic history and rock units preserved in the Arizona Strip FO are not conducive to the formation and preservation of coal resources. Therefore, there is no potential for the occurrence of this mineral resource. The certainty that coal does not exist is very high and has been assigned a certainty level of D.

2. Oil and Gas

Known oil and gas resources are not significant within the Arizona Strip FO and no economic occurrences of oil or gas have been encountered to date. However, the Arizona Strip FO has been only lightly explored for these resources with the vast majority of these wells drilled on the Colorado Plateau. To date (April 2002) a total of 64 wells were drilled on the , with an average of

one application for permit to drill received every two years for the last ten years. As of February 2002 there are approximately 66,815 acres leased and 24,033 pending lease for oil and gas on BLM land in the .

Ryder (1983) rated the oil and gas potential of the Arizona Strip FO as moderate in the north-central and extreme western portions. This rating was based on several oil shows reported from wells drilled in the area and the location of the tracts in relation to the Paleozoic hinge line. In the case of the moderate potential in the north-central area, consideration was also given to that area's location in relation to the Virgin oil field in southwest Utah. In both areas, Ryder speculated that any hydrocarbons present would have migrated into the area from the Rocky Mountain Geosyncline lying to the west. Heylman (1987) rated the Arizona Strip FO as having good potential for oil accumulations in northwest-striking, anticlinal folds and other structural traps located away from major fault zones. Good potential was also assigned to the Shnabkaib member of the Moenkopi Formation and the Toroweap Formation where stratigraphic traps may exist. Reynolds and others (1988) recognized the Proterozoic Chuar group as a potential source rock for hydrocarbons in northern Arizona. Thus, it would appear that the many thousands of feet of marine sediment that lie in and immediately adjacent to the Arizona Strip FO to the west could provide at least a moderate potential for the origination and possible migration of hydrocarbons into the area. Rauzi (1990) associates oil and gas potential on the Arizona Strip FO with Cordilleran shelf deposits and considers the truncated Cambrian and Ordovician units in the westernmost part of the Arizona Strip FO and the common facies changes from carbonate to clastic beds as favorable for stratigraphic and structural accumulations of oil and gas.

Those areas identified by Ryder (1983) as having moderate potential for hydrocarbon accumulations are carried forth here. Oil and gas accumulations which could underlie the probably occur in structural or stratigraphic traps within rocks of upper Proterozoic through upper Paleozoic ages. The certainty of oil and gas in this area is supported by direct evidence in the form of oil and gas shows in wells. However, the evidence does not support or refute the existence of a valuable resource and is assigned a certainty level of C.

Tertiary and Quaternary erosion along the major drainages crossing most of the southern and eastern portion of the would tend to lower the potential for the preservation of hydrocarbon accumulations due to probable groundwater flushing and is rated as having low potential. In this area only indirect evidence indicates a possibility that oil and gas may not exist. Thus, most of the southern and eastern portion of the is rated as having a low potential on this basis. The certainty that oil and gas resources do not exist in this area is supported only by indirect evidence and, therefore, is assigned a certainty level of B.

3. Geothermal

No geothermal leases have been issued on the . Extensive exploration for geothermal resources in the Arizona Strip FO has not occurred, though warm springs and wells occur in the area. These occurrences and springs do not lie in areas of identified anomalous geothermal regions

(Giardina and Conley, 1978). Due to the lack of indicated geothermal anomalies in the vicinity of the Arizona Strip FO, the warm water occurrences are probably related to the deep circulation of ground water along fault zones. The geothermal resources in these areas are thus expected to be limited in extent and quality. They are very low temperature and not presently usable for purposes other than space heating. This use requires the point use to be located in close proximity to the heat source. Given the lack of population centers in close proximity to these occurrences, these springs and wells have no immediate potential for space heating applications.

The Arizona Strip FO is moderately favorable for the occurrence of low temperature geothermal resources, particularly along major fault zones. The certainty that these resources exist is supported by only indirect evidence in the form of geologic inference. It has therefore been assigned a certainty level of B.

4. Sodium and Potassium

No solid mineral leases have been issued on the Arizona Strip FO. Sodium deposits have been reported from the Muddy Creek Formation near Mesquite, Nevada and are contained within small isolated playa deposits (Wilson and Roseveare, 1949). Though information of a quantitative nature is lacking, this area has been classified as potentially valuable for sodium. Other than reconnaissance work, no activity is known to have occurred for the exploration or development of the sodium resource. Based on the reported occurrence of sodium within the Muddy Creek Formation in this area, the area covered by the Muddy Creek Formation has been assigned a moderate potential for that occurrence. The available data provide direct evidence but are quantitatively minimal to support the possible existence of a sodium mineral resource and the area has been assigned a certainty level of C.

The geologic history and rock units preserved in the Arizona Strip FO are not conducive to the formation and preservation of potassium resources. Therefore, there is low potential for the occurrence of this mineral resource. The available data provide quantitatively minimal direct evidence to support or refute the possible existence of potassium and has been assigned a certainty level of C.

5. Metallic Minerals

In general, the occurrences of metallic minerals in the Arizona Strip FO are related to three main types of mineralizing processes which include: epithermal precious and base metal deposits associated with normal, thrust and detachment faults in the Basin and Range province, such as carbonate-hosted gold deposits; collapse structures, commonly referred to as breccia pipes, which are polymetallic as a group and on the Arizona Strip FO host economically important uranium deposits; and stratabound deposits, containing uranium, copper and gold. Residual placer gold deposits result from the erosion of auriferous rocks.

a. Carbonate Hosted Gold

Carbonate hosted gold shows a moderate potential for occurrence in the Virgin Mountains. Any gold mineralization present would be of the bulk-tonnage, low-grade type described by Berger (1986) and Fisher and Juilland (1986). Mineralization would be associated with normal, thrust, and possibly detachment faults in the area. Small deposits and anomalies of tungsten, copper, silver, arsenic, molybdenum, lead, and zinc have been identified in the area (Villalobos and Ham, 1981). These elements were identified by Berger (1986) as being either pathfinder elements or elements occurring in small deposits in the vicinity of gold mineralization. Due to the indirect evidence available, the level of certainty that deposits of this nature exist is assigned Level B.

b. Placer Gold

Placer gold deposits reportedly occur along the lower western slope of the Beaver Dam and Virgin Mountains. Based on the geologic environment, the inferred geologic processes, and reported occurrence of gold, the alluvial material along Beaver Dam Wash shows a moderate potential for the occurrence of gold. Available data provide direct evidence but are quantitatively minimal to support the existence of a mineral resource of this type in this area and is therefore assigned a certainty level of C.

c. Breccia Pipe Related

Breccia pipe deposits containing precious and base metal occur along the lower Grand Wash Cliffs and eastern slope of the Virgin Mountains. These deposits reportedly contain copper (up to 23 percent), silver (up to 10 ounces per ton), and relatively minor amounts of lead, zinc, uranium, and gold (Keith and others, 1983). Germanium and Gallium occur in the Apex deposit in Utah (Bernstein, 1986). These two elements reportedly occur in breccia pipes occurring along the Lower Grand Wash Cliffs (Winston, 1988). Based on the known deposits of this nature, the Lower Grand Wash Cliffs area and eastern slope of the Virgin Mountains are rated as having a high potential for the occurrence of breccia pipe related metallic mineral resources. The level of certainty that these deposits exist is supported by abundant direct and indirect evidence and assigned a certainty level of D.

6. Uranium

Favorable environments for the occurrence of uranium minerals within the Arizona Strip FO include breccia pipe related uranium deposits and sandstone type uranium deposits. Breccia pipes originate in fractured Redwall Limestone and form collapse features in overlying rocks as recent as the Chinle Formation. Uranium mineralization occurs in the Supai through Toroweap formations (Krewedl and Carisey, 1986). Exploration and development operations for uranium deposits were very active on the Arizona Strip FO during the 1980s up through the mid-1990s.

These activities resulted in the discovery of eighteen uranium deposits and the construction of six uranium mines (Hack Canyon Mine, Hermit Mine, Pigeon Mine, Arizona 1 Mine, Pinenut Mine and Kanab North Mine). The mines were developed in breccia pipes found near Kanab Creek and its tributaries. The total production from these mines was 9,600 tons of U_3O_8 and the proven reserves in the remaining deposits are estimated at 12,250 tones of U_3O_8 (Smith, R., personal communication, April 2002). Most of the developed deposits contained copper and silver, in addition to uranium. In the 1980s the price of uranium fell dramatically negatively affecting the economics of uranium mining. Currently three of the mines (Arizona 1 Mine, Pinenut Mine and Kanab North Mine) are undergoing care and maintenance in "stand by" mode and the other three mines have been closed and reclaimed. Generally, the reclaimed mines have responded very well to reclamation efforts undertaken. Through 1990, when production was suspended, uranium output from the Arizona Strip FO has totaled 23.3 million pounds of U_3O_8 with an average grade of about 0.60% U_3O_8 (McMurray, 1996?).

Sandstone type uranium deposits occur in the Petrified Forest and Shinarump members of the Chinle Formation. These deposits typically occur in medium to coarse grained sandstones and conglomerates deposited along ancient stream channels, Uranium mineralization is associated with carbonaceous material contained within the sandstone and conglomerates. Uranium was produced from sandstone type deposits in the 1950s (Keith et al., 1983; Scarborough, 1981; Baillieu and Zollinger, 1980). Approximately 1,524 tons of uranium ore averaging 0.201% U_3O_8 was produced from the Vermillion Cliffs deposits between 1954 and 1957 (Scarborough, 1981). These deposits are located within the present day Vermillion Cliffs National Monument. Uranium was produced from similar deposits in the Rainbow Hills mining district though no production figures are available.

Based on the geologic environment, known deposits and mines in these areas there is a high potential for the occurrence of uranium resources. The level of certainty that these deposits exist is supported by abundant direct and indirect evidence and assigned a certainty level of D.

7. Gypsum

On the Arizona Strip FO, potentially favorable environments for the occurrence of gypsum include sabkha environments associated with marine regressions in rocks of Permian and Triassic age. Large gypsum deposits occur in the northwestern portion of the Arizona Strip FO. These deposits occur in the upper portion of the Pakoon Dolomite (Hintze, 1986), the Harrisburg Member of the Kaibab Formation (Nielson, 1986; Cheevers and Rawson, 1979), and the Lower Red Member of the Moenkopi Formation (Hintze, 1986; Nielson, 1986; Moore, 1972).

Gypsum occurring in the Pakoon Dolomite, known as the Cedar Pocket deposit, has been assayed by the U.S. Bureau of Mines and the BLM, it found to be of good quality, being relatively pure and free of acid insoluble residue and suitable for cement, agricultural, filler, wallboard, and food and pharmaceutical markets. A mining claim validity examination was conducted by the BLM on the Cedar Pocket deposit. A reserve estimate was made containing approximately 32.5

million tons of gypsum (Kershaw, 1994) and 40 acres patented. This deposit has been mined intermittently, presently the mine is inactive.

Near Black Rock Gulch gypsum occurrences are wide spread and several mines have been developed in the Harrisburg member of the Kaibab Formation. Commercial production has been established at three mines Snowflake, Gypsum City and Domtar Ridge near Black Rock Gulch. Initial production during mine start-up in 1990 was approximately 7,000 tons of gypsum. The annual production in 2001 was approximately 700,000 tons of gypsum, while the total production from these mines is approximately 5 million tons of gypsum (Cercala, D., personal communication, May 2002). The Snowflake and Gypsum City operations were mined out and have been reclaimed. The initial reserve estimate for the Domtar Ridge Mine was approximately 93 million tons and inferred resources may be as high as 5 billion tons (Cercala, D., personal communication, 1997). The principal uses for this commodity include manufacturing wall board and portland cement, other uses include agricultural, pharmaceutical, feed grade, food processing and mineral additives. The predicted trend is an increase in production for both the near future and the long term.

Based on the known occurrence of gypsum in these formations and the developed mines, areas where the Toroweap, Kaibab and Moenkopi formations are exposed have been assigned a high potential for the occurrence of gypsum. The gypsum deposit in the Pakoon Dolomite appears to be an isolated occurrence in the Cedar Pockets area and, as such, the Pakoon Dolomite in the Cedar Pockets area has high potential for the occurrence of gypsum. The level of certainty that these deposits exist is supported by abundant direct and indirect evidence and assigned a certainty level of D.

8. Common Variety Materials

Common variety minerals are important in construction and to collectors. These minerals include sand, gravel, cinders, building stone, petrified wood, etc. These commodities occur in various locales throughout the Arizona Strip FO. Development of construction materials depends, to a large extent, upon the location of construction projects or population centers. Petrified wood may be sought after wherever it is found as it is generally collected as a hobby or sold by commercial enterprises as specimens. Potentially favorable environments for the occurrence of common variety include Permian through Quaternary sedimentary and volcanic rocks.

a. Sand and Gravel

In the western portion of the Arizona Strip FO, gravel is abundant along the lower portions of the western slopes of the Virgin and Beaver Dam Mountains. Here alluvial fans have formed and the gravel is expected to be unsorted but of good quality.

Gravel in this area is also occurs along the Beaver Dam Wash and the Virgin River. Well sorted good quality gravel is expected in the stream channels and along stream terraces that have

formed along both sides of the channels. Based on the surface exposures of gravel in these environments, these areas are assigned a high favorability for the occurrence of gravel with a certainty level of D.

Sand and gravel resources, in significant accumulations, are relatively scarce in the central portion of the Arizona Strip FO. Large deposits are confined to isolated exposures of gravel in lower portions of the Moenkopi Formation, for example both Cedar Knoll and Little Cedar Knoll are these types. These deposits, though few, contain substantial quantities of good quality gravel. The remainder of the central portion of the Arizona Strip FO is relatively gravel-poor. Good quality gravel is confined to exposures of the Shinarump Member of the Chinle Formation, and Quaternary aged ephemeral stream channels cut into the Kaibab Formation. Quaternary aged alluvial fan deposits formed along the western slope of the Hurricane Cliffs. Examples of deposits developed in these environments include the Yellowstone Mesa community pit in the Shinarump Member and a stream channel deposit west of Hack Reservoir. Gravel deposits within the Shinarump Member may be cemented and drilling, blasting or ripping may be required to develop the gravel resources in some areas. Gravel that occurs in Quaternary stream channel deposit would probably be confined to a relatively narrow zone, averaging approx. 75 feet in width. Gravel from alluvial fans on the western slope of the Hurricane Cliffs provides a significant source of gravel just north of the Arizona Strip FO in Utah. This same environment could contain significant gravel resources in Arizona. Based on the known occurrence of gravel in these environments, these areas have been assigned a high potential for occurrence. The certainty that gravel exists in these areas is high and assigned a certainty level of D.

In the extreme eastern portion of the Arizona Strip FO, gravel is again relatively scarce. In the House Rock-Valley area the Shinarump Member of the Chinle may contain good quality gravel in large quantities. However, accessible exposures of this unit are rare and gravel from this unit should not be counted on for a long term source. Recent gravel deposits of large quantity and relatively good quality have formed at the bottom of the western slope of the Kaibab monocline. Gravel in these deposits is expected to be relatively poorly sorted with sizes ranging from boulder to sand. In addition to these two types of deposits, the potential also exists for stream channel gravels to occur on exposures of the Kaibab Formation. Deposits of this nature would be similar to those described above in the central portion of the Arizona Strip FO. Based on the physical exposures of gravel from these environments in the House Rock Valley area, they have been assigned a high potential for the occurrence of gravel with a certainty level of D.

b. Building Stone

Building stone occurs throughout the Arizona Strip FO. Local demand is expected to be met by the existing sites established for this use. Due to the widespread occurrence of this commodity no attempt has been made to classify areas of high potential.

c. Cinders

Arizona Strip Oil and Gas Wells

Cinders are known to occur in the immediate vicinity of some of the volcanic centers on the Shivwits and Uinkaret plateaus. Only those deposits identified under occurrences, however, have been designated as high potential, with a certainty level of D.

Well ID	County	Section	Township	Range	Occurrence Name	Potential
100	Coconino	17	36N	10E	...	...
101	Coconino	17	36N	10E	...	...
102	Coconino	17	36N	10E	...	...
103	Coconino	17	36N	10E	...	...
104	Coconino	17	36N	10E	...	...
105	Coconino	17	36N	10E	...	...
106	Coconino	17	36N	10E	...	...
107	Coconino	17	36N	10E	...	...
108	Coconino	17	36N	10E	...	...
109	Coconino	17	36N	10E	...	...
110	Coconino	17	36N	10E	...	...
111	Coconino	17	36N	10E	...	...
112	Coconino	17	36N	10E	...	...
113	Coconino	17	36N	10E	...	...
114	Coconino	17	36N	10E	...	...
115	Coconino	17	36N	10E	...	...
116	Coconino	17	36N	10E	...	...
117	Coconino	17	36N	10E	...	...
118	Coconino	17	36N	10E	...	...
119	Coconino	17	36N	10E	...	...
120	Coconino	17	36N	10E	...	...
121	Coconino	17	36N	10E	...	...
122	Coconino	17	36N	10E	...	...
123	Coconino	17	36N	10E	...	...
124	Coconino	17	36N	10E	...	...
125	Coconino	17	36N	10E	...	...
126	Coconino	17	36N	10E	...	...
127	Coconino	17	36N	10E	...	...
128	Coconino	17	36N	10E	...	...
129	Coconino	17	36N	10E	...	...
130	Coconino	17	36N	10E	...	...
131	Coconino	17	36N	10E	...	...
132	Coconino	17	36N	10E	...	...
133	Coconino	17	36N	10E	...	...
134	Coconino	17	36N	10E	...	...
135	Coconino	17	36N	10E	...	...
136	Coconino	17	36N	10E	...	...
137	Coconino	17	36N	10E	...	...
138	Coconino	17	36N	10E	...	...
139	Coconino	17	36N	10E	...	...
140	Coconino	17	36N	10E	...	...
141	Coconino	17	36N	10E	...	...
142	Coconino	17	36N	10E	...	...
143	Coconino	17	36N	10E	...	...
144	Coconino	17	36N	10E	...	...
145	Coconino	17	36N	10E	...	...
146	Coconino	17	36N	10E	...	...
147	Coconino	17	36N	10E	...	...
148	Coconino	17	36N	10E	...	...
149	Coconino	17	36N	10E	...	...
150	Coconino	17	36N	10E	...	...

APPENDIX 3.G

ARIZONA STRIP OIL AND GAS WELLS

A. Field Name

Field Name: [Faint text describing the field name and location]

Arizona Strip Oil and Gas Wells

Township	Range	Section	¼¼Sec.	TD	Lowest Fm. Penetrated	Reported Oil Shows
36N	09W	30	NESW	5961	Precambrian granite	Minor show
37N	09W	18	SESE	3560		Show reported
37N	12W	15	SESE	5000		
38N	05W	31	NWSE	4666	Cambrian Bright Angel Sh.	Temple Butte Fm.
38N	07W	17	NWSW	32		
38N	07W	17	SWSW	460	Permian Toroweap	Show reported
38N	07W	17	SWSW	1780	Permian Hermit Shale	Coconino Ss.
38N	07W	29	NWNE	1115	Permian Hermit Shale	No show
38N	10W	17	SWNE	3125	Pennsylvanian Callville	Minor show
39N	02E	32	NENE	3868	Cambrian Bright Angel Sh.	No show
39N	05W	10	NWNE	1600	Permian Toroweap "	Moenkopi, Kaibab
39N	06W	14	SWNW	2303	Permian Coconino Ss.	Several shows
39N	06W	35	SESW	1820	Permian Toroweap	Toroweap Fm.
39N	07W	2	NESE	4031	Mississippian	Minor show CO2, He
39N	13W	35	SESW	4015	Mississippian	Minor show
40N	02E	21	SESE	4016	Cambrian Muave	No show
40N	02E	25				
40N	06W	12	NWSW	2202	Permian Kaibab	Minor show
40N	06W	26	NWNW	7070	Cambrian Tapeats Ss.	Moenkopi, Toroweap
40N	06W	26	NWNW	595	Triassic Moenkopi	
40N	06W	27	NENE	2500	Permian Hermit Shale	Moenkopi good show
40N	08W	28	SESW	120		
40N	08W	28	SESW	3753	Mississippian	
40N	09W	18	NESW	4509	Devonian	Minor show
41N	01E	19	SWNW	420	Permian Kaibab	
41N	01E	19	SWNW	620	Permian Kaibab	
41N	01E	19	SWNW	3756	Cambrian Muave	
41N	01W	22				
41N	01W	23	NWSE	550	Permian Kaibab	
41N	01W	24	SENE	4760		
41N	01W	24	NWSE	900		
41N	01W	24	NWSE	500	Permian Kaibab	
41N	01W	24	NESW	750	Permian	
41N	01W	24	NESW	480	Permian Kaibab	
41N	01W	24	NENW	540	Permian Kaibab	
41N	01W	24	NWSE	491	Permian Kaibab	
41N	01W	24	NWSE	470		
41N	01W	24	NWSE	482	Permian Kaibab	
41N	01W	24	NWSE	900		
41N	01W	24				
41N	02E	13	SENE	700	Permian Hermit	No Show
41N	06W	16	SESE	542		Inadequate test
41N	08W	18	NENW	1522		Minor show
41N	09W	28	NWSE	4150	Mississippian	Pakoon Fm.
41N	09W	33	NWNW	3430	Mississippian	Minor show
41N	11W	3				
41N	11W	10	NENW			
41N	11W	10	NESE	1500		

41N	12W	23	NENE	1980
41N	15W	29	NWSE	2600
41N	16W	16	SWNE	900
42N	08W	31	SWSW	936
42N	11W	35	NESW	1432
42N	15W	32	SW?	1405
42N	15W	32	SE	545

APPENDIX 3.H

RECREATION OPPORTUNITY SPECTRUM

Recreation Opportunity Spectrum (ROS) Criteria for Chapter 3 Classification & Chapter 2 Prescriptions

The following tables describes the recreation setting character conditions required to produce recreation opportunities and facilitate the attainment of both recreation experiences and beneficial outcomes, as targeted in Special Recreation Management Areas in Chapter 2. This characterization of settings is used for both describing existing setting character (Chapter 3) and prescribing desired setting character (Chapter 2). Indicators and standards for monitoring setting conditions would be derived and/or developed from the a. through i. components in the tables.

PHYSICAL – Resources & Facilities: Character of the natural landscape				
Primitive	Semi-Primitive Non-Motorized	Semi-Primitive Motorized	Roaded Natural	Urban
OVERALL PHYSICAL CHARACTERISTICS				
Area is characterized by essentially unmodified natural environment of fairly large size.	Area is characterized by predominantly natural or natural-appearing environment of moderate to large size.	Area is characterized by predominantly natural or natural-appearing environment of moderate to large size.	Area is characterized by predominantly natural-appearing environment with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Resource modification and utilization practices are evident, but harmonize with the natural environment.	Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans, on-site, are predominant.
a. Remoteness				
>3 miles from any road	>½ mile from any kind of road, but not as distant as 3 miles, and no road is in sight	On or near 4WD roads, but at least ½ mile from all improved roads, though they may not be in sight	On or near improved country roads, but at least ½ mile from all highways	On or near primary highways, municipal streets, and roads within towns or cities
b. Naturalness				
Undisturbed natural landscape	Naturally-appearing landscape having modifications not readily noticeable	Naturally-appearing landscape except for obvious primitive roads	Landscape partially modified by roads, utility lines, etc., but none overpower natural landscape features	Urbanized developments dominate this landscape
c. Facilities				
None	Some primitive trails made of native materials such as log bridges and carved wooden signs	Maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets	Improved yet modest, rustic facilities such as campgrounds, restrooms, trails, and interpretive signs	Elaborate full-service facilities such as laundry, groceries, and book stores

SOCIAL – Visitor Use & Users: Character of recreation & tourism use				
Primitive	Semi-Primitive Non-Motorized	Semi-Primitive Motorized	Roaded Natural	Urban
OVERALL SOCIAL CHARACTERISTICS				
Interaction between users is very low and evidence of other users is minimal.	Interaction between users is low, but there is often evidence of other users.	Concentration of users is low, but there is often evidence of other users.	Interaction between users may be low to moderate, but with evidence of other users prevalent.	Large numbers of users can be expected, both on-site and in nearby areas.
d. Group Size (other than your own)				
Fewer than or equal to 3 people per group	4-6 people per group	7-12 people per group	13-25 people per group	Greater than 50 people per group
e. Contacts (w/other groups)				
Fewer than 3 encounters per day at campsites and fewer than 6 encounters per day on travel routes	3-6 encounters/day off travel routes(e.g., campsites) and 7-15 encounters/day on travel routes	7-14 encounters/day off travel routes(e.g., staging areas) and 15-19 encounters/day en route	15-19 encounters/day off travel routes(e.g., campgrounds) and 30 or more encounters/day en route	Other people consistently in view
f. Evidence of Use				
Only footprints may be observed	Footprints plus slight vegetation trampling at campsites & travel routes. Only infrequent litter	Vehicle tracks and occasional litter and soil erosion. Vegetation becoming worn	Well-worn soils and vegetation, but often gravel surfaced for erosion control. Litter may be frequent	A busy place with what seems like constant noise. Unavoidable litter seems to be a lifestyle choice

ADMINISTRATIVE – Administrative & Service Setting: How public land managers, county commissioners and municipal governments, and local businesses care for the area and serve visitors and local residents					
Primitive	Semi-Primitive Non-Motorized	Semi-Primitive Motorized	Roaded Natural	Rural	Urban
OVERALL ADMINISTRATIVE CHARACTERISTICS					
The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.	The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is not permitted.	The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is permitted.	Conventional motorized use is provided for in construction standards and design of facilities.	A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided far away from developed facilities. Facilities for intensified motorized use and parking are available.	Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.
g. Visitor Services					
None is available on-site	Basic maps, but area personnel seldom available to provide on-site assistance	Area brochures and maps, plus area personnel occasionally present to provide on-site assistance	Information materials describe recreation areas and activities. Area personnel are periodically available	Everything described to the left in this row, and describe experiences and benefits available. Area personnel do on-site education	Everything described to the left in this row, plus regularly scheduled on-site outdoor skills demonstrations and clinics
h. Management Controls					
No visitor controls apparent. No use limits. Enforcement presence very rare.	Signs at key access points on basic user ethics. May have back country use restrictions. Enforcement presence rare	Occasional regulatory signing. Motorized and mechanized use restrictions. Random enforcement presence	Rules clearly posted with some seasonal or day-of-week use restrictions. Periodic enforcement presence	Regulations prominent. Total use limited by permit, reservation, etc. Routine enforcement presence	Continuous enforcement to redistribute use and reduce user conflicts, hazards, and resource damage
i. Mechanized Use					
None whatsoever	Mountain bikes and perhaps other mechanized use, but all is non-motorized	4WD, ATV, dirt bikes, or snowmobiles in addition to non-motorized, mechanized use	2WD vehicles predominant, but also 4WD and non-motorized, mechanized use	Ordinary highway auto and truck traffic is characteristic	Wide variety of street vehicle and highway traffic is ever-present

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SOCIOECONOMICS

OVERVIEW

The Planning Area encompasses northern portions of Coconino and Mohave Counties in Arizona. Due to the size of the Planning Area and its influence on neighboring states, counties, and communities, the socioeconomic study area also includes southern Washington and Kane counties, Utah, and extreme southeastern Clark and Lincoln counties, Nevada. Sixteen individual communities or community groupings reside within the study area. These communities and counties are described in this section according to their population, economy, employment, and economic characteristics.

Unless otherwise stated, data used in the socioeconomic affected environment were obtained from the U.S. Census, either directly (2000 numbers) or from longitudinal analysis prepared by the Sonoran Institute. While more up-to-date data are available (e.g., population estimates for 2003), such data are not consistent as they may be available for some counties and communities, but not others, and are based on estimates instead of actual census numbers. Using the census data allows greater reliability in comparisons between communities within the study area, as well as comparisons with state and national figures.

In general, the study area is sparsely populated but has an exceptional growth rate. When combined, the 16 communities/community groupings, which span three states and five counties, have a total population of 104,687. Almost half of this number lives in one city, St. George, Utah. Thirteen of the communities experienced an average population increase of 75.1 percent over the ten-year period between 1990 and 2000, which is remarkable when compared to the national average increase of 11.6 percent over the same period. Population data for 1990 is not available for three of the communities in the study area. Population data for the study area, states, and the nation are provided in Table 1. Longer trends in population growth are provided for each county in the study area on the following pages.

The 16 communities/community groupings in the study area had a combined civilian labor force of 45,512 in 2000. Unemployment rates were higher than the national average of 3.7 percent in some parts of the study area. For example, the unemployment rate for Coconino County, Arizona was 4.8 percent (compared to the state average rate of 3.4 percent), and was as high as 5.2 percent in the town of Fredonia. Although the unemployment rate for Mohave County, Arizona was the same as the national rate, some towns within the study area had much higher rates, ranging up to 7.9 percent in the Virgin River communities. Rates were lower than the national average in both Kane and Washington Counties, Utah, with rates as low as 1.3 percent in the town of Hildale, and 2.1 percent in Santa Clara. More detail is available in Table 2. Per capita income for most communities was several thousand dollars lower than the national average. These and other economic statistics are also presented in Table 2

Employment by occupation is shown in Table 3, and is shown over time for individual counties in the pages that follow. The study area is diverse in terms of employment opportunities, with no single occupation dominating the whole area. However, in all study areas, the vast majority of economic growth has been in the services and professional sector, along with more moderate growth in the government and construction sectors. Traditional sources of employment, such as agriculture, have grown more slowly or not at all. Although a few communities are dependent on lower-wage, often tourism-related service jobs such as those in the arts, entertainment, recreation, accommodation, and food services industry, in most of the counties within the study area the majority of growth has taken place in higher-paid components of the services sector, such as the professional, managerial, health and education areas. Table 4 shows employment by industry for the study area.

In order to ensure that the communities in the Planning Area are able to attract higher-paying jobs in “knowledge-based” areas of the service sector, attention should be paid to the level of educational attainment. As Table 5 demonstrates, the communities and counties within the study area vary in terms of educational attainment. Coconino County appears to have the greatest percent of individuals with at least a bachelor’s degree (30 percent compared to the nation’s 24.4 percent), although the communities within the Coconino County portion of the study area do not show this trend. Mohave County has the least percent of individuals with at least a bachelor’s degree (10 percent), with Colorado City only having 5.1 percent of its population with at least a bachelor’s degree and the highest percent (29.4) of individuals with less than high school education, higher than any other community or county in the study area.

In addition to employment figures, it is important to consider sources of income in the Planning area. Doing so reveals that the largest source of income for most of the counties is actually non-labor (income from investments, retirement, social security, etc.). The service and professional segment of the economy is also growing rapidly in most areas, as is evident in the county graphs on the following pages.

The prevalence of non-labor income has important implications for the management of public lands. Much of the income in this sector is brought by individuals who are not tied to a specific job or industry, but rather have flexibility in where they choose to live. Examples of people contributing this type of income include retirees, second and vacation homeowners, and “footloose” entrepreneurs in knowledge-based industries who depend on telecommunications more than location to accomplish their jobs. These groups tend to be attracted to rural areas by the small-town atmosphere and slower pace of life, the lower cost of living, and by the presence of public lands, which offer recreational opportunities and a desirable setting in which to live.

Table 1: Population of cities/towns in the Study Area

	U.S Census Data		% change 1990-2000	Projections					
	1990	2000		2010	% change 2000-2010	2020	% change 2010-2020	2030	% change 2020-2030
UNITED STATES	248,709,873	281,421,906	11.6	--	--	--	--	--	--
Arizona	3,665,228	5,130,632	40.0	6,145,108	19.8	7,363,604	19.8	8,621,114	17.1
Cocoonino County	96,591	116,320	20.4	147,352	26.7	169,343	14.9	189,868	12.1
Fredonia	1,207	1,036	-14.1	1,507	45.5	1,671	10.9	1,811	8.4
Page	6,598	6,809	3.1	11,128	63.4	13,057	17.3	14,841	13.7
Mohave County	93,497	155,032	65.8	194,403	25.4	236,396	21.6	270,785	14.5
Colorado City	2,426	3,334	37.4	5,500	65.0	6,626	20.5	7,598	14.7
Kaibab CDP	--	275	--	--	--	--	--	--	--
Kaibab Paiute Tribe	165	196	18.8	--	--	--	--	--	--
Virgin River Comm.	--	1,531	--	--	--	--	--	--	--
Utah	1,722,850	2,275,861	32.1	--	--	--	--	--	--
Kane County	5,169	6,046	17.0	8,238	36.3	11,243	36.5	14,924	32.7
Big Water	326	417	27.9	539	29.3	736	36.5	977	32.7
Kanab	3,289	3,564	8.4	5,849	64.1	7,983	36.5	10,596	32.7
Washington County	48,560	90,354	86.1	122,272	35.3	165,346	35.2	218,198	32.0
Hildale	1,325	1,895	43.0	3,343	76.4	4,521	35.2	5,965	32.0
Hurricane	3,915	8,250	110.7	10,711	29.8	14,484	35.2	19,113	32.0
Ivins	1,630	4,450	173	6,431	44.5	8,697	35.2	11,477	32.0
St. George	28,502	49,663	74.2	68,773	38.5	93,000	35.2	122,727	32.0
Santa Clara	2,322	4,630	99.4	6,562	41.7	8,874	35.2	11,710	32.0
Washington	4,198	8,186	95	10,283	25.6	13,906	35.2	18,351	32.0
Nevada	1,201,833	1,998,257	66.3	--	--	--	--	--	--
Clark County	741,459	1,375,765	85.5	1,827,770	32.9	--	--	--	--
Bunkerville CDP	--	1,014	--	--	--	--	--	--	--
Mesquite	1,871	9,389	401.8	21,000 ¹	123.7	--	--	--	--
Lincoln County	3,775	4,165	10.3	4,280	2.8	--	--	--	--

CDP = Census Designated Place; "--" = No Data Available

Data Sources: U.S. Census Bureau – all 1990 and 2000 numbers; Arizona Dept. of Economic Security, Research Administration – all Arizona projections; Five County Association of Governments – all Utah projections; Department of Cultural Affairs – Nevada county projections; City of Mesquite – Mesquite projections (¹ 2008 estimate)

Table 2: Labor, Unemployment, Income, and Household/Family Size in the Study Area

	Population	Civilian labor force	Un-employment Rate	Per Capita Income	Family Income	Household Income	Household Size	Family Size
UNITED STATES	281,421,906	137,668,798	3.7	21,587	50,046	41,994	2.59	3.14
Arizona	5,130,632	2,366,372	3.4	20,275	46,723	40,558	2.64	3.18
<i>Coconino County</i>	116,320	59,647	4.8	17,139	45,873	38,256	2.80	3.36
Fredonia	1,036	433	5.2	13,309	30,913	30,288	2.89	3.25
Page	6,809	3,617	4.4	18,691	54,323	46,935	2.90	3.33
<i>Mohave County</i>	155,032	65,048	3.7	16,788	36,311	31,521	2.45	2.87
Colorado City	3,334	917	2.7	5,293	32,344	32,826	7.51	7.58
Kaibab CDP	275	120	6.2	9,421	22,679	21,458	3.13	3.53
Kaibab Paiute Tribe	196	109	6.8	7,951	21,250	20,000	3.02	3.49
Virgin River Com.	1,531	762	7.9	14,201	34,878	31,202	2.65	3.12
Utah	2,233,169	1,098,923	3.4	18,185	51,022	45,726	3.13	3.57
<i>Kane County</i>	6,046	2,816	3.3	15,455	40,030	34,247	2.67	3.21
Big Water	417	244	3.7	15,026	37,917	30,278	2.44	2.97
Kanab	3,564	1,568	2.5	16,128	40,778	35,125	2.64	3.17
<i>Washington County</i>	90,354	37,711	3.2	15,873	41,845	37,212	2.97	3.36
Hildale	1,895	466	1.3	4,782	31,750	32,679	8.17	8.10
Hurricane	8,250	3,372	3.3	13,353	36,955	32,865	2.97	3.38
Ivins	4,450	1,946	2.8	16,743	43,103	41,297	3.10	3.35
St. George	49,663	21,442	3.5	17,022	41,788	36,505	2.81	3.21
Santa Clara	4,630	3,019	2.1	15,957	55,000	52,770	3.78	3.96
Washington	8,186	3,137	2.4	14,032	39,003	35,341	3.00	3.37
Nevada	1,998,257	995,200	4.0	21,989	50,849	44,581	2.62	3.14
<i>Clark County</i>	1,375,765	682,073	4.2	21,785	50,485	44,616	2.65	3.17
Bunkerville CDP	1,014	479	4.3	16,820	46,098	45,076	3.93	4.27
Mesquite	9,389	3,990	3.6	20,191	42,941	40,392	2.66	3.08
<i>Lincoln County</i>	4,165	1,538	2.5	17,326	45,588	31,979	2.48	3.15

Table 3: Employment by Occupation in the Study Area

	Management, and professional, and related occupations		Service occupations		Sales and office occupations		Farming, fishing, and forestry occupations		Construction, and extraction, and maintenance occupations		Production, and transportation, and material moving occupations	
	#	%	#	%	#	%	#	%	#	%	#	%
UNITED STATES	43,646,731	33.6	19,276,947	14.9	34,621,390	26.7	951,810	0.7	12,256,138	9.4	18,968,496	14.6
Arizona	730,001	32.7	362,547	16.2	636,970	28.5	13,839	0.6	245,578	11.0	244,015	10.9
<i>Cocoino County</i>	19,309	34.8	10,610	19.1	14,240	25.7	274	0.5	5,548	10.0	5,529	10.0
Fredonia	75	18.9	86	21.7	83	21.0	2	0.5	51	12.9	99	25.0
Page	1,073	31.6	563	16.6	805	23.7	18	0.5	512	15.1	425	12.5
Mohave County	12,366	20.4	15,237	25.2	16,892	27.9	261	0.4	7,989	13.2	7,772	12.8
Colorado City	154	17.6	76	8.7	192	21.9	8	0.9	278	31.8	167	19.1
Kaibab CDP	20	18.2	36	32.7	18	16.4	--	--	18	16.4	18	16.4
Kaibab Paiute Tribe	17	17.2	36	36.4	14	14.1	--	--	14	14.1	18	18.2
Virgin River Comm.	63	9.0	248	35.3	185	26.4	3	0.4	139	21.9	64	9.1
Utah	339,310	32.5	145,862	14.0	301,556	28.9	5,417	0.5	110,873	10.6	141,334	13.5
<i>Kane County</i>	779	29.2	480	18.0	651	24.4	32	1.2	409	15.3	315	11.8
Big Water	52	22.4	46	19.8	77	33.2	--	--	29	12.5	28	12.1
Kanab	421	28.1	269	17.9	370	24.7	13	0.9	218	14.5	209	13.9
Washington County	9,575	26.9	6,517	18.3	9,799	27.5	148	0.4	4,914	13.8	4,693	13.2
Hildale	122	26.8	29	6.4	109	24.0	2	0.4	92	20.2	101	22.2
Hurricane	755	23.7	483	15.2	754	32.7	--	--	567	17.8	624	19.6
Ivins	449	24.2	362	19.5	526	28.3	6	0.3	260	14.0	255	13.7
St. George	5,488	27.3	3,839	19.1	5,876	29.2	68	0.3	2,439	12.1	2,408	12.0
Santa Clara	634	33.1	337	17.6	583	30.5	1	0.1	212	11.1	147	7.7
Washington	673	22.5	678	22.7	768	25.7	--	--	529	17.7	343	11.5
Nevada	239,717	25.7	229,795	24.6	257,647	27.6	2,499	0.3	106,600	11.4	97,022	10.4
<i>Clark County</i>	155,520	24.4	171,589	26.9	177,727	27.9	653	0.1	71,502	11.2	60,348	9.5
Bunkerville CDP	70	15.6	153	34.1	107	23.8	--	--	67	14.9	52	11.6
Mesquite	787	21.1	1,564	42.0	878	23.6	--	--	291	7.8	207	5.6
Lincoln County	368	25.2	295	20.2	371	25.4	49	3.4	244	16.7	131	9.0

CDP = Census Designated Place; "--" = No Data Available; Data Sources: U.S. Census Bureau, Census 2000

Table 4: Employment by Industry in the Study Area

	Agriculture, forestry, fishing and hunting, and mining		Construction		Manufacturing		Wholesale trade		Retail trade		Transportation and warehousing, and utilities	
	#	%	#	%	#	%	#	%	#	%	#	%
UNITED STATES	2,426,053	1.9	8,801,507	6.8	18,286,005	14.1	4,666,757	3.6	15,221,716	11.7	6,740,102	5.2
Arizona	32,676	1.5	193,464	8.7	228,590	10.2	73,441	3.3	273,864	12.3	111,186	5.0
Coconino County	957	1.7	4,265	7.7	2,881	5.2	910	1.6	7,308	13.2	2,991	5.4
Fredonia	15	3.8	57	14.4	34	8.6	2	0.5	64	16.2	20	5.1
Page	29	0.9	187	5.5	83	2.4	43	1.3	470	13.8	601	17.7
Mohave County	602	1.0	5,849	9.7	4,266	7.0	1,308	2.2	8,328	13.8	3,476	5.7
Colorado City	13	1.5	230	26.3	142	16.2	13	1.5	115	13.1	48	5.5
Kaibab CDP	--	--	9	8.2	24	21.8	--	--	2	1.8	4	3.6
Kaibab Paiute Tribe	--	--	5	5.1	24	24.2	--	--	2	2.0	4	4.0
Virgin River Com.	14	2.8	70	14.0	19	3.8	3	0.6	32	6.4	23	4.6
Utah	20,288	1.9	85,954	8.2	126,299	12.1	36,729	3.5	133,249	12.8	51,249	4.9
Kane County	148	5.6	234	8.8	149	5.6	35	1.3	293	11.0	213	8.0
Big Water	6	2.6	16	6.9	9	3.9	4	1.7	45	19.4	20	8.6
Kanab	65	4.3	121	8.1	107	7.1	20	1.3	171	11.4	129	8.6
Washington County	383	1.1	4,776	13.4	2,349	6.6	934	2.6	6,112	17.1	1,614	4.5
Hildale	9	2.0	85	18.7	85	18.7	4	0.9	52	11.4	19	4.2
Hurricane	29	0.9	527	16.6	313	9.8	80	2.5	637	20.0	162	5.1
Ivins	15	0.8	234	12.6	109	5.9	48	2.6	307	16.5	126	6.8
St. George	150	0.7	2,499	12.4	1,171	5.8	600	3.0	3,503	17.4	783	3.9
Santa Clara	10	0.5	213	11.1	65	3.4	45	2.4	327	17.1	75	3.9
Washington	--	--	471	15.7	189	6.3	33	1.1	537	18.0	147	4.9
Nevada	14,938	1.6	86,327	9.2	45,794	4.9	25,121	2.7	105,382	11.3	48,102	5.2
Clark County	1,724	0.3	62,115	9.7	23,478	3.7	15,064	2.4	71,237	11.2	32,410	5.1
Bunkerville CDP	5	1.1	40	8.9	28	6.2	--	--	36	8.0	21	4.7
Mesquite	13	0.3	295	7.9	101	2.7	40	1.1	372	10.0	82	2.2
Lincoln County	107	7.3	167	11.5	26	1.8	27	1.9	213	14.6	107	7.3

CDP = Census Designated Place; "--" = No Data Available; Data Sources: U.S. Census Bureau, Census 2000

Table 4: Employment by Industry in the Study Area (continued)

	Information		Finance, insurance, real estate, rental and leasing		Professional, scientific, mgmt., admin. and waste mgmt.		Educational, health and social services;		Arts, entertainment, recreation, accomd., and food services		Other services (except public administration)		Public Administration	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
UNITED STATES	3,996,564	3.1	8,934,972	6.9	12,061,865	9.3	25,843,029	19.9	10,210,295	7.9	6,320,632	4.9	6,212,015	4.8
Arizona	62,577	2.8	175,311	7.9	229,660	10.3	402,183	18.0	225,129	10.1	103,305	4.6	121,618	5.4
Coconino County	851	1.5	2,167	3.9	3,290	5.9	14,918	26.9	9,035	16.3	2,183	3.9	3,754	6.8
Fredonia	--	--	--	--	15	3.8	70	17.7	53	13.4	40	10.1	26	6.6
Page	41	1.2	181	5.3	104	3.1	713	21.0	682	20.1	115	3.4	147	4.3
Mohave County	978	1.6	2,770	4.6	3,133	5.2	9,070	15.0	15,020	24.8	2,980	4.9	2,737	4.5
Colorado City	6	0.7	13	1.5	33	3.8	141	16.1	48	5.5	48	5.5	25	2.9
Kaibab CDP	--	--	2	1.8	--	--	11	10.0	23	20.9	10	9.1	25	22.7
Kaibab Paiute Tribe	--	--	2	2.0	--	--	11	11.1	23	23.2	6	6.1	22	22.2
Virgin River Com.	5	1.0	14	2.8	17	3.4	45	9.0	248	49.5	--	--	11	2.2
Utah	34,712	3.3	70,996	6.8	98,148	9.4	200,272	19.2	83,035	8.0	46,128	4.4	57,303	5.5
Kane County	37	1.4	92	3.5	101	3.8	399	15.0	504	18.9	251	9.4	210	7.9
Big Water	3	1.3	9	3.9	2	0.9	28	12.1	59	25.4	16	6.9	15	6.5
Kanab	18	1.2	59	3.9	73	4.9	241	16.1	211	14.1	160	10.7	125	8.3
Washington County	595	1.7	2,019	5.7	2,449	6.9	6,687	18.8	4,615	12.9	1,852	5.2	1,261	3.5
Hildale	2	0.4	14	3.1	17	3.7	88	19.3	21	4.6	40	8.8	19	4.2
Hurricane	32	1.0	83	2.6	152	4.8	598	18.8	393	12.3	100	3.1	77	2.4
Ivins	33	1.8	72	3.9	132	7.1	313	16.8	258	13.9	145	7.8	66	3.6
St. George	385	1.9	1,338	6.7	1,511	7.5	3,651	18.1	2,741	13.6	1,104	5.5	682	3.4
Santa Clara	33	1.7	155	8.1	162	8.5	428	22.4	208	10.9	101	5.3	92	4.8
Washington	48	1.6	108	3.6	202	6.8	660	22.1	321	10.7	165	5.5	110	3.7
Nevada	20,969	2.2	60,216	6.5	82,172	8.8	119,967	12.9	245,679	26.3	36,742	3.9	41,871	4.5
Clark County	14,464	2.3	43,631	6.8	58,783	9.2	74,923	11.8	191,596	30.1	24,656	3.9	23,258	3.6
Bunkerville CDP	12	2.7	19	4.2	42	9.4	46	10.2	183	40.8	10	2.2	7	1.6
Mesquite	35	0.9	188	5.0	250	6.7	313	8.4	1,876	50.3	59	1.6	103	2.8
Lincoln County	52	3.6	40	2.7	38	2.6	313	21.5	155	10.6	32	2.2	181	12.4

CDP = Census Designated Place; "--" = No Data Available; Data Sources: U.S. Census Bureau, Census 2000

Table 5: Education Attainment (percent) in the Study Area

	Less than high school	High School Graduate	Some College	Associate Degree	Bachelor's degree	Graduate or Professional Degree
UNITED STATES	19.6	28.6	21.0	6.3	15.5	8.9
Arizona	19.0	24.3	26.4	6.7	15.2	8.4
<i>Coconino County</i>	16.3	21.6	26.3	5.9	18.7	11.3
Fredonia	25.4	31.5	28.9	4.4	6.1	3.7
Page	12.3	28.3	30.9	9.1	12.9	6.6
<i>Mohave County</i>	22.5	34.9	27.1	5.6	6.4	3.6
Colorado City	29.4	39.4	17.8	8.3	4.7	0.4
Kaibab CDP	18.7	33.3	30.9	8.1	8.9	--
Kaibab Paiute Tribe	17.0	36.6	30.4	8.9	7.1	--
Virgin River Com.	21.7	32.2	24.8	3.2	5.7	2.3
Utah	12.3	24.6	29.1	7.9	17.9	8.3
<i>Kane County</i>	13.6	26.2	32.3	6.8	14.0	7.2
Big Water	14.8	38.8	27.7	6.8	10.8	1.1
Kanab	13.3	25.5	32.2	5.6	14.5	8.8
<i>Washington County</i>	12.4	26.7	31.9	8.0	13.9	7.0
Hildale	26.8	42.5	18.2	3.7	6.9	1.9
Hurricane	15.8	24.6	32.7	7.7	12.9	6.3
Ivins	10.0	28.0	33.1	8.9	13.6	6.5
St. George	12.2	26.3	31.3	8.2	14.5	7.5
Santa Clara	5.9	21.4	34.2	11.0	19.0	8.6
Washington	12.7	27.7	33.6	7.6	11.4	7.0
Nevada	19.3	29.3	27.0	6.2	12.1	6.1
<i>Clark County</i>	20.5	29.9	26.4	5.9	11.5	5.9
Bunkerville CDP	28.5	28.9	26.4	4.9	11.3	--
Mesquite	22.7	31.9	25.3	5.6	9.3	5.3
<i>Lincoln County</i>	17.0	37.8	24.4	5.8	10.0	5.0

CDP = Census Designated Place; "--" = No Data Available
 Data Sources: U.S. Census Bureau – all 2000 numbers

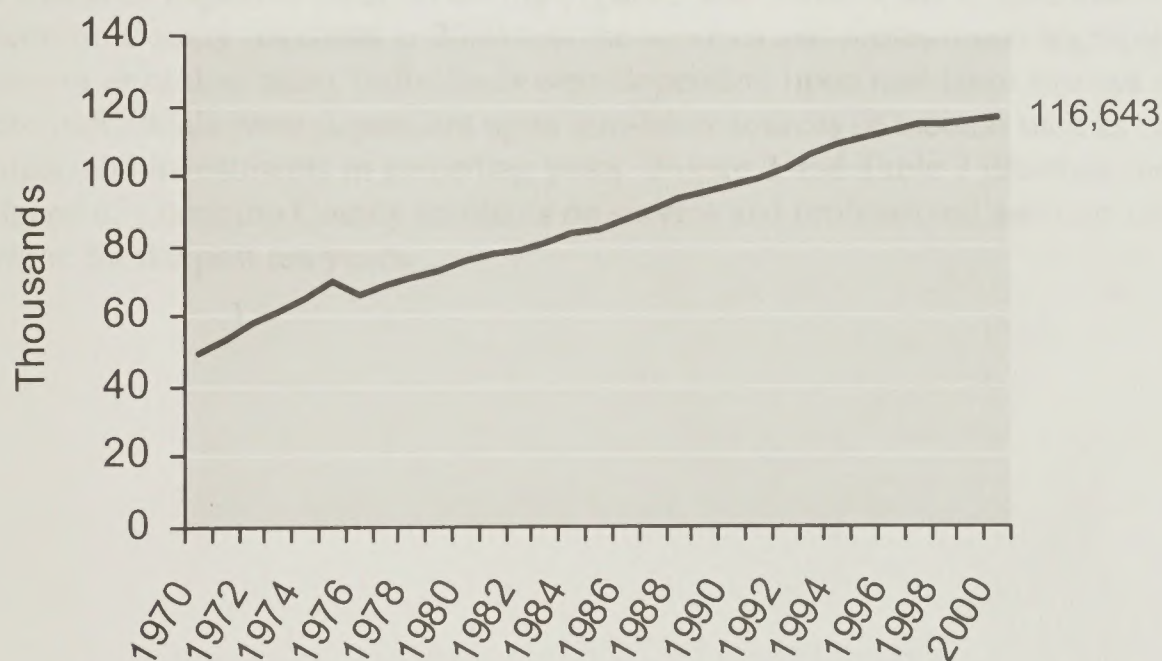
COUNTY AND COMMUNITY PROFILES

Coconino County, Arizona

Coconino County is the second largest county in the United States in terms of area, encompassing 18,608 square miles. It is also one of the most sparsely populated counties in the nation, with a population of 116,320 in 2000. The county's major population center is Flagstaff, which had a 2000 population of 52,894; much of the remainder is rural. The Arizona Strip portion of the county, in particular, is rural with minimal population found in the small isolated communities of Fredonia, Greentown, and Marble Canyon. Indian reservations, including the Navajo, Hopi, Paiute, Havasupai, and Hualapai nations, comprise 38.1 percent of the land. The U.S. Forest Service and BLM manage 32.3 percent of the land; the state of Arizona owns 9.5 percent; other public lands comprise 6.8 percent; and private individuals and corporations own the remaining 13.3 percent.

Figure 1 illustrates the population growth in Coconino County from 1970 to 2000. From 1990 and 2000, the population in Coconino County grew by 20.4 percent. Although this is a greater increase than the national average of 11.6 percent over the same ten-year period, it is half as much as the population growth in Arizona, which experienced a 40 percent increase. According to Arizona Department of Economic Security (DES) projections, Coconino County is expected to grow by 63.2 percent between 2000 and 2030, reaching a population of 189,868.

Figure 1. Population Growth in Coconino County, Arizona, 1970-2000 (Sonoran Institute 2003)



In 2000, Coconino County had a labor force of 70,657 people, an unemployment rate of 5.4 percent compared to a state rate of 4.7 percent and a national rate of 4.8 percent, and a per capita income of \$17,139, which was lower than the state and national averages of \$20,275 and \$21,587 respectively. Employment by occupation in the county is similar to the state and nation,

with the greatest percentage of workers employed in the Services and Professional sector at 66.4 percent, government at 21.5 percent, and construction at 6.6 percent. More detail about how employment in various sectors has changed over the past 30 years can be found in Figure 2 and Table 6.

Figure 2: Employment by Industry in Coconino County, 1970-2000 (Sonoran Institute 2003)

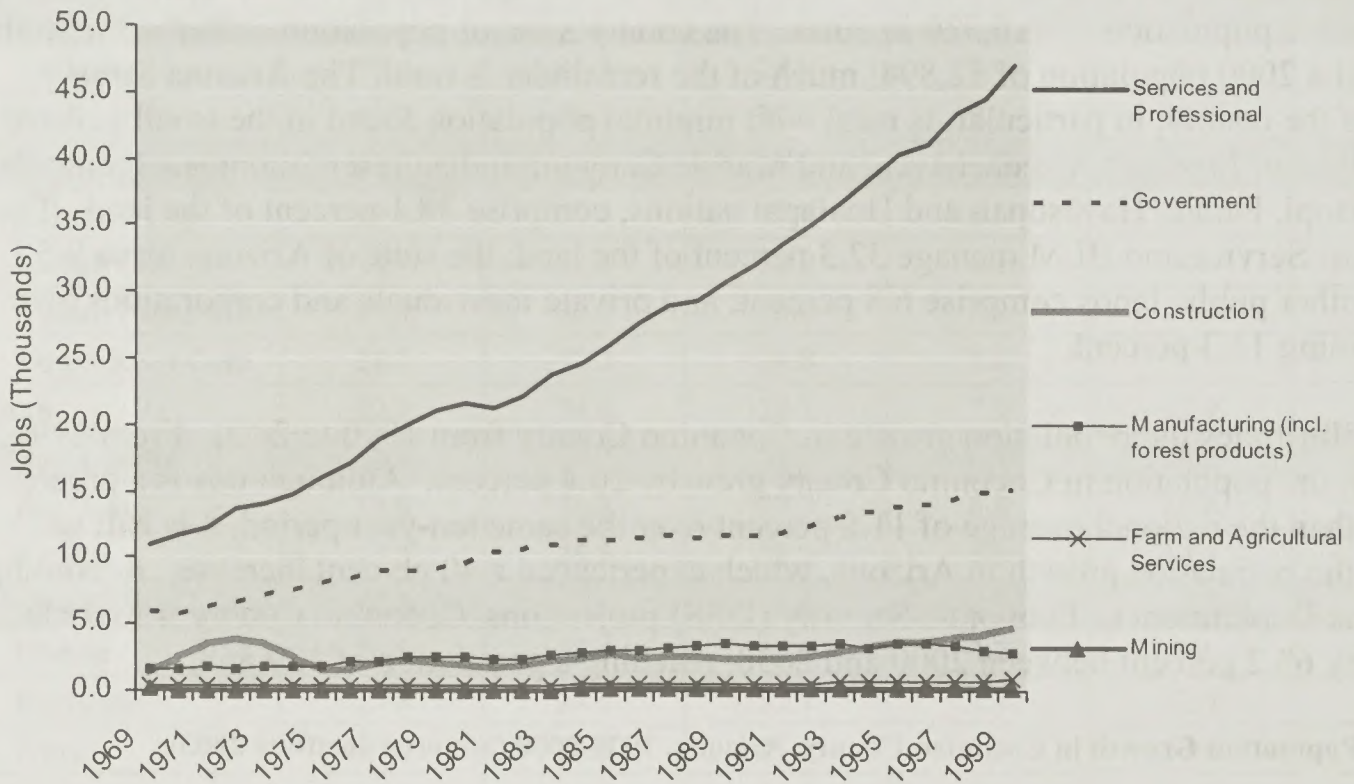


Table 6: Coconino County Employment by Industry from 1970 to 2000

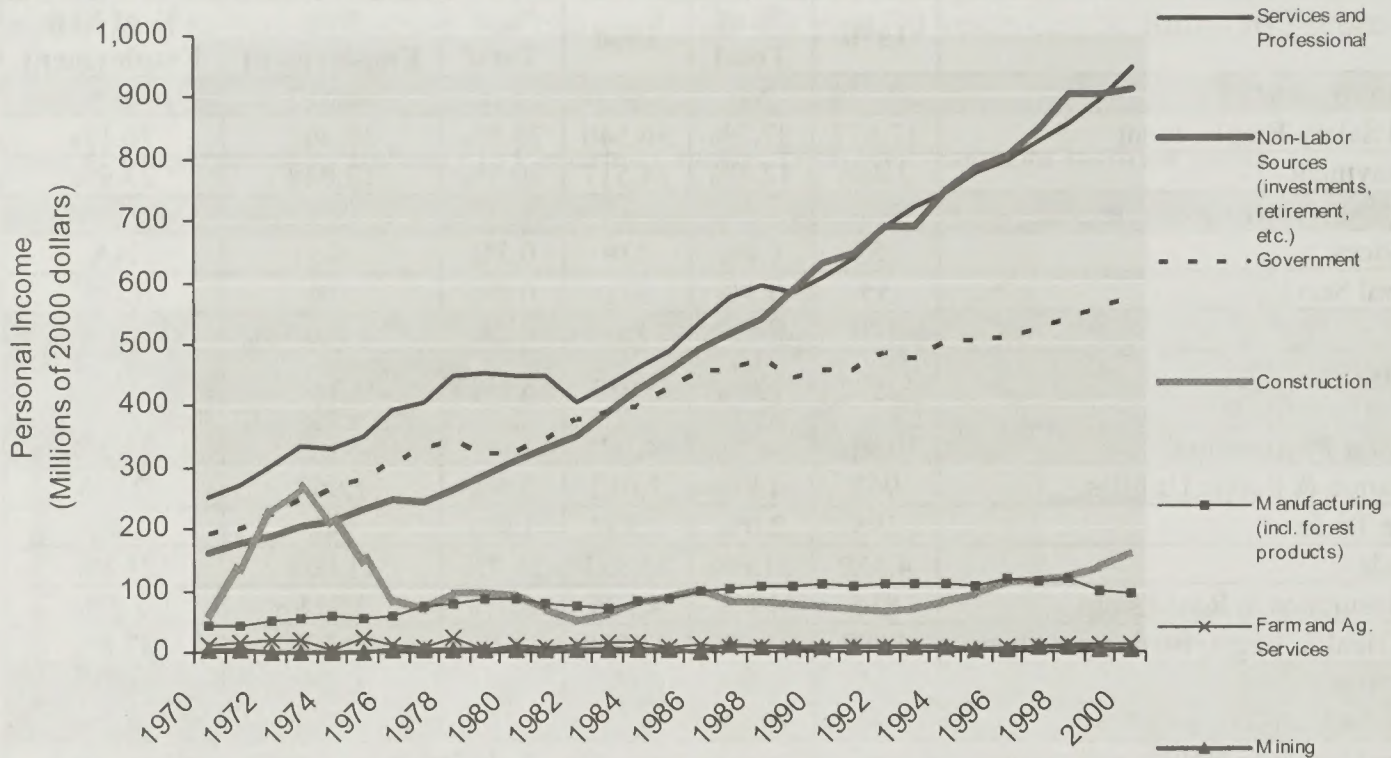
	1970	% of Total	2000	% of Total	New Employment	% of New Employment
Total Employment	20,145	NA	70,657	NA	50,512	NA
Wage and Salary Employment	17,677	87.7%	56,140	79.5%	38,463	76.1%
Self Employment	2,468	12.3%	14,517	20.5%	12,049	23.9%
Farm and Agricultural Services	338	1.7%	810	1.1%	472	0.9%
Farm Services	283	1.4%	239	0.3%	-44	NA
Agricultural Services	55	0.3%	571	0.8%	516	1.0%
Mining	100	0.5%	153	0.2%	53	0.1%
Manufacturing (incl. forest products)	1,577	7.8%	2,919	4.1%	1,342	2.7%
Services and Professional	10,915	54.2%	46,928	66.4%	36,013	71.3%
Transportation & Public Utilities	962	4.8%	2,012	2.8%	1,050	2.1%
Wholesale Trade	395	2.0%	1,337	1.9%	942	1.9%
Retail Trade	4,350	21.6%	15,353	21.7%	11,003	21.8%
Finance, Insurance & Real Estate	815	4.0%	4,726	6.7%	3,911	7.7%
Services (Health, Legal, Business, Others)	4,393	21.8%	23,500	33.3%	19,107	37.8%
Construction	1,271	6.3%	4,690	6.6%	3,419	6.8%
Government	5,944	29.5%	15,157	21.5%	9,213	18.2%

Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing.

Source: Sonoran Institute 2003

As would be expected from reviewing Figure 2 and Table 6, the largest source of income for Coconino County residents in 2000 was the services and professional segment of the economy; however almost as many individuals were dependent upon non-labor sources of income. In fact, more individuals were dependent upon non-labor sources of income such as retirement funds, rentals, and investments in preceding years. Figure 3 and Table 7 illustrate the near equal reliance of Coconino County residents on service and professional and non-labor sources of income for the past ten years.

Figure 3. Personal Income by Type in Coconino County, 1970-2000 (Sonoran Institute)



	1970	% of Total in 1970	2000	% of Total in 2000	New Income 1970 to 2000	% of New Income
Total Personal Income*	678	NA	2,557	NA	1,879	NA
Farm and Agricultural Services	13	1.9%	11	0.4%	-3	NA
Farm	12	1.8%	3	0.1%	-10	NA
Ag. Services	1	0.1%	8	0.3%	7	0%
Mining	4	0.6%	3	0.1%	-1	NA
Manufacturing (incl. forest products)	45	6.6%	94	3.7%	49	3%
Services and Professional	251	37.0%	947	37.0%	696	37%
Transportation & Public Utilities	41	6.1%	78	3.0%	37	2%
Wholesale Trade	12	1.8%	38	1.5%	25	1%
Retail Trade	95	14.0%	243	9.5%	149	8%
Finance, Insurance & Real Estate	12	1.8%	65	2.5%	53	3%
Services (Health, Legal, Business, Others)	91	13.4%	523	20.5%	432	23%
Construction	64	9.4%	156	6.1%	92	5%
Government	194	28.6%	571	22.3%	377	20%
Non-Labor Income	161	23.8%	909	35.6%	748	40%
Dividends, Interest & Rent	92	13.6%	566	22.1%	474	25%
Transfer Payments	69	10.2%	343	13.4%	274	15%

All figures in millions of 2000 dollars
 *The sum of the above categories do not add to total due to adjustments made for place of residence and personal contributions for social security insurance made by the U.S. Department of Commerce.
 Source: Sonoran Institute 2003

Fredonia

Fredonia is the northernmost town in Coconino County. Located at the intersection of U.S. Hwy 89A and State Highway 389 near the Utah border on the Arizona Strip, the town has an area of 7.4 square miles and sits at approximately 4,800 feet in elevation. Founded in 1885, Fredonia is the largest town in the Coconino County portion of the Arizona Strip. Although the State of Arizona saw a 40 percent increase in population growth between 1990 and 2000, Fredonia saw a 13 percent decrease in population over the same period, from 1,207 in 1990 to 1,036 in 2000. However, the community's population is projected to steadily increase over the next 30 years to a population of 1,811 (Arizona DES 2000).

Fredonia's economy has been derived historically from agriculture, timber, and mining. Since the closing of the sawmill in 1995, the town has been trying to identify a new and viable industry and is coming to rely on tourism from visitors to the Arizona Strip and nearby national parks, national forests, monuments, and other recreation sites. There were 433 people in Fredonia's civilian labor force in 2000. Sixty-two percent of workers worked out of town and 43 percent worked out of state. However, the average commute time for 63 percent of workers was less than 20 minutes, suggesting that they did not travel far, most likely to Kanab, Utah, only 10 miles away.

In 2000, Fredonia's unemployment rate was only 5.2 percent; however, per capita income was \$13,309, which was 62 percent lower than the national per capita income of \$21,587.

Page and Grenehaven

The City of Page is a planned community located just east of the Colorado River and the Arizona Strip. It is situated near the Utah border and adjacent to Lake Powell. Named for John C. Page, Commissioner of the Bureau of Reclamation under Franklin Roosevelt, Page was originally planned and developed for the workers building Glen Canyon Dam in 1957. The City of Page was incorporated on March 1, 1975 and includes 16.6 square miles of land on Manson Mesa. The city saw almost no growth during the 10-year period from 1990 to 2000, during which population increased by a mere 3.1 percent from 6,598 to 6,809. However, Page's population is projected to more than double over the next 30 years to a population of 14,481.

The unemployment rate in Page in 2000 was 6.1 percent and per capita income was \$18,691. The current economic structure supporting Page depends largely on tourism drawn by the lake as well as the Salt River Project Navajo Generating Station. The largest industry is the educational, health, and social services industry, which employs 21 percent of the workforce, followed by arts, entertainment, recreation, accommodation, and food services that encompass 20 percent of the workforce. The vast majority of employees who live in Page work within Arizona (97 percent) and Coconino County (93 percent), with a smaller majority (62 percent) working directly in town. Even those who work out of town do not travel far from home as 80 percent of workers commute less than 20 minutes.

The community of Grenehaven consists of 491 acres bordered on the north by the Arizona-Utah state line and situated on Highway 89 northwest of Page. The area is located on the western side of Lake Powell and has views of Wahweap Bay, Castle Rock, Lone Rock, and other features along the Bay. Development of this community began in 1980 with a rezoning to Planned Community and creation of a master plan for a mixed use community encompassing resort, residential, commercial, and light industrial uses. Originally state trust land, the area is now surrounded by Glen Canyon NRA lands. The commercial areas have seen development of only a convenience market with gas sales and a boat storage facility. Grenehaven serves as both a residential community for the city of Page, and a vacation home area for Lake Powell.

The Marble Canyon Area

The Marble Canyon area is located within the eastern portion of the Planning Area, east of Kaibab National Forest. It consists of a series of lodges along Highway 89A at the base of the Vermilion Cliffs: Vermilion Cliffs Lodge, Marble Canyon Lodge, and Cliff Dweller's Lodge, as well as isolated home sites and ranches. All of these communities/businesses are now located on the southern border of Vermilion Cliffs National Monument. The communities/businesses were developed after 1928, the year that Navajo Bridge was constructed to allow vehicular access across the Colorado River south of Lees Ferry. They are now popular stopping places for visitors to Vermilion and adjacent public lands, as well as river runners preparing for a trip through Grand Canyon (originating at nearby Lees Ferry); anglers visiting the Lees Ferry trout fishery; and tourists who are traveling to the North Rim of the Grand Canyon, Lake Powell, or other tourist destinations in the area.

Marble Canyon is located immediately west of Navajo Bridge and the Colorado River and about six miles from Lees Ferry. The community encompasses 60 acres north of Highway 89A and 113 acres south of the highway. Only a small portion of this land is developed, including a 51-room motel, restaurant, convenience store/trading post, post office, gas station, airstrip, and residences for managers and employees. Marble Canyon Lodge employs 45-65 people during the peak summer season; however, business is year-round. Approximately 20 licensed fishing guides work in the area (SWCA 1999).

Vermilion Cliffs Lodge encompasses 10 developed acres and includes the 11-room Lees Ferry Lodge, restaurant, fishing supply and art store, and employee housing. Badger Creek is adjacent to Vermilion Cliffs and encompasses 38 acres of land split into 27 parcels ranging in size from one to three acres and primarily developed with residential single-family homes, and a commercial warehouse used by a local river outfitter.

Cliff Dwellers includes a 24-acre parcel occupied by a 20-room lodge, restaurant, fly shop, gas station, and employee housing; a river company warehouse; three large undeveloped parcels of land surrounding the lodge; seven 40-acre parcels of which one has been developed; the Cliff Dweller Homeland subdivision, consisting of six undeveloped 5-acre lots; and one 20-acre parcel

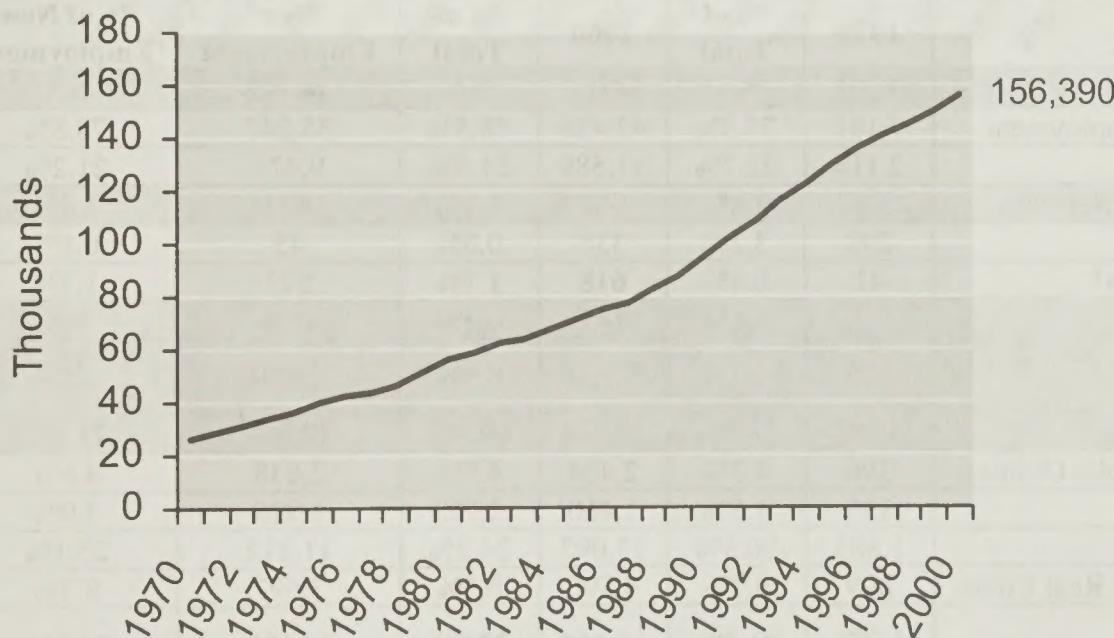
occupied by a single family residence (personal communication, Sue Pratt, Coconino County Planner, September 2003). In 1999, Cliff Dwellers Lodge employed 13-14 employees during the summer months and 3-4 employees during the winter months (SWCA 1999).

Mohave County, Arizona

Mohave County is the second largest county in the state geographically, encompassing 8,519,680 acres. It is bisected by the Grand Canyon, requiring travelers to go through Utah or Nevada to travel between northern and southern sections of the county. The BLM manages 55.2 percent of the land, NPS manages 14.3 percent, USFS manages less than one percent, Indian reservations make up 6.7 percent, the state of Arizona owns 6.6 percent, and individuals and corporations own 17.2 percent.

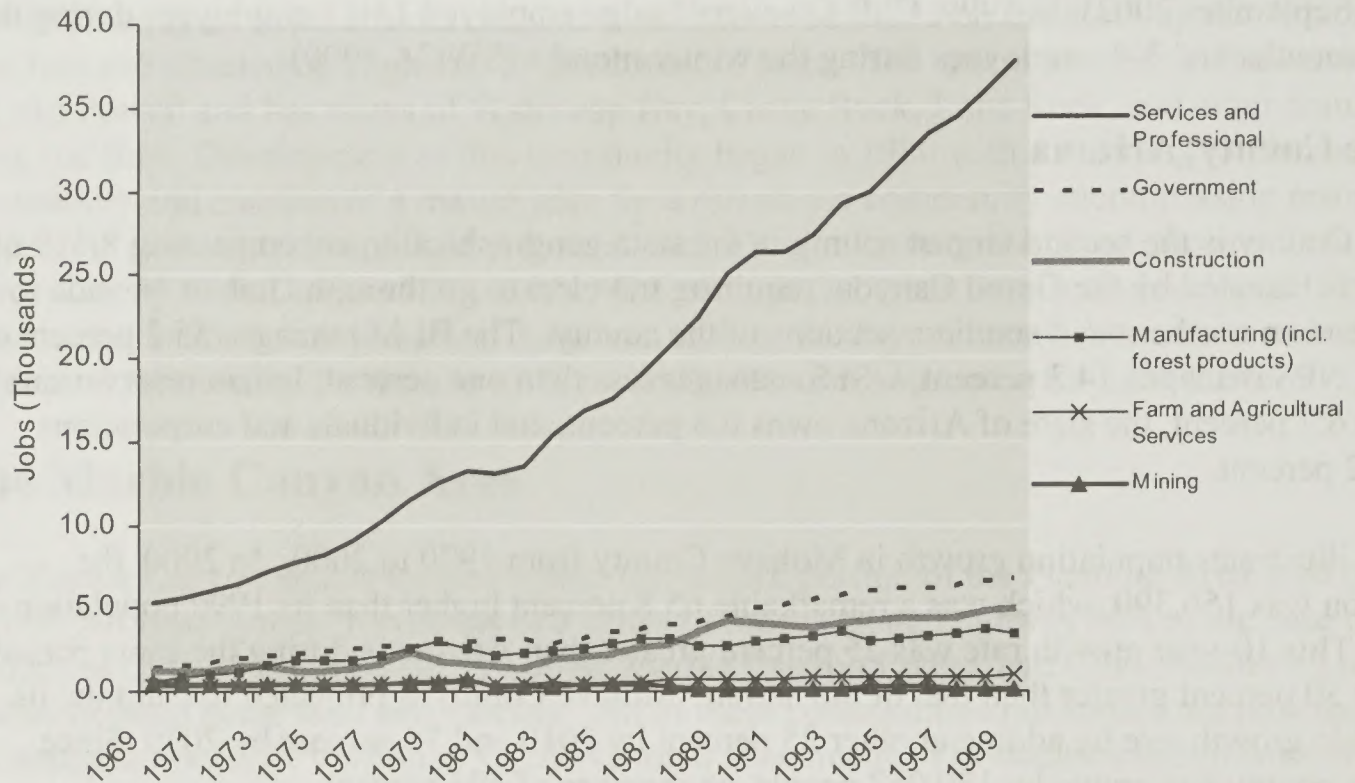
Figure 4 illustrates population growth in Mohave County from 1970 to 2000. In 2000, the population was 156,390, which was a remarkable 65.8 percent higher than its 1990 population of 93,497. This 10-year growth rate was 25 percent greater than Arizona’s during the same period, and over 50 percent greater than that of the nation. Mojave County is projected to continue its remarkable growth rate by adding another 25 percent by 2010 and 75 percent by 2030. Since 1970, the county has grown by 130,052 people, an increase of 494 percent.

Figure 4. Population Growth in Mohave County, Arizona, 1970-2000 (Sonoran Institute 2003)



In 2000, the civilian labor force consisted of 65,040 people and the unemployment rate was 7.0 percent. Per capita income in the county was \$16,788, roughly three to four thousand dollars less than Arizona and the nation. Mohave County’s dependence on tourism is indicated by its main industry being the arts, entertainment, recreation, accommodation, and food services, which employed one quarter of all workers. The dominance and rapid growth of the service and professional industries over the past 30 years is presented in Figure 5 and Table 8.

Figure 5. Employment by Industry in Mohave County, 1970-2000 (Sonoran Institute 2003)



	1970	% of Total	2000	% of Total	New Employment	% of New Employment
Total Employment	9,295	NA	54,017	NA	44,722	NA
Wage and Salary Employment	7,181	77.3%	42,428	78.5%	35,247	78.8%
Self Employment	2,114	22.7%	11,589	21.5%	9,475	21.2%
Farm and Agricultural Services	334	3.6%	956	1.8%	622	1.4%
Farm	293	3.2%	338	0.6%	45	0.1%
Agricultural Services*	41	0.4%	618	1.1%	577	1.3%
Mining	525	5.6%	149	0.3%	-376	NA
Manufacturing (incl. forest products)	575	6.2%	3,503	6.5%	2,928	6.5%
Services and Professional	5,287	56.9%	37,751	69.9%	32,464	72.6%
Transportation & Public Utilities	396	4.3%	2,434	4.5%	2,038	4.6%
Wholesale Trade	135	1.5%	1,460	2.7%	1,325	3.0%
Retail Trade	1,885	20.3%	13,097	24.2%	11,212	25.1%
Finance, Insurance & Real Estate	899	9.7%	4,596	8.5%	3,697	8.3%
Services (Health, Legal, Business, Others)	1,972	21.2%	16,164	29.9%	14,192	31.7%
Construction	1,137	12.2%	4,891	9.1%	3,754	8.4%
Government	1,437	15.5%	6,767	12.5%	5,330	11.9%

*Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing.
Source: Sonoran Institute

While Figure 5 and Table 8 illustrate that the service and professional industry comprises the majority of employment in Mohave County, non-labor sources were the largest source of income in 2000. As Figure 6 and Table 9 illustrate, residents in the county consistently and increasingly depended upon non-labor sources of income beginning in 1974.

Figure 6. Personal Income by Type in Mohave County, 1970-2000 (Sonoran Institute 2003)

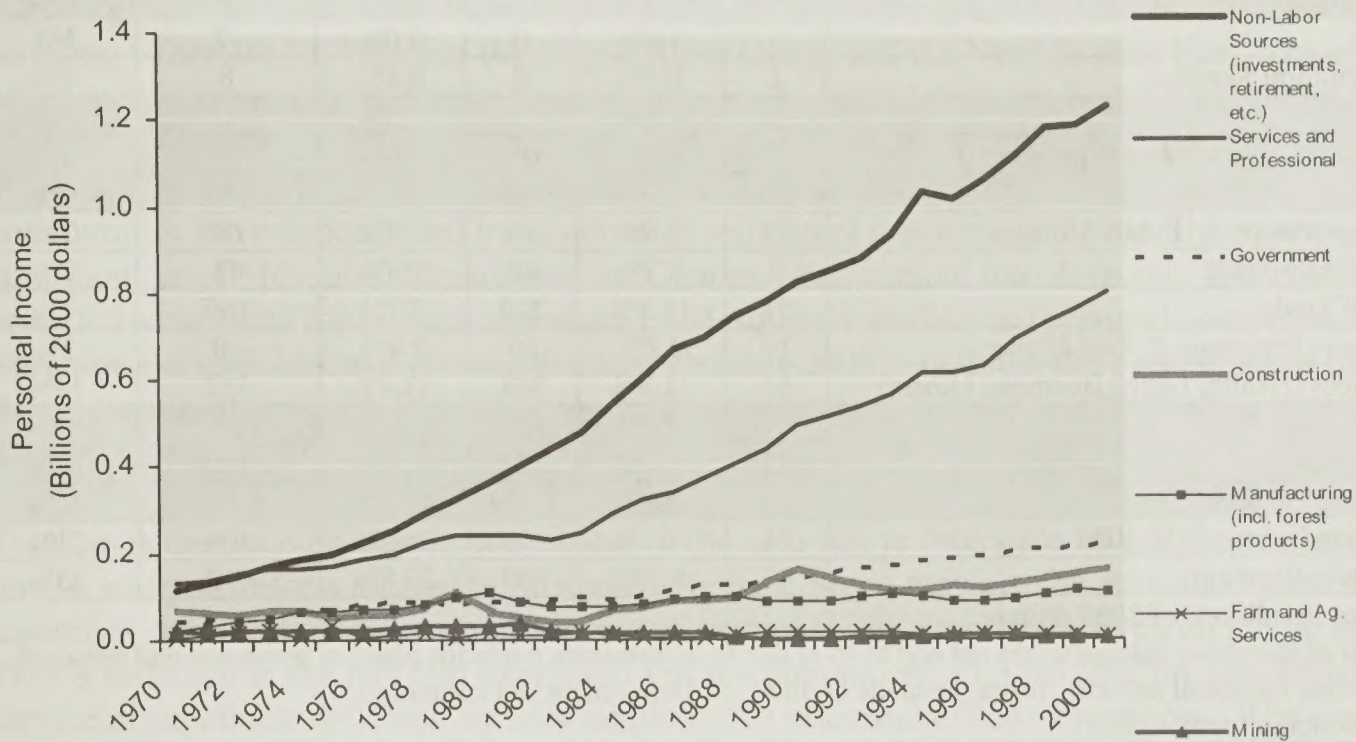


Table 9 :New Income by Type in Mohave County

	1970	% of Total in 1970	2000	% of Total in 2000	New Income 1970 to 2000	% of New Income
Total Personal Income*	442	NA	2,866	NA	2,424	NA
Farm and Agricultural Services	8	1.8%	8	0.3%	0	0%
Farm	7	1.6%	0	0.0%	-7	NA
Agricultural Services	1	0.2%	9	0.3%	8	0%
Mining	21	4.8%	5	0.2%	-16	NA
Manufacturing (incl. forest products)	22	5.0%	109	3.8%	87	4%
Services and Professional	132	29.8%	805	28.1%	673	28%
Transportation & Public Utilities	17	3.8%	86	3.0%	69	3%
Wholesale Trade	3	0.7%	46	1.6%	43	2%
Retail Trade	51	11.5%	220	7.7%	169	7%
Finance, Insurance & Real Estate	10	2.2%	69	2.4%	60	2%
Services (Health, Legal, Business, Others)	51	11.5%	383	13.4%	332	14%
Construction	64	14.5%	158	5.5%	94	4%
Government	42	9.6%	222	7.7%	180	7%
Non-Labor Income	114	25.8%	1,234	43.0%	1,120	46%
Dividends, Interest & Rent	71	16.1%	579	20.2%	508	21%
Transfer Payments	43	9.7%	654	22.8%	612	25%

All figures in millions of 2000 dollars

*The sum of the above categories do not add to total due to adjustments made for place of residence and personal contributions for social security insurance made by the U.S. Department of Commerce.

Source: Sonoran Institute 2003

Colorado City

Colorado City is on the northern border of Arizona on Highway 389, adjacent to Hildale, Utah. It was originally called Short Creek due to a nearby stream that sank into the sand before it ran very far. The first settlers were ranchers and cattlemen who came to the area in the early 1900's. In about 1930, a group of religious fundamentalists from Utah seeking refuge played a major part in shaping the community into its current form. The name of the community was officially changed to Colorado City in 1963. In 2000, the population of Colorado City was 3,334, which was a 34 percent increase over 1990. The population is projected to nearly double over the next 20 years to a population of 7,598.

Residents of Colorado City are primarily employed in construction, extractive industries, and maintenance occupations, which employ 31.8 percent of the workforce, followed by sales and office occupations, which employ 21.9 percent of the workforce. The main single industry is construction, which employs 26.3 percent of the workforce. Nearly half of the employees living in Colorado City work out of state, mainly in Hildale, Utah, which has an active industrial park and service industry. The commute to work for 78 percent of workers was under 20 minutes. The unemployment rate in Colorado City in 2000 was only 4.6 percent; however, per capita income for the town is the lowest in the study area at \$5,292, less than one third of the per capita

income in Coconino County and nearly one fourth of the national average. This is caused by Colorado City's large family size of 7.58 people, more than twice the national average of 3.14.

Virgin River Communities

The Virgin River communities of Desert Springs, Beaver Dam, Littlefield, Scenic, and Arvada lie along Interstate 15, between the Virgin River Gorge and the Nevada state line. The area offers scenic views of the Beaver Dam Mountains, Virgin Mountains, and the Virgin River Valley. The economy was originally based on agriculture and grazing, but agriculture proved difficult along the Virgin River as frequent flooding destroyed crops. In recent years, the communities have experienced tremendous development pressure as the rapidly growing communities of Mesquite, Nevada and St. George, Utah expand into Arizona. The communities provide living areas for retirees and much of Mesquite's workforce (personal communication, Christine Ballard, Mohave County Planner, October 2003). In 2000, the population of the Virgin River communities was 1,531. No census information is available for 1990 and no projections have been made.

Tourism is the main economic contributor to the area due to Interstate 15 and the casinos, spas, hotels, and golf resorts located in Mesquite, Nevada. Some may also be attracted by the natural amenities, such as the scenery and outdoor recreational opportunities offered on public lands. This is reflected in the fact that over a third of the population, 35.3 percent, are employed in service occupations, followed by 26.4 percent employed in sales and office occupations. The centrality of tourism is also reflected in the fact that 50.7 percent of the employees living in the Virgin River communities are employed in the arts, entertainment, recreation, accommodations, and food services. While some of these employees travel to the neighboring states of Nevada and Utah to work, the average commute time is less than 18 minutes, indicating that many work near home. The per capita income was \$14,201, which is the highest in the Mohave County communities examined, but over \$2,000 below the county average, and roughly six to seven thousand dollars below state and national averages. The unemployment rate in 2000 was 7.9 percent.

Kaibab Paiute Reservation and the Community of Moccasin, Arizona

The Kaibab-Paiute Reservation is located in the north central portion of the Arizona Strip on the Utah border. While the majority of the reservation is in Mohave County, the southeastern most section is located in Coconino County. The reservation has an area of 120,413 acres and consists of five villages: Kaibab, Steam Boat, Juniper Estes, Six-Mile, and Redhills. The community of Moccasin and Pipe Springs National Monument are located in the middle of the reservation but not on reservation lands. For census purposes, Moccasin is combined with the Kaibab-Paiute Reservation and referred to as Kaibab CDP (Census Designated Place). In 2000, Kaibab CDP had a population of 275, with 196 in the Reservation and 79 in the community of Moccasin. The population on the Reservation grew by 18.8 percent between 1990 and 2000. No 1990 census data is available for Kaibab CDP and no population projections have been made.

Because Arizona Highway 389 crosses the reservation and is the main route for travel between Las Vegas, Nevada, and Lake Powell, the Kaibab-Paiute economy is centered on tourism. Pipe Springs National Monument also draws a significant number of visitors. A majority of workers in Kaibab CDP are employed in service occupations. In 2000, per capita income on the Reservation was \$7,951 and \$9,421 on Kaibab CDP. Both numbers are roughly half of the per capita income for Mohave County during the same period. Forty-four percent of workers living in Kaibab CDP traveled out of state to work, with an average commute time of 24 minutes. In 2000, the unemployment rate for the reservation was 9.2 percent. There were only 11 people in the workforce living off reservations lands in Kaibab CDP, all of whom were employed in 2000.

Kane County, Utah

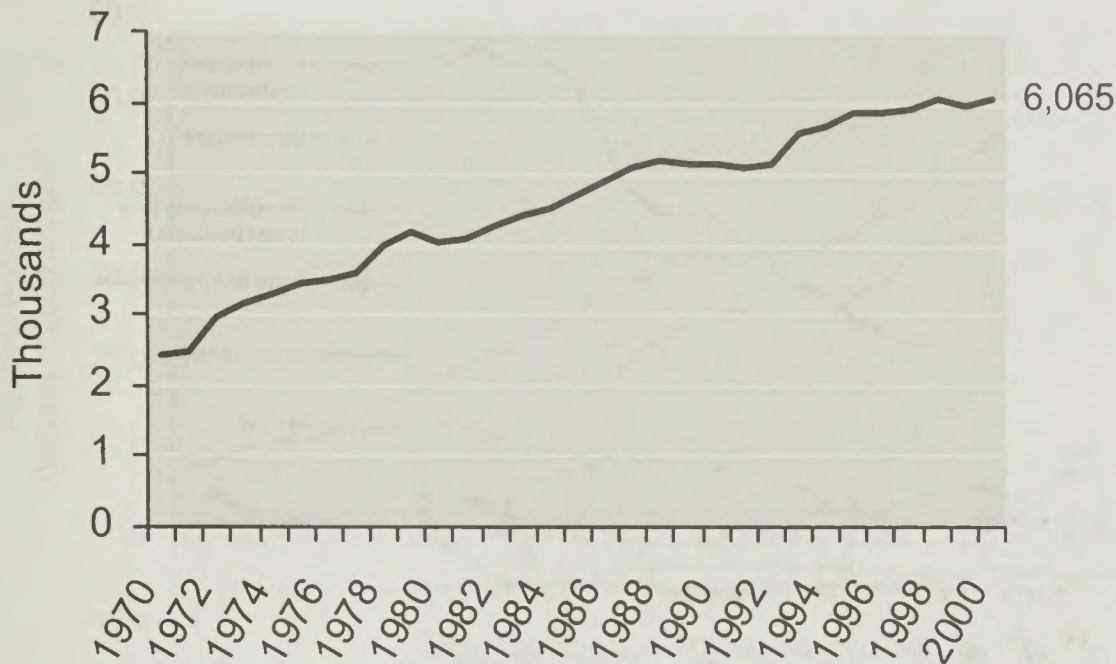
Kane County was founded by Mormon settlers in the 1860's. Since that time, the Planning Area has been used for grazing cattle and sheep, supporting families living in Kanab, St. George, and other southern Utah communities. Southern Utah ranchers continue to use the Planning Area, especially for winter grazing purposes. Today, however, only a small portion of Kane County's population is employed by farm and agricultural services (see Tables 3 and 4).

Kane County is adjacent to the Planning Area. Its residents have had a long history of association with the Arizona Strip. Geographically, culturally, and economically the people of Kane County have strong ties with the people and resources on the Arizona Strip.

The BLM flagstone/sandstone rock quarries in the Planning Area are of commercial importance to southern Utah rock businesses as well as to private residents as a source of decorative rock. Hunting and motorized tour guides based in Kane County depend on the natural resources in the Planning Area for their businesses. Tourism, in general, is an important feature of Kane County's economy as travelers often pass through on their way to visit the various national parks, monuments, and recreation areas in the vicinity, including the monuments found in the Planning Area (personal communication, Mark Habbeshaw, Kane County Commission, September 2003).

Kane County is sparsely populated, although it has been experiencing a slow and steady growth. Figure 7 illustrates the county's population from 1970 to 2000. Between 1990 and 2000, the population grew by only 17.0 percent. Although this is a greater increase than the national average, it is half as much as the population growth in neighboring Arizona, which experienced a 37.4 percent increase. Kane County is projected to grow over the three decades between 2000 and 2030, reaching a population of approximately 9,783 people.

Figure 7. Population Growth in Kane County, Utah, 1970-2000 (Sonoran Institute 2003)



In 2000, Kane County had a labor force of 2,816 people, an unemployment rate of 5.3 percent, and a per capita income of \$17,139. Employment by occupation in the county is similar to Utah and the nation, with the greatest percentage of workers employed in management, professional, and related occupations (see Table 3). Since 1982, when complete data became available, the employment profile of Kane County has changed considerably, with significant growth in the Services and Professional sector, and nearly no growth in farm and agricultural services. This is presented in Figure 8 and Table 10.

Figure 8. Employment by Industry in Kane County, 1970-2000 (Sonoran Institute 2003)

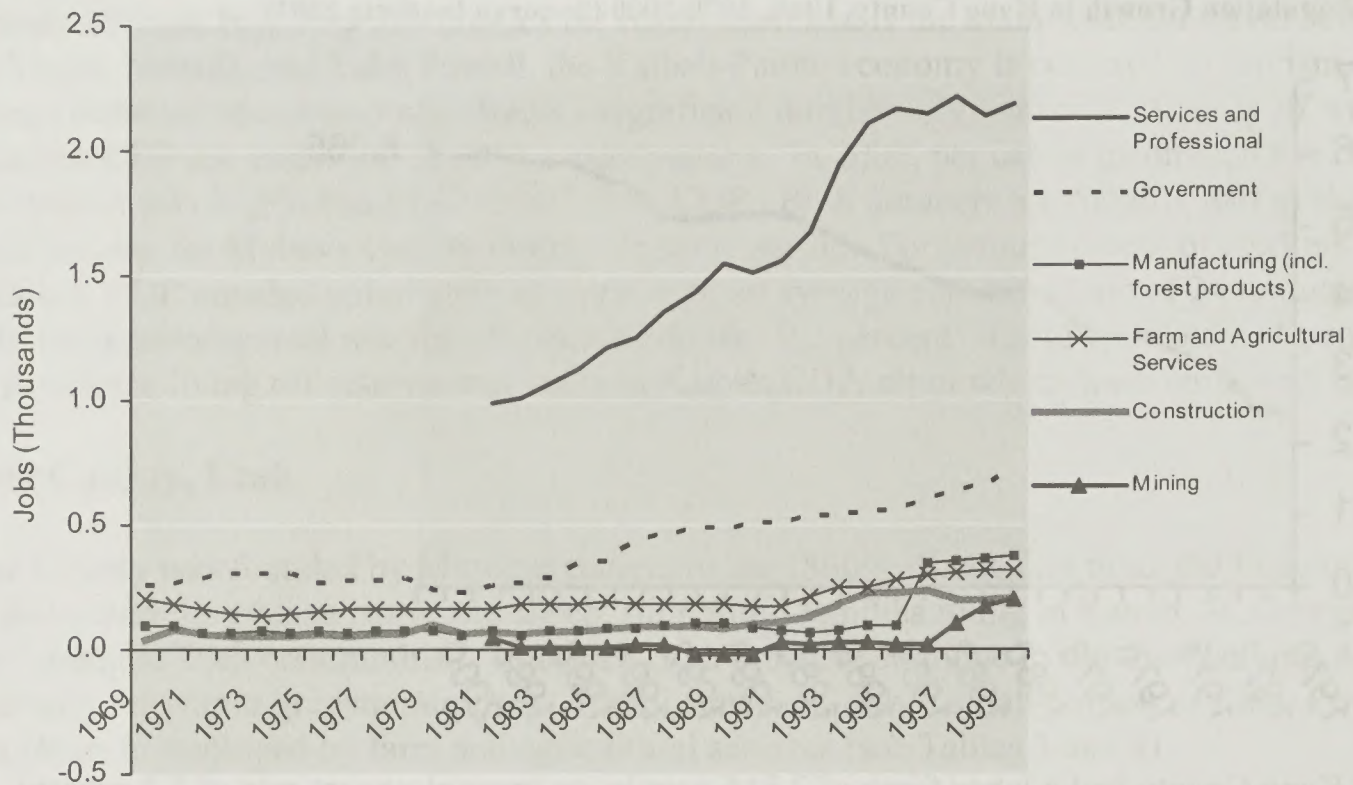


Table 10 Employment by Industry in Kane county from 1982-2000

	1982	% of Total	2000	% of Total	New Employment	% of New Employment
Total Employment	1,599	NA	3,992	NA	2,393	NA
Wage and Salary Employment	1,075	67.2%	2,966	74.3%	1,891	79.0%
Self Employment	524	32.8%	1,026	25.7%	502	21.0%
Farm and Agricultural Services	164	10.3%	322	8.1%	158	6.6%
Farm	156	9.8%	185	4.6%	29	1.2%
Agricultural Services	8	0.5%	137	3.4%	129	5.4%
Mining	44	2.8%	200	5.0%	156	6.5%
Manufacturing (incl. forest products)	75	4.7%	376	9.4%	301	12.6%
Services and Professional	989	61.9%	2,185	54.7%	1,196	50.0%
Transportation & Public Utilities	107	6.7%	99	2.5%	-8	NA
Wholesale Trade	26	1.6%	41	1.0%	15	0.6%
Retail Trade	393	24.6%	804	20.1%	411	17.2%
Finance, Insurance & Real Estate	55	3.4%	267	6.7%	212	8.9%
Services (Health, Legal, Business, etc.)	408	25.5%	974	24.4%	566	23.7%
Construction	66	4.1%	201	5.0%	135	5.6%
Government	261	16.3%	708	17.7%	447	18.7%

Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing; Source: Sonoran Institute 2003

Income sources have also undergone significant change since 1982, with non-labor income outpacing services, and significant growth in the government sector (including many new BLM jobs in Utah). This is illustrated in Figure 9 and Table 11.

Figure 9. Personal Income by Type in Kane County, 1970-2000 (Sonoran Institute 2003)

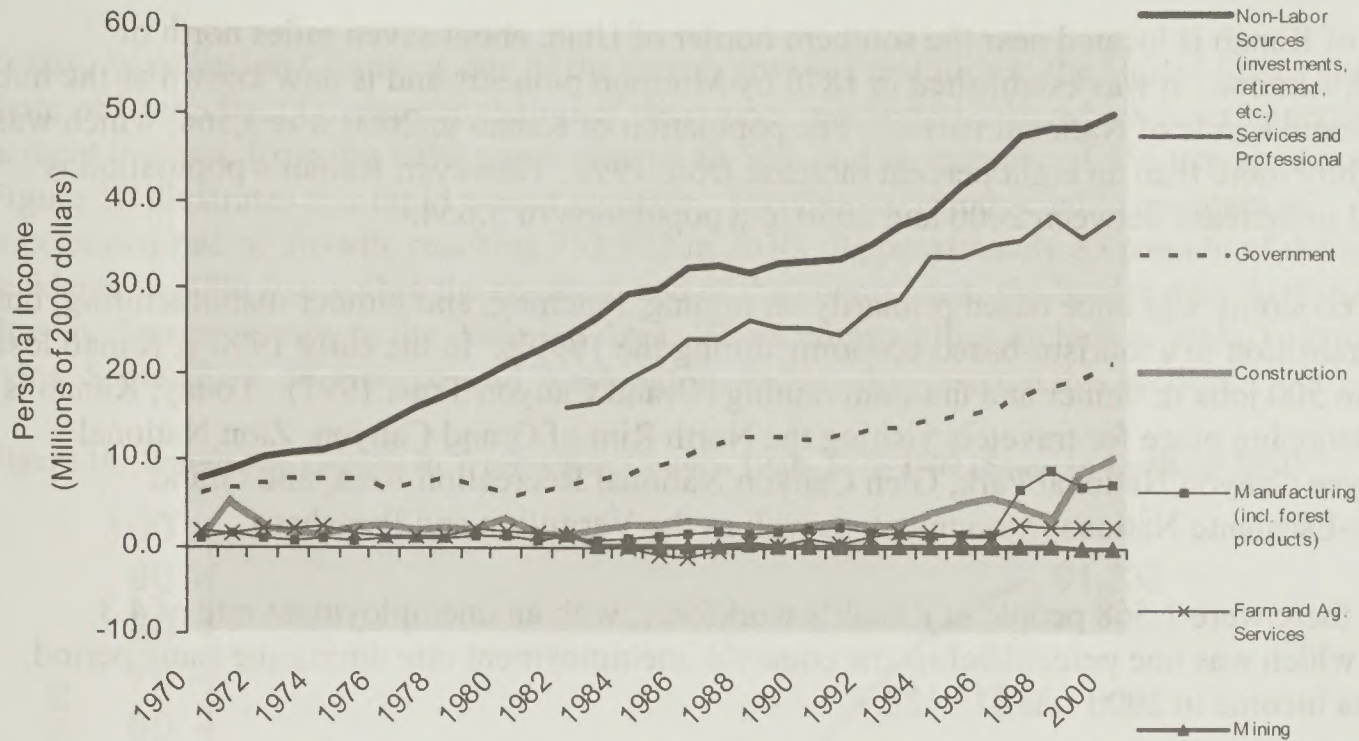


Table 11: New Income by Type in Kane County

	1982	% of Total in 1982	2000	% of Total in 2000	New Income 1982 to 2000	% of New Income
Total Personal Income*	61	NA	143	NA	82	NA
Farm and Agricultural Services	1	1.9%	9	6.6%	8	10%
Farm	1	1.9%	0	0.3%	-1	NA
Agricultural Services	0	0.0%	9	6.3%	9	11%
Mining	2	2.5%	0	0.0%	-2	NA
Manufacturing (incl. forest products)	1	2.2%	7	5.2%	6	7%
Services and Professional	16	26.5%	38	26.9%	22	27%
Transportation & Public Utilities	2	4.1%	4	2.9%	2	2%
Wholesale Trade	1	1.9%	1	0.4%	-1	NA
Retail Trade	5	9.0%	10	7.0%	5	6%
Finance, Insurance & Real Estate	1	1.4%	3	2.0%	2	2%
Services (Health, Legal, Business, Others)	6	10.2%	21	14.5%	15	18%
Construction	1	2.1%	4	2.5%	2	3%
Government	7	12.0%	21	15.0%	14	17%
Non-Labor Income	24	40.0%	50	35.2%	26	32%
Dividends, Interest & Rent	15	25.2%	26	18.5%	11	13%
Transfer Payments	9	14.7%	24	16.7%	15	18%

All figures in millions of 2000 dollars

*The sum of the above categories do not add to total due to adjustments made for place of residence and personal contributions for social security insurance made by the U.S. Department of Commerce.

Source: Sonoran Institute 2003

Kanab

The city of Kanab is located near the southern border of Utah, about seven miles north of Fredonia, Arizona. It was established in 1870 by Mormon pioneers and is now known as the hub in the "Grand Circle of National Parks." The population of Kanab in 2000 was 3,564, which was only slightly more than an eight percent increase from 1990. However, Kanab's population is projected to increase between 2000 and 2030 to a population of 5,654.

Kanab's economy was once based primarily on mining, ranching, and lumber manufacturing, but made a transition to a tourism-based economy during the 1990's. In the early 1990's, Kanab lost more than 500 jobs in timber and uranium mining (Grand Canyon Trust 1997). Today, Kanab is a major stopping place for travelers visiting the North Rim of Grand Canyon, Zion National Park, Bryce Canyon National Park, Glen Canyon National Recreation Area, and Grand Staircase-Escalante National Monument, as well as the Vermilion and Parashant.

In 2000, there were 1,568 people in Kanab's workforce, with an unemployment rate of 4.3 percent, which was one percent below the county's unemployment rate during the same period. Per capita income in 2000 was \$16,128.

Big Water

The town of Big Water is located on Highway 89 about 16 miles northwest of Page, Arizona. In 2000, there were 417 people in the town, which was a 27.9 percent increase from 1990. While this rate is over 10 percent higher than the county's growth rate over the same period, it is still lower than the average growth rate for Utah. The community is expected to continue to grow, more than doubling in size by 2030 to a population of 977.

Big Water's civilian labor force in 2000 was 244, with an unemployment rate of 4.9 percent. Roughly, a third of those employees worked in sales and office occupations. The largest industry in terms of employment was the arts, entertainment, recreation, accommodation, and food services. Seventy percent of employees living in Big Water work out of state, with the average commute time being just over 20 minutes. This suggests that most people work in nearby Page, Arizona. Per capita income in 2000 was \$15,026.

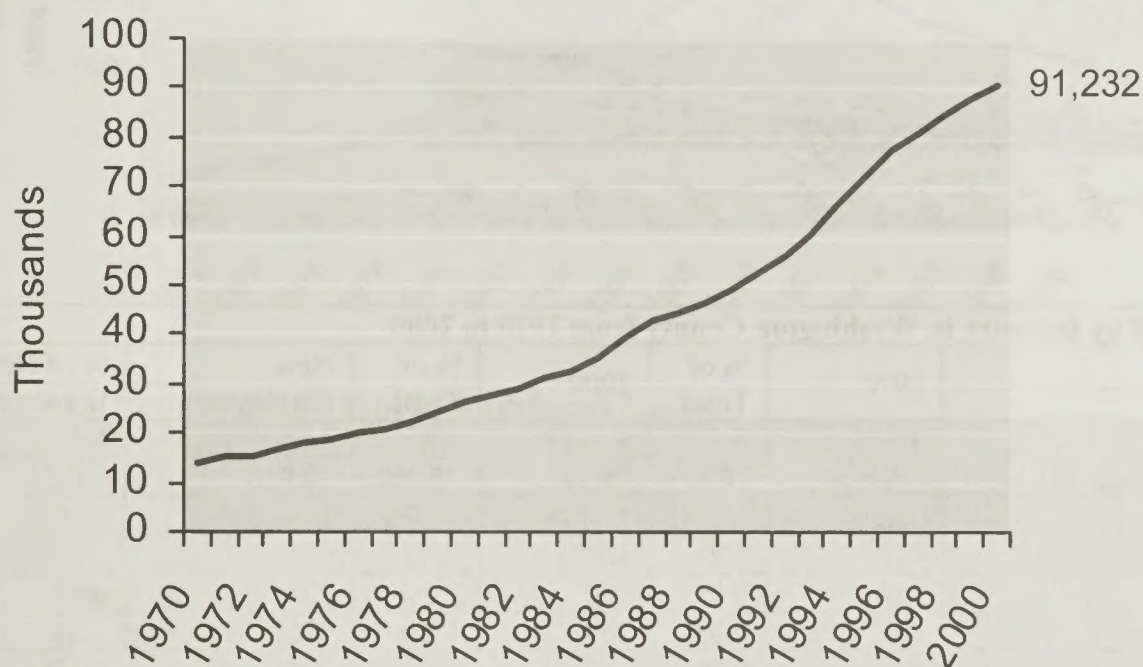
Washington County, Utah

Washington County is in the southwest corner of Utah. It is directly north of the western portion of the Planning Area. During the 1800's when no state line existed, the Arizona Strip was a natural extension of the early settlements in Washington County. Beginning in the 1850's, Mormon Pioneers settled in small communities along the Santa Clara and Virgin rivers in what is today Utah, Arizona, and Nevada. Farming and livestock raising were the predominate economic activities. The Planning Area provided a natural area for livestock grazing by providing pastures away from the growing communities. Many of the same families that

homesteaded and ranched in the Planning Area continue to graze livestock there and live in the cities and towns of southern Utah.

Today, Washington County is one of the fastest growing counties in the United States and the State of Utah. In 2000, the population of the county reached 91,232, which is a staggering 86.1 percent increase from the 1990 population of 48,564, and an increase of 556 percent since 1970. Figure 10 illustrates this rapid rate of increase. The County is expected to maintain its accelerated rate of growth, reaching 353,922 in 2030. Approximately 85 percent of the county's residents in 2000 live within the southern end of the county, near the border with Arizona, and thus in close proximity to the Planning Area. These communities include Hildale, Hurricane, Ivins, Santa Clara, St. George, and Washington, and are discussed in this section.

Figure 10. Population Growth in Washington County, Utah, 1970-2000 (Sonoran Institute 2003)



Washington County's civilian work force was 37,711 in 2000, with an unemployment rate of 5.5 percent. Per capita income was \$15,873, which was \$2,312 lower than Utah's and \$5,714 lower than the national average (see Table 3). The primary employment for county residents was sales and office occupations followed by service occupations. The major industries were educational, health and social services, followed by retail trade and construction. The arts, entertainment, recreation, accommodation, and food services industry accounted for only 12.9 percent of the jobs in the county. As a whole, however, the service and professional industry has increasingly dominated personal income in the County, as is illustrated in Figure 11 and Table 12.

Figure 11. Personal Income by Industry in Washington County, 1970-2000 (Sonoran Institute 2003)

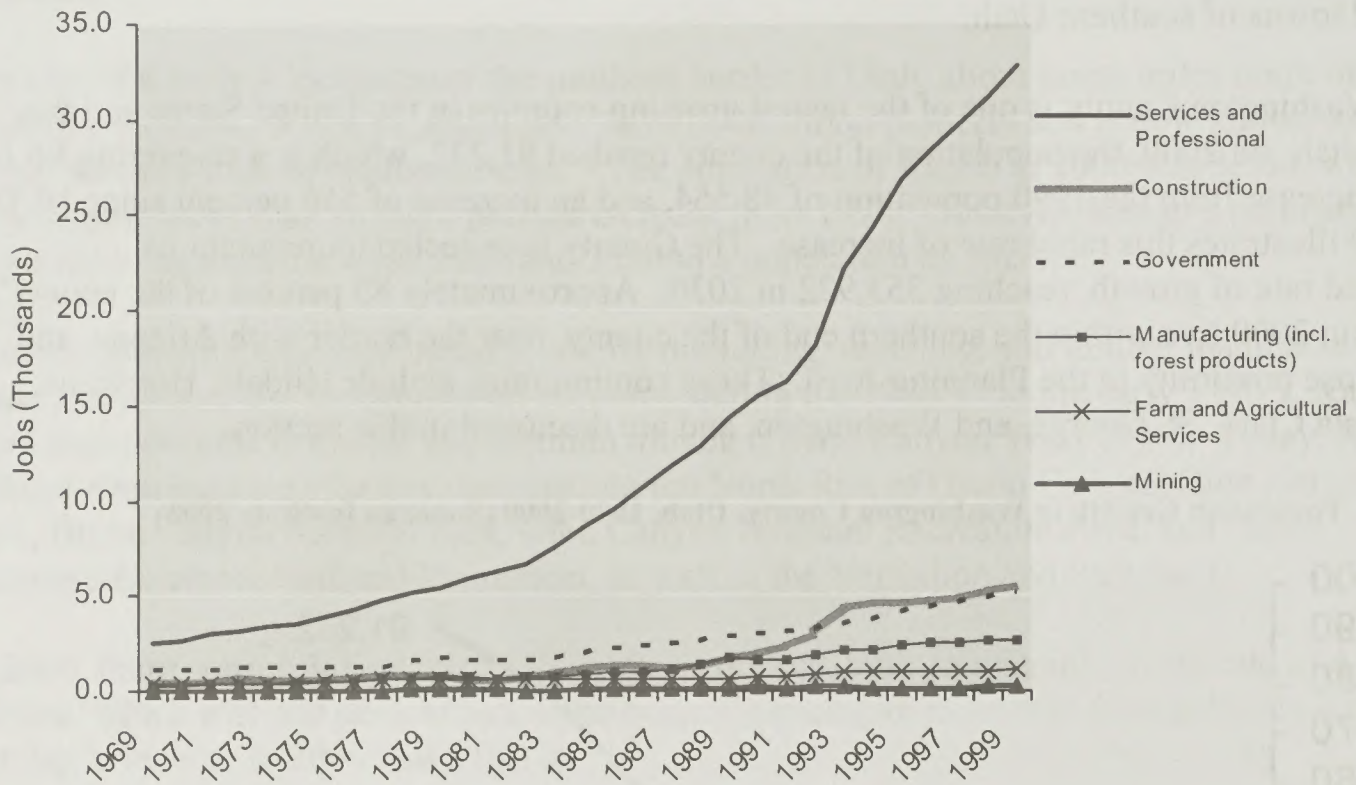


Table 12: Employment by Industry in Washington County from 1970 to 2000

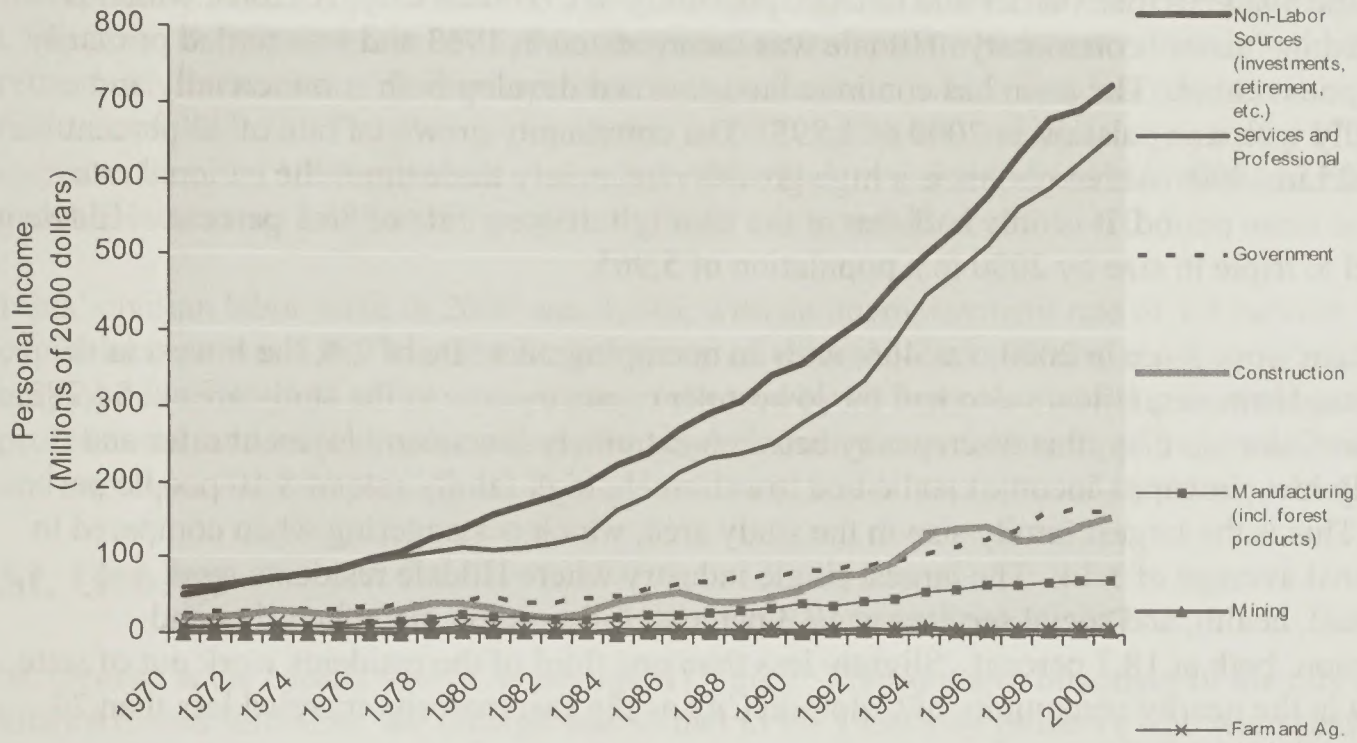
	1970	% of Total	2000	% of Total	New Employment	% of New Employment
Total Employment	4,819	NA	47,443	NA	42,624	NA
Wage and Salary Employment	3,699	76.8%	35,715	75.3%	32,016	75.1%
Self Employment	1,120	23.2%	11,728	24.7%	10,608	24.9%
Farm and Agricultural Services	428	8.9%	1,120	2.4%	692	1.6%
Farm	384	8.0%	560	1.2%	176	0.4%
Agricultural Services	44	0.9%	560	1.2%	516	1.2%
Mining	8	0.2%	213	0.4%	205	0.5%
Manufacturing (incl. forest products)	250	5.2%	2,634	5.6%	2,384	5.6%
Services and Professional	2,545	52.8%	32,780	69.1%	30,235	70.9%
Transportation & Public Utilities	112	2.3%	1,972	4.2%	1,860	4.4%
Wholesale Trade	211	4.4%	1,165	2.5%	954	2.2%
Retail Trade	1,142	23.7%	10,924	23.0%	9,782	22.9%
Finance, Insurance & Real Estate	282	5.9%	5,136	10.8%	4,854	11.4%
Services (Health, Legal, Business, Others)	798	16.6%	13,583	28.6%	12,785	30.0%
Construction	444	9.2%	5,553	11.7%	5,109	12.0%
Government	1,144	23.7%	5,143	10.8%	3,999	9.4%

Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing; Source: Sonoran Institute 2003

While the service and professional industry dominated the employment sources of personal income, more people were dependent upon non-labor sources of income. This source of income

has overtaken services and professional industry sources since about 1985, with the latter keeping pace in second place since then. This is illustrated in Figure 12 and Table 13.

Figure 12. Personal Income by Type in Washington County, 1970-2000 (Sonoran Institute 2003)



	1970	% of Total in 1970	2000	% of Total in 2000	New Income 1970 to 2000	% of New Income
Total Personal Income*	172	NA	1,727	NA	1,555	NA
Farm and Agricultural Services	11	6.2%	7	0.4%	-4	NA
Farm	10	5.7%	-1	-0.1%	-11	NA
Agricultural Services	1	0.5%	8	0.5%	7	0%
Mining	0	0.1%	7	0.4%	7	0%
Manufacturing (incl. forest products)	5	2.9%	71	4.1%	66	4%
Services and Professional	60	34.9%	662	38.3%	602	39%
Transportation & Public Utilities	4	2.3%	71	4.1%	67	4%
Wholesale Trade	8	4.4%	29	1.7%	22	1%
Retail Trade	25	14.7%	177	10.2%	151	10%
Finance, Insurance & Real Estate	4	2.4%	80	4.7%	76	5%
Services (Health, Legal, Business, Others)	19	11.1%	304	17.6%	285	18%
Construction	19	10.9%	153	8.9%	134	9%
Government	26	15.2%	162	9.4%	136	9%
Non-Labor Income	51	29.8%	728	42.2%	677	44%
Dividends, Interest & Rent	31	17.9%	427	24.7%	396	25%
Transfer Payments	20	11.9%	301	17.4%	280	18%

All figures in millions of 2000 dollars; Source: Sonoran Institute 2003
 The sum of the above categories do not add to total due to adjustments made for place of residence and personal contributions for social security insurance made by the U.S. Department of Commerce.

Hildale

Hildale is a small community in the southeastern corner of Washington County, located directly north of the Utah/Arizona border and in close proximity to Colorado City, Arizona, which is considered its “sister” community. Hildale was incorporated in 1963 and was settled primarily as a religious retreat. The town has continued to grow and develop both commercially and industrially with a population in 2000 of 1,895. The community grew at a rate of 43 percent from 1,325 in 1990. Although this is a high growth rate, nearly three times the national rate during the same period, it is only half that of the county’s 10-year rate of 86.1 percent. Hildale is projected to triple in size by 2030 to a population of 5,965.

The civilian work force in 2000 was 466, with an unemployment rate of 2.4, the lowest in the study area. However, Hildale also had the lowest per capita income in the study area at \$4,782. Similar to Colorado City, this discrepancy between extremely low unemployment rates and extremely low per capita income can be tied to extremely high family size of 8.10 people per family. This is the largest family size in the study area, which is staggering when compared to the national average of 3.14. The largest single industry where Hildale residents work was educational, health, and social services at 19.3 percent, followed by manufacturing and construction, both at 18.7 percent. Slightly less than one third of the residents work out of state, probably in the nearby community of Colorado City as the vast majority traveled less than 20 minutes to their work place.

Hurricane

The city of Hurricane is located in south central Washington County, about 10 miles north of the Utah state line. It began as a farming area for residents of other nearby communities and was incorporated in 1912. Hurricane’s population in 2000 was 8,250, which was an enormous 110.7 percent increase from the 1990 population of 3,915. The city is expected to continue growing, although not quite as rapidly, reaching a population of 18,351 in 2030. Growth in southern Hurricane will continue until it reaches the Arizona border and the Planning Area. A new reservoir, Sand Hollow, is on the southwestern side of town. Several golf courses and associated planned communities will be constructed near this reservoir. The southern belt route, a four-lane highway, is planned for construction in this area as well. It will lead to the new St. George Airport, projected to be completed in 2010, and connect to Interstate 15 at mile marker 2, just north of the Arizona border.

In 2000, there were 3,372 people in Hurricane’s civilian labor force, and the unemployment rate was 5.6 percent, and per capita income was relatively low at \$13,353. Roughly, one third of the residents worked in sales and office occupations, followed by 23.7 percent in management, professional, and related occupations. Retail trade was the largest industry, employing 20 percent of Hurricane’s work force, followed by educational, health and social services and construction, which employed 19.3 percent and 16.6 percent, respectively. The vast majority (95 percent) worked in state, commuting an average of 22.3 minutes to work, probably to St. George.

Ivins

Incorporated in 1935, the town of Ivins was originally a farm area for early settlers of the Santa Clara area. Incorporated in 1935, Ivins has become an upscale bedroom community and retirement destination with developments such as Kayenta, which emphasizes the natural features of the land. The town's population in 2000 was 4,450, which is an amazing 173 percent increase from the 1990 population of only 1,630. The town is expected to continue its rapid growth, increasing another 158 percent by 2030 to a population of 11,470.

Ivins' civilian labor force in 2000 was 1,946, with an unemployment rate of 4.5 percent. Per capita income was \$16,743. The largest group of workers, 28.3 percent, residing in Ivins was employed in sales and office occupations, followed by 24.2 percent working in management, professional, and related occupations. No single industry was dominant, with educational, health, and social services employing 16.8 percent of Ivins' residents, followed by retail at 16.5 percent.

St. George

St. George is the capital seat of Washington County. The southern boundary of the city is the Utah/Arizona state line. St. George was settled in the 1850's by pioneers who were sent to the area by their leader, Brigham Young and incorporated in 1862. With a population of 49,669 in 2000, a 74.2 percent increase from the 1990 population of 28,502, St. George is by far the largest community in the study area. The city is projected to grow to a population of 185,809 by 2030.

St. George's civilian labor force in 2000 was 21,442 and the unemployment rate was 6.1 percent, which was over one percentage point higher than the rate for Utah over the same period. St. George had one of the highest per capita incomes in the county at \$17,022. The types of occupations that employed the majority of St. George's work force were similar to that of Washington County, with no single industry dominating the workforce. Educational, health and social services was the largest industry employing 18.8 percent of the workforce, followed by retail trade employing 17.4 percent. Those living in St. George work fairly close to home, with 83 percent working in town and an average commute time of less than 15 minutes. Only three percent work out of state.

Santa Clara

Santa Clara was one of the first communities to be settled in southern Utah in the early 1850s when a group of Swiss settlers arrived in the area. The community was incorporated 1915 and is now considered a bedroom community of St. George. Santa Clara's population in 2000 was 4,630, an amazing 99.1 percent increase from the 1990 population of 2,322. The city is projected to grow another 153 percent by 2030 to a population of 11,710.

In 2000, Santa Clara had a civilian labor force of 3,019 and an unemployment rate of 3.2 percent, which was almost two percentage points below the Utah's unemployment rate. Per capita income for the city was \$15,975. However, family income was \$55,000, more than five thousand dollars above the national average, and household income was \$52,770, more than ten thousand dollars above the national average. The largest group of Santa Clara's residents, 33.1 percent, worked in management, professional, and related occupations, followed by 30.5 percent who worked in sales and office occupations. The largest industry was educational, health, and social services, which employed 22.4 percent of the population, followed by retail trade, which employed 17.1 percent of the population. The majority of the population worked close to their homes, with an average commute of 17.5 minutes, most likely to St. George.

Washington

Pioneer settlers sent to southern Utah to grow cotton during the Civil War founded the city of Washington and the area became known as "Utah's Dixie." The city was incorporated in 1870. In 2000, Washington had a population of 8,186, which was a 95 percent increase from 4,198 in 1990. The city is expected to continue its rapid growth in the future, with a projected growth of 124 percent to a population of 18,351 over the next 30 years.

Southern Washington is known as Washington Fields and is quickly converting from farmland to subdivisions. South of Washington Fields is the area called Little Valley, another newly developing bedroom community associated with St. George. It, too, is experiencing rapid growth and is located only 4-6 miles north of the Planning Area. Eventually the private and state lands in this area, in both Utah and Arizona, will become residential and commercial areas.

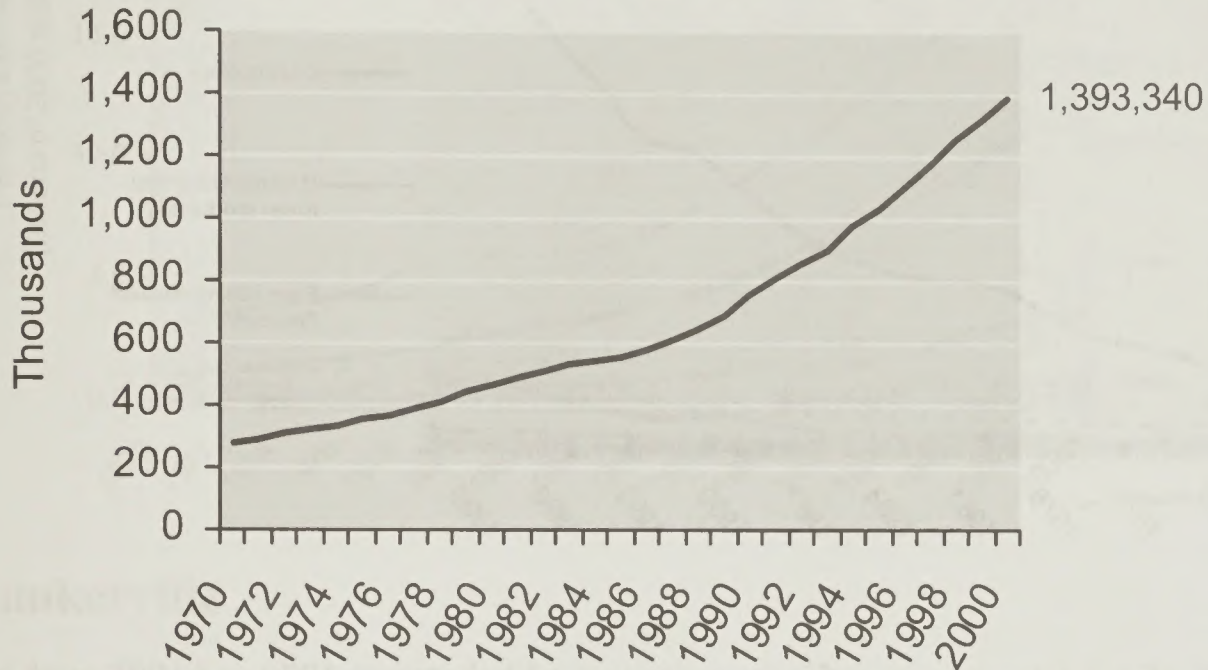
In 2000, Washington's civilian labor force consisted of 3,137 people. The unemployment rate was 4.7 percent, and per capita income was \$14,032. The largest percentage of the workforce, 25.7 percent, was employed in sales and office occupations, while 22.5 percent were employed in management, professional, and related occupations. The industry that employed the greatest percentage of workers was educational, health, and social services (22.1 percent), followed by retail sales (18 percent) and construction (15.7 percent). Ninety-eight percent of workers are employed in state, with 79 percent working in town. The average commute time was less than 14 minutes with most likely working in St. George. Recent commercial/retail growth since 2000, including the location of several big box retailers, has provided more employment and tax revenue to the town.

Clark County, Nevada

Clark County is located in Nevada's southern-most point and is the home of Las Vegas. Similar to Washington County, its neighbor, Clark County has recently been experiencing a phenomenal growth rate. Over the 10-year period between 1990 and 2000, the county grew by 85.5 percent, from 741,459 to 1,375,765 people, making Clark County the most populated county in the study

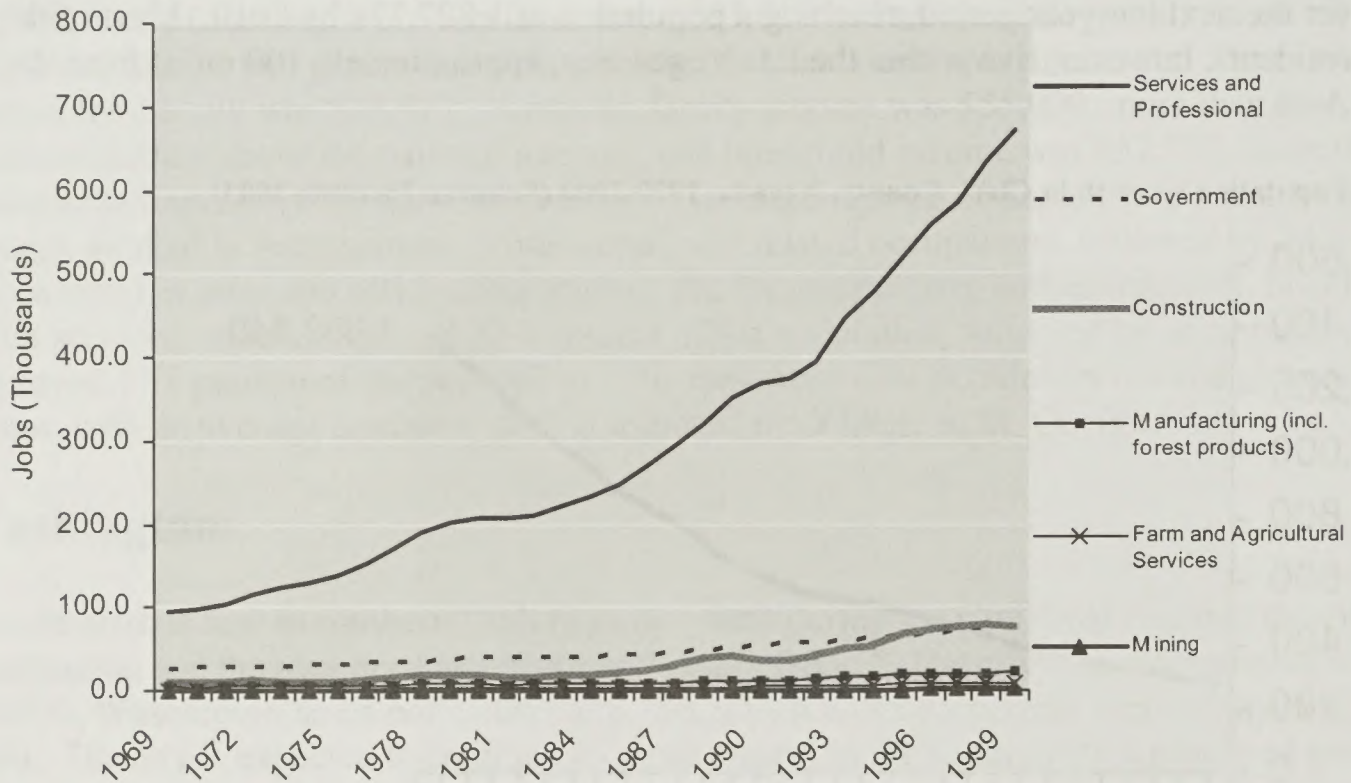
area. Figure 13 illustrates this rapid rate population growth. It is projected to grow another 32.9 percent over the next ten-year period, reaching a population of 1,827,770 by 2010. Most of the county's residents, however, live within the Las Vegas area, approximately 100 miles from the Planning Area.

Figure 13. Population Growth in Clark County, Nevada, 1970-2000 (Sonoran Institute 2003)



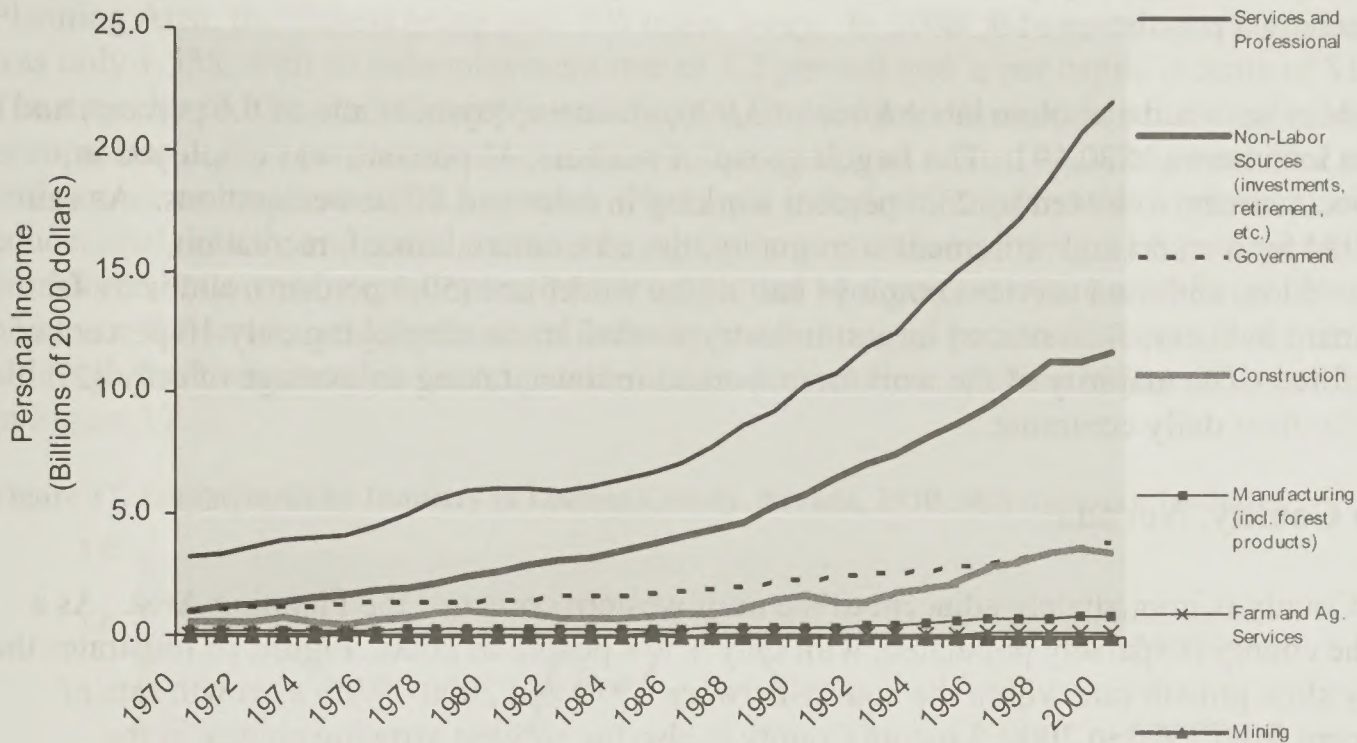
The civilian labor force in Clark County in 2000 was 682,073, with an unemployment rate of 6.6 percent, which is slightly higher than Nevada's unemployment rate of 6.2 percent and almost a percentage point higher than the national rate of 5.8 percent. Per capita income for the county was \$21,785, which is the highest in the study area and close to Nevada and national averages. The majority of Clark County's workforce is divided into three occupations: sales and office occupations at 27.9 percent; service occupations at 26.9 percent; and management, professional, and related occupations at 24.4 percent. The largest industry is the arts, entertainment, recreation, accommodation, and food services industry, which employ 30.1 percent of Clark County residents. This can be expected due to the influence of Las Vegas and surrounding area, which depends almost exclusively upon the entertainment industry. Figure 14 illustrates the rapid growth of jobs in the service and professional industry compared to other industries in from 1970 to 2000.

Figure 14. Employment by Industry in Clark County, Nevada, 1970-2000 (Sonoran Institute).



While the growth of non-labor sources of income grew steadily between 1970 and 1998, with a reduced growth rate between 1998 and 2000, employment sources from the service and professional industry was consistently the greatest contributor of personal income, as illustrated in Figure 15.

Figure 15. Personal Income by Type in Clark County, Nevada, 1970-2000 (Sonoran Institute).



Bunkerville

Bunkerville is a small community located on the Virgin River south of Interstate 15, just east of Mesquite. The town was one of the early Mormon farming settlements in the late 1800s. It had a population of 1,014 in 2000. Bunkerville’s workforce in 2000 was 479, with an unemployment rate of 6.3 percent, and a per capita income of \$16,820. Over one third of Bunkerville’s residents, 34.1 percent, were employed in service occupations, followed by 23.8 percent employed in sales and office occupations. The single largest industry is arts, entertainment, recreation, accommodation, and food services, which employed 40.8 percent of Bunkerville’s residents. This industry, however, is not located within the community as most of these employees, 95 percent, work out of town, but in state, and travel an average of 25.6 minutes to work. This suggests that majority of the workforce work in nearby Mesquite, where the economy is based on tourism due to numerous casinos, hotels, and resorts, as well as being an important stop for travelers on Interstate 15.

Mesquite

The city of Mesquite is a resort and retirement community located on the Virgin River and Interstate 15 next to the Nevada/Arizona border. The first attempts to settle the area occurred in the mid 1800’s and were unsuccessful due to flash floods. In 1884, six families from Bunkerville rebuilt the area and established the community. The building of Interstate 15 in the 1970’s ensured Mesquite’s success, allowing the city to incorporate in 1984. Today, the city is a popular resort and retirement area that hosts several casinos, hotels, and golf course communities. It is the fastest growing city in the study area and one of the fastest growing cities

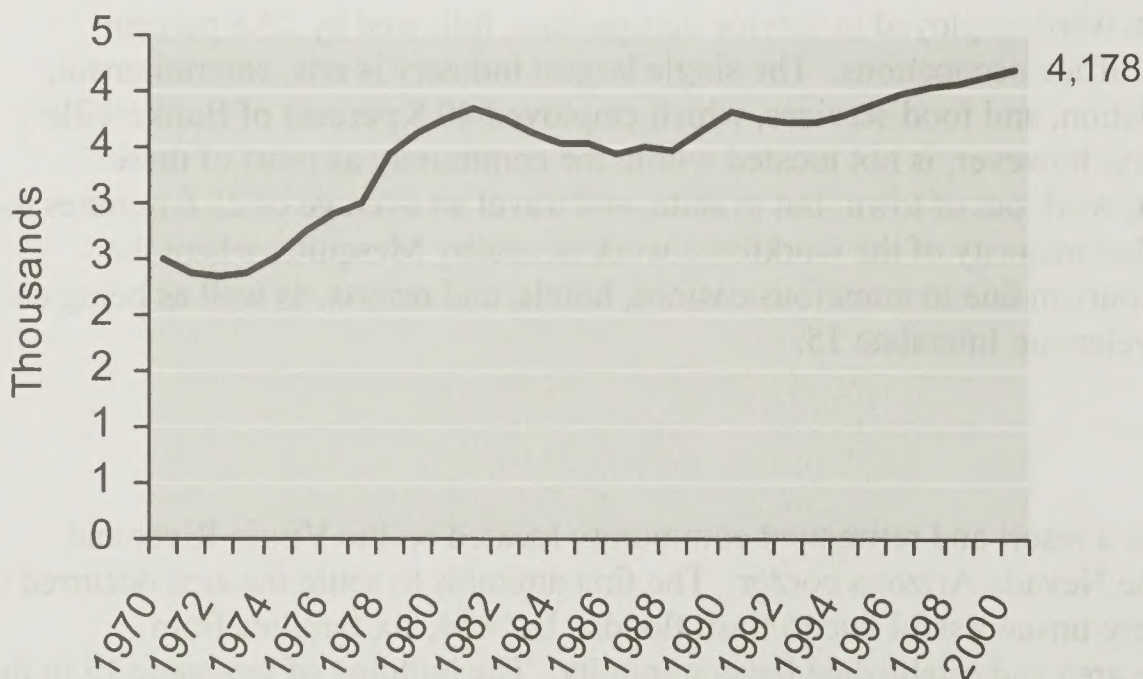
in the nation. In 1990, the population was 1,871, which grew by a phenomenal 401.8 percent by 2000, reaching a population of 9,389.

In 2000, Mesquite had a civilian labor force of 3,990, an unemployment rate of 6.6 percent, and per capita income was \$20,191. The largest group of workers, 42 percent, was employed in service occupations, followed by 23.6 percent working in sales and office occupations. As can be expected for a resort and retirement community, the arts, entertainment, recreation, accommodation, and food services employs half of the workforce (50.3 percent), and is by far the dominant industry. The second largest industry is retail trade, employing only 10 percent of the workforce. The majority of the workforce worked in town, taking an average of only 12.1 minutes for their daily commute.

Lincoln County, Nevada

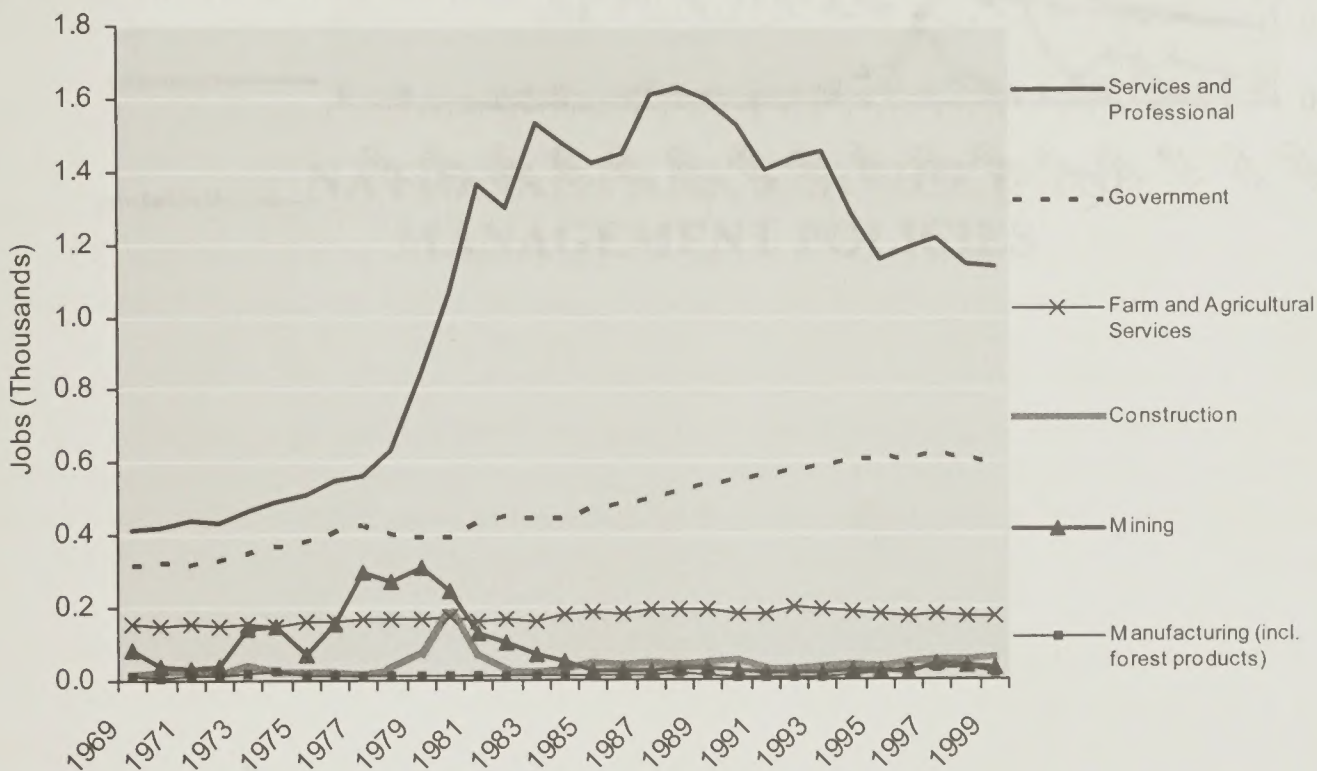
Lincoln County is immediately adjacent to the northwestern corner of the Planning Area. As a whole, the county is sparsely populated, with only 4,178 people in 2000. Figure 16 illustrates the relatively slow growth rate within the county between 1970 and 2000. With a growth rate of 10.3 percent from 1990 to 2000, Lincoln County is also the slowest growing county in the Planning Area, considerably slower when compared to neighboring Clark County. Based on current projections, Lincoln County is expected to grow even slower during the 10-year period between 2000 and 2010, at only 2.7 percent. However, passage of the Lincoln County Land Act could provide thousands of acres to be developed north of Mesquite and adjacent to the Planning Area within the next 20 years.

Figure 16. Population Growth in Lincoln County, Nevada, 1970-2000. (Sonoran Institute 2003)



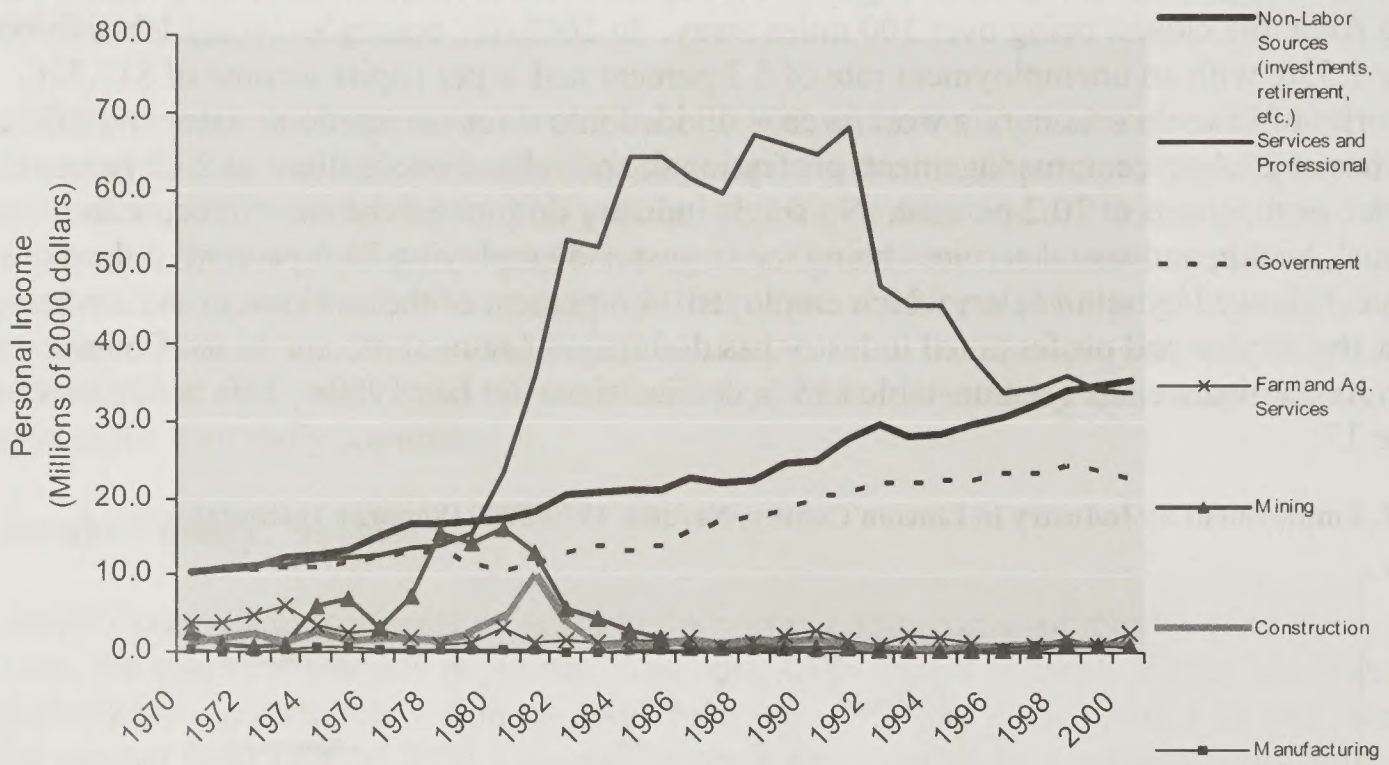
There are currently no communities in Lincoln County that are within close proximity of the Planning Area, the closest being over 100 miles away. In 2000, the county's civilian labor force was only 1,538, with an unemployment rate of 5.2 percent and a per capita income of \$17,326. The majority of Lincoln's County's workforce is divided into three occupations: sales and office occupations at 25.4 percent; management, professional, and related occupations at 25.2 percent; and service occupations at 20.2 percent. No single industry dominated the workforce, with educational, health, and social services being the largest and employing 21.5 percent of the workforce, followed by retail sales, which employed 14.6 percent of the workforce. As a whole, however, the service and professional industry has dominated personal income in the County, although its dominance has been unstable and in decline since the late 1980s. This is illustrated in Figure 17.

Figure 17. Employment by Industry in Lincoln County, Nevada, 1970-2000 (Sonoran Institute).



Services and professional occupations had also dominated the source of personal income for persons living in Lincoln County, but experienced a dramatic decline beginning in the early 1990s. In 2000, non-labor sources of personal income accounted for a greater proportion of personal income than service and professional sources. This is illustrated in Figure 18.

Figure 18. Personal Income by Type in Lincoln County, Nevada, 1970-2000 (Sonoran Institute).



National Park Service Management Policies (2001)

Throughout this plan, there are a number of statements, actions, and goals that apply specifically to National Park Service (NPS) lands. Often, these statements are prefaced with “Consistent with NPS policies.” The following selected NPS policies are listed here as references to those sections. The complete set of NPS Management Policies can be found online at www.nps.gov/policy/mp/policies.html.

4.1.5 Restoration of Natural Systems

The Service will re-establish natural functions and processes in human-disturbed components of natural systems in parks unless otherwise directed by Congress. Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to protect park developments or visitor safety. Impacts to natural systems resulting from human disturbances include the introduction of exotic species; the contamination of air, water, and soil; changes to hydrologic patterns and sediment transport; the acceleration of erosion and sedimentation; and the disruption of natural processes. The Service will seek to return human-disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated.

The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological-community structure and function. Efforts may include, for example:

- Removal of exotic species;
- Removal of contaminants and non-historic structures or facilities;
- Restoration of abandoned mineral lands, abandoned or unauthorized roads, areas over-grazed by domestic animals, or disrupted natural waterways and/or shoreline processes;
- Restoration of areas disturbed by NPS administrative, management, or development activities (such as hazard tree removal, construction, or sand and gravel extraction) or by public use;
- Restoration of natural soundscapes; and
- Restoration of native plants and animals.

When park development is damaged or destroyed and replacement is necessary, the development will be replaced or relocated so as to promote the restoration of natural resources and processes.

4.4.2.4 Management of Natural Landscapes

Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to

mitigate for excessive disturbance caused by past human effects, or to protect park developments or the safety of people using those developments. Landscape and vegetation conditions altered by human activity may be manipulated where the park management plan provides for restoring the lands to a natural condition. Management activities to restore human-altered landscapes may include, but are not restricted to:

- Removing constructed features, restoring natural topographic gradients, and revegetating with native park species on acquired inholdings and on sites from which previous development is being removed;
- Restoring natural processes and conditions to areas disturbed by human activities such as fire suppression;
- Rehabilitating areas disturbed by visitor use or by the removal of hazard trees; and
- Maintaining open areas and meadows in situations in which they were formerly maintained by natural processes that now are altered by human activities.

Landscape revegetation efforts will use seeds, cuttings, or transplants representing species and gene pools native to the ecological portion of the park in which the restoration project is occurring. Where a natural area has become so degraded that restoration with gene pools native to the park has proven unsuccessful, improved varieties or closely related native species may be used.

Landscape restoration efforts will use geological materials and soils obtained in accordance with geological and soil resource management policies. Landscape restoration efforts may use, on a temporary basis, appropriate soil fertilizers or other soil amendments so long as that use does not unacceptably alter the physical, chemical, or biological characteristics of the soil and biological community, and does not degrade surface or ground waters.

4.4.4.1 Introduction or Maintenance of Exotic Species

In general, new exotic species will not be introduced into parks. In rare situations, an exotic species may be introduced or maintained to meet specific, identified management needs when all feasible and prudent measures to minimize the risk of harm have been taken, and it is:

- A closely related race, subspecies, or hybrid of an extirpated native species; or
- An improved variety of a native species in situations in which the natural variety cannot survive current, human altered environmental conditions; or
- Used to control another, already-established exotic species; or
- Needed to meet the desired condition of a historic resource, but only where it is prevented from being invasive by such means as cultivating (for plants), or tethering, herding, or pasturing (for animals). In such cases, the exotic species used must be known to be historically significant, to have existed in the park during the park's period of historical significance, or to have been commonly used in the local area at that time; or
- An agricultural crop used to maintain the character of a cultural landscape; or

- Necessary to provide for intensive visitor use in developed areas, and both of the following conditions exist:
 - Available native species will not meet park management objectives; and
 - The exotic species is managed so it will not spread or become a pest on park or adjacent lands; or
- A sterile, non-invasive plant that is used temporarily for erosion control; or
- Directed by law or expressed legislative intent.

Domestic livestock such as cattle, sheep, goats, horses, mules, burros, reindeer, and llamas are exotic species that are maintained in some parks for purposes of commercial herding, pasturing, grazing, or trailing; for recreational use; or for administrative use for maintaining the historic scene or supporting park operations. The policies applicable to the grazing of commercial domestic livestock are discussed in chapter 8, section 8.6.8. The Service will phase out the commercial grazing of livestock whenever possible, and will manage recreational and administrative uses of livestock to prevent those uses from unacceptably impacting park natural resources.

8.6.8 Domestic and Feral Livestock

8.6.8.1 General

The NPS will allow livestock use only when the use is consistent with the criteria listed in section 8.2, and the use is either:

- Specifically authorized by a park's enabling legislation;
 - Required under a reserved right of use arising from the acquisition of a tract of land;
 - Required in order to maintain a historic scene; or
 - Conducted as a necessary and an integral part of a recreational activity appropriate to a park.
- Where livestock use (including cattle, sheep, goats, horses, mules, burros, reindeer, llamas, and alpacas) occurs in parks, it will be categorized as
- a) livestock operations,
 - b) recreational stock,
 - c) trespass animals, or
 - d) feral herds.

No livestock use or activity, regardless of how authorized, will be allowed that would cause unacceptable impacts to a park's resources, values, or purposes. In particular, livestock use that depletes or degrades non-renewable resources, or whose effects cannot be satisfactorily mitigated, will not be allowed.

8.6.8.2 Managing the Use

Where domestic or feral livestock use occurs, the National Park Service will foster “best management practices” that protect vegetation, and wildlife and its habitat; safeguard sensitive species; control proliferation of exotic species; conserve soil; protect riparian areas and ground water; avoid toxic contamination; and preserve cultural sites. Integrated pest management methods and pesticide use on and around livestock must comply with NPS pest management policy in section 4.4.11. Livestock may be used as part of an integrated program to control exotic plants.

The National Park Service must manage its resources in a manner that conserves them for future generations. Park uses, including domestic and feral livestock, which may jeopardize the sustainability of a park’s natural and cultural resources must be evaluated continuously. Livestock, including trail stock, will be kept within the carrying capacity of the area to be used.

Managers must regulate livestock so that ecosystem dynamics, and the composition, condition, and distribution of native plants and animal communities, are not significantly altered or otherwise threatened, and cultural values are protected. Conflicts with public use and enjoyment must be kept to a minimum.

The use of pack-in feed, preferably pellets, is encouraged for all recreational stock while on the trail, and is required whenever grazing would have unacceptable impacts on a park’s resources.

When not being actively used for recreation in a park, livestock will either be removed from the park or be confined within an appropriate corral or other structure, and it will be fed pelletized feed or hay that is free of weed seeds.

Livestock activities must be discontinued whenever they would be disallowed by the criteria listed in section 8.2.

In parks with legislation that states that livestock use is administered by another agency, the superintendent will work closely with the other agency to manage the amounts and types of use, and to ensure that the best management practices are followed. Administration by another agency does not release the NPS from its responsibility to ensure that the activity is managed in compliance with the NPS mission and all applicable laws and policies.

8.6.8.3 Management Plans

Each park that allows domestic or feral livestock, including parks where the livestock use is administered by another agency, will prepare a livestock management plan designed to sustain and protect park resources and values. Restrictions will be placed on the amount and type of use to protect resources and values, and to minimize conflicts with visitors.

Particular attention will be given to protecting wetland and riparian areas, sensitive species and their habitats, water quality, and cultural resources. Natural and cultural resource protection will be given first priority when determining livestock management priorities. A monitoring program must be implemented, and will be used to detect change and adjust management to protect resources.

Plans will include an evaluation of impacts as directed by NEPA and NHPA. Benefits and impacts must be carefully weighed. A rigorous assessment is especially important for areas with unique natural and cultural resources, low precipitation, limited vegetation cover, water quality concerns, highly erodible soils, or sensitive species. Areas that have been continuously grazed for long periods, or that are in poor ecological health, will require special emphasis in the plan.

Until a plan is completed for livestock operations or recreational stock, environmental impact analysis will be done when the permitting document is issued or renewed.

8.6.8.4 Permitting Instruments

Livestock activities by parties other than the NPS will be conducted only pursuant to the terms and conditions of a special use permit, lease, concession contract, or commercial use authorization. The use of a lease (versus some other instrument) is appropriate only when (1) specifically authorized by the park's enabling legislation; or (2) it is part of an historic preservation program authorized by 16 USC 470h-3; or (3) the livestock use is associated with a building that is leased pursuant to 16 USC 1a-2(k).

In addition to any other penalty provisions, violation of the terms and conditions of the permitting instrument may result in revocation of the livestock use privilege. In parks where the NPS shares livestock allotment management with another government agency, or where another government agency, through legislation, administers the use, a general agreement between agencies is necessary to describe the relationship and responsibilities.

8.6.8.5 Structures

No structures except those specifically authorized by law or approved by the National Park Service will be allowed in parks to increase livestock numbers, sustain livestock in areas in which they cannot otherwise be sustained, or introduce livestock into areas that previously have not been open to livestock. The Service will not expend funds to construct or maintain livestock structures unless there is a direct benefit to the protection of park resources. The permittee may be required to remove structures when livestock activities are no longer authorized.

APPENDIX 4.B

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO FOR OIL AND GAS ON THE ARIZONA STRIP

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO FOR OIL AND GAS ON THE ARIZONA STRIP

I. Summary

For the Arizona Strip District Office (Arizona Strip DO), on average, one Application for Permit to Drill (APD) is received per year. It is predicted this level of activity will continue for the next 20 years. Historically, approximately seven acres (including wells, roads, infrastructure) is disturbed per well by oil and gas drilling operations.

This Reasonably Foreseeable Development (RFD) Scenario for Oil and Gas contemplates that oil and gas exploration will be the only activity undertaken and if an economic occurrence is developed additional analysis will be needed. Consequently, reclamation would take place immediately following drilling. Complete reclamation normally takes a maximum of 10 years, given this scenario the greatest area disturbed at any one time by oil and gas exploration would be 70 acres.

II. Introduction

The policy for RFD was updated by WO IM No. 2004-089 to incorporate revised guidance for preparing RFD scenarios in support of land use planning and National Environmental Policy Act (NEPA) analysis.

The Arizona Strip District of the Bureau of Land Management (BLM) is currently in the process of preparing Resource Management Plans for the Grand Canyon-Parashant National Monument (Parashant), the Vermilion Cliffs National Monument (Vermilion) and the Arizona Strip DO. This RFD will consider events that may occur on the Arizona Strip DO, as the National Monuments are closed to mineral leasing, subject to valid existing rights, and no leases are currently issued within the Parashant and Vermilion.

This assessment is based on a review of both published and unpublished literature and information on the geology, structure, economic geology and oil and gas occurrences of the Arizona Strip DO that are available to the author. Consideration was also given to the plate tectonic and regional paleogeographic setting of the Arizona Strip DO within the central Cordillera and the resulting implications on oil and gas resource potential. This report was prepared with information available up until July 2004.

III. Description of Geology

The Arizona Strip DO lies within the Basin and Range, and Colorado Plateau physiographic provinces (Hayes, 1969). The Basin and Range province extends to the west from the Grand

Wash Cliffs fault zone to the Nevada border and is characterized by narrow northerly trending mountain ranges separating sediment filled basins created during a complex history of thrusting and folding, followed by rifting, volcanism and block faulting. The Colorado Plateau province occupies the area east of the Grand Wash Cliffs fault zone and is characterized by predominantly horizontal stratified sedimentary rocks eroded into a highly dissected landscape comprised of broad, high plateaus and mesas and intervening steep-walled canyons.

The Basin and Range mountains are tilted and sometimes deformed blocks of Precambrian, Paleozoic, Mesozoic and Cenozoic rocks. The mountain ranges are bounded by steeply dipping faults and often expose Precambrian crystalline core complexes. The Paleozoic rocks are predominantly marine limestones, shales and sandstones that were deposited on a shallow marine shelf in the Early Paleozoic and deeper basins in the Late Paleozoic. Mesozoic rocks are poorly exposed nonmarine sediments and have been mostly eroded away. Cenozoic rocks consist of volcanic, nonmarine fluvial and lacustrine sediments. The intervening basins have subsided thousands of feet and are filled with Cenozoic volcanics, alluvium and lacustrine sediments.

Precambrian crystalline rocks are exposed on the Colorado Plateau in the bottom of the Grand Canyon. Proterozoic rocks on the Colorado Plateau are dominantly clastic sedimentary rocks with minor amounts of limestone and basaltic lavas that were deposited in shallow marine waters and near shore terrestrial environments (Shride, 1967). Paleozoic rocks above the great unconformity, which marks the boundary between the Precambrian and Cambrian periods, consist of shallow marine and continental sediments deposited in the Rocky Mountain geosyncline during periods of repeated transgressions and regressions. During the Mesozoic, that portion of the Arizona Strip DO lying in the Colorado Plateau remained relatively low and stable. Mesozoic rocks are predominantly nonmarine red beds deposited in lacustrine, fluvial, distal fluvial/playa and eolian environments. During the Cenozoic tectonism reactivated northerly trending faults and produced igneous activity that resulted in pyroclastic deposits and extensive basalt flows.

On the Colorado Plateau structural features are typified by broad areas of flat-lying to gently tilted strata bounded by monoclines and (or) high-angle faults. The combined thickness of upper Proterozoic through Mesozoic rocks is in excess of 12,000 ft. (Hintze, 1973). The thickness of these formations increases to the northwest near the Paleozoic hingeline and Rocky Mountain geosyncline. Potential source rocks for hydrocarbons include the Proterozoic Chuar Group in the eastern portion of the Arizona Strip DO (Reynolds and others, 1988). Good oil and gas source rocks in the Paleozoic section appear to be sparse in the Colorado Plateau province of Arizona (Ryder, 1983). Paleozoic source rocks of secondary importance possibly include Pennsylvanian-Permian Supai dolomites and evaporites (Ryder, 1983). Oil and gas accumulations on the Arizona Strip DO could be the result of migration from as far west as the Paleozoic hingeline. On the Arizona Strip DO first-order structural features include the Echo Cliffs and Kaibab uplifts (Ryder, 1983). Oil and gas resources that may underlie the Arizona Strip DO will probably occur in structural or stratigraphic traps within rocks of upper Proterozoic through Triassic age.

Cenozoic erosion, however, tends to lower the potential for hydrocarbon accumulations occurring in the southern portion of this area due to possible ground water flushing.

The U.S. Geological Survey (USGS) includes the Arizona Strip DO in the northern Arizona petroleum province. No Known Geologic Structures or Known Leasing Areas exist in the Arizona Strip DO and no USGS or other play descriptions have been assessed.

IV. Past and Present Oil and Gas Exploration Activity

A records search for geophysical exploration activity in the Arizona Strip DO from central files and from the BLM national database LR2000 showed some seismic and gravity surveys were conducted during the late 1970s and early 1980s. Presently in the Arizona Strip DO, thirty-one oil and gas leases are authorized by the BLM that encompass approximately 83,000 acres.

Hydrocarbon surface seeps confirm the existence in the subsurface of organic-rich rocks capable of generating oil and gas. Rauzi (2001) lists seven surface occurrences of oil seeps and petroliferous rocks in the Arizona Strip Field office.

To date, no economic occurrences of oil and gas have been encountered in wells drilled in the Arizona Strip DO. The Arizona Strip DO has been only lightly explored for these resources with 55 wells having been drilled on the Arizona Strip to date. Most of the wells in the Arizona Strip DO are relatively shallow with only 30 wells drilled more than 1000 feet and the deepest being 7070 feet. Oil and gas shows have been reported from many of the wells, primarily from rocks of Permian age, but also from rocks as old as Devonian. Only 3 of the wells were drilled in the Basin and Range province the rest were drilled in the Colorado Plateau province.

V. Past and Present Oil and Gas Development Activity

To date, there has been no oil and gas development activity in the Arizona Strip DO. Approximately 15 miles north of the Arizona-Utah border, oil production had been established in the now-abandoned Virgin field. Production was from the Timpowep Member of the Triassic Moenkopi Formation. The average depth of the field is 580 feet (Pierce and others, 1970). Approximately 50 miles north of the Arizona-Utah border, strata equivalent to the Kaibab Formation (Permian) produced more than 20 million barrels of oil in south-central Utah from the Upper Valley field (Rauzi, 2001)

VI. Oil and Gas Occurrence Potential

Ryder (1983) rated the oil and gas potential of Arizona. Within the Arizona Strip DO a moderate potential for these resources was assigned to the north central and extreme western portions of the area. This rating was based on numerous oil shows reported from wells and the location of the tracts in relation to the Paleozoic hingeline. In the north central portion of the Arizona Strip

DO, consideration was also given to that areas location in relation to the Virgin oil field in southwest Utah. In both areas, Ryder speculated that any hydrocarbons present would have migrated into the area from the Rocky Mountain Geosyncline lying to the west. Heylmun (1987) rated the Arizona Strip as having a good potential for oil accumulations in northwest striking anticlinal folds and other structural traps located away from major fault zones. Good potential was also assigned to the Shnabkaib Member of the Moenkopi Formation and the Toroweap Formation where stratigraphic traps may exist. Rauzi (2001) rated the Arizona Strip as having fair to good potential for trapped hydrocarbons based on a combination of surface seeps, petroliferous rocks, and shows of oil and gas in numerous wells in north-western Arizona, plus oil production from equivalent units in southwestern and south-central Utah. Thus, it would appear the many thousands of feet of deep marine basin sediment that lie in and west of the Arizona Strip DO provide at least a moderate potential for the origination and possible migration of hydrocarbons into the area. Reynolds and others (1988) have recently recognized the Proterozoic Chuar Group as a potential source rock in northern Arizona.

Those areas identified by Ryder (1983) as having moderate potential for hydrocarbon accumulations have been carried forth here (See Map 3.29). Oil and gas accumulations that may underlie the Arizona Strip DO will probably occur in structural or stratigraphic traps within rocks of upper Proterozoic through upper Paleozoic age. The certainty that oil and gas exists in this area is supported by direct evidence in the form of hydrocarbon surface seeps, and oil and gas shows in wells. The evidence is, however quantitatively minimal to support or refute the existence of a mineral resource. Cenozoic erosion along the major drainages crossing the Arizona Strip would tend to lower the potential for the preservation of hydrocarbon accumulations due to probable ground water flushing. Thus, most of the southern and eastern portion of the Arizona Strip DO is rated as having a low potential on this basis. The certainty that oil and gas resources do not exist in this area is supported only by indirect evidence.

VII. Oil and Gas Development Potential

Oil and gas activities in the Arizona Strip DO are sporadic and limited to exploration only. No problems are expected with development of any oil and gas resources found and no trends in exploration have arisen.

VIII. RFD Baseline Scenario Assumptions and Discussion

The Arizona Strip DO encompasses approximately 3,323,091 acres including lands under different ownerships (Federal, State, and private). Of this approximately 206,809 acres (6%) are under State ownership and approximately 139,612 acres (4%) belong to private owners. Of the 55 well that were drilled four were located on private surface and one of the four was on non-federal subsurface; five were drilled on State lands and one of the five was drilled on federal subsurface.

Areas designated as closed to leasing by law, regulation or executive order, include wilderness areas and national monuments, and comprise approximately 1,422,724 acres (about 43%) of the lands administered by the Arizona Strip DO. The present Resource Management Plan identifies approximately 98,375 acres (about 3%) as open to leasing with no surface occupancy, and approximately 185,807 acres (about 5%) open to leasing subject to seasonal restrictions or special terms and conditions. The remaining approximately 1,616,106 acres (about 49%) are open to lease under standard lease terms and conditions. Only one of the exploration wells was drilled in an area that is now closed to leasing and two wells were drilling in areas now subject to seasonal restrictions or special terms and conditions. The rest of the oil and gas wells were drilled in areas open to lease under standard lease terms and conditions.

Exploration operations have taken place sporadically over the years with increased activity during the 1950s, 1960s and 1980s. Since the 1980s, 22 exploration oil and gas wells have been drilled on the Arizona Strip and it seems reasonable to assume this level of activity (approximately 1 well per year) can be anticipated for the future.

IX. Surface Disturbance Due to Oil and Gas Activity On All Lands

About 55 oil and gas exploration wells have been drilled on the Arizona Strip beginning with the first well in 1909. None of these wells have produced oil or gas in paying quantities, though oil and gas shows have been reported from a many of the wells. Disturbance caused by each well, including access, typically ranges between five and ten acres. Assuming an average of seven acres disturbed per well, approximately 385 acres have been disturbed because of oil and gas exploration. Typical well drilling operations last up to four months, though deeper wells may take longer. Since no oil or gas has been produced from this area, all disturbances have been reclaimed immediately following exploration. Complete reclamation of the disturbance requires from five to ten years.

Presently, there is one ongoing oil and gas well drilling operation that is not reclaimed. The operation is sporadically active and bonded to ensure reclamation. Approximately, five acres is disturbed by roads and the drill pad for the current oil and gas drilling operation. Reclamation of this operation probably will commence in the next six months.

Given the assumption that, on average, one APD will be received per year for the next 20 years and approximately seven acres will be disturbed per well by oil and gas drilling operations, the total area of related disturbance during this time period would be 140 acres. Lacking substantive data on oil and gas resources that may underlie the Arizona Strip, it is difficult to assess the potential for discovering an economic occurrence of oil and gas. However, for this RFD and planning purposes the assumption is made that exploration will be the only activity undertaken and reclamation will be done immediately following drilling. If complete reclamation takes 10 years, the maximum area disturbed at any one time would be 70 acres.

X. References

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XI. Statement of Qualifications

The author,
Rody P. Cox Jr., has a Masters of Science degree in Earth Sciences from Case Western Reserve University in Cleveland, Ohio and is a licensed Profession Geologist with the State of Utah, License No. 5207898-2250. His geological experience spans more than 20 years with private industry and the US Federal government.

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APPENDIX 4.C

NATIONAL PARK SERVICE IMPAIRMENT ANALYSIS

NATIONAL PARK SERVICE IMPAIRMENT ANALYSIS

As noted earlier in this Draft Plan/DEIS, impairment analysis is required only for the National Park Service (NPS) portion of the Parashant. While the BLM is mandated by the national monument proclamations to protect objects in the Monuments and thus avoid any adverse impacts that would otherwise “impair” such objects, the agency is not required to conduct impairment analysis.

In the sections which follow, the legal framework which mandates that the NPS conduct impairment analysis is first outlined. Applicable federal statutes and NPS policies which bear on this issue are listed and a discussion of how this approach is linked to the NEPA process is presented. That discussion is followed by an overview of accepted general approaches that may be applied to impairment analysis and the factors that must be considered in determinations of resource impairment. These sections are taken almost directly from the NPS Interim Technical Guidance on Assessing Impacts and Impairment to Natural Resources (2003) and, not surprisingly, apply largely to natural resources. A short section follows that covers the consideration of impairment of cultural resources. Finally, the results of impairment analyses of proposed management programs under the various alternatives on cultural and natural resources within the NPS portion of the Parashant are presented.

FRAMEWORK FOR DECISION-MAKING

Legal Framework

The National Park Service Organic Act of 1916 states that the NPS:

“...shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified...by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations (emphasis added).”

Congress reaffirmed this mandate in 1978 when it directed the following:

“The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.”

In addition to avoiding impairment, NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. Nonetheless, these laws do give the NPS the management discretion to allow certain impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values.

The no-impairment mandate of the Organic Act is one of many legal requirements managers must consider and comply with when authorizing activities in parks. In some cases, requirements of other environmental laws and regulations might prohibit certain impacts on natural resources or values, whether or not “impairment” might result. In other cases, impacts technically allowed under other laws might be prohibited in a park because they would be considered impairment. In general, the most stringent test should be applied prior to approving an activity.

The Wilderness Act of 1964 (16 U.S.C. 1131, et seq.) defines wilderness as:

“an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain . . . an area of undeveloped Federal Land retaining its primeval character and influence . . . which is protected and managed so as to preserve its natural conditions” (16 U.S.C. 1131(c)).

In many cases the specific language of the Wilderness Act may prohibit activities before an impairment determination must be made, thereby making an impairment decision unnecessary. In other cases, the Wilderness Act may provide supporting legal context which makes it easier for managers to arrive at an impairment determination.

NPS Management Policies

NPS Management Policies 2001 leave determinations of impairment to the responsible park manager and direct that an action should be considered to constitute impairment only if, in the manager’s professional judgment, the action “would harm the integrity of the park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.” NPS policies (Section 1.4.5) further state that whether an impact meets this definition (i.e., would harm the integrity of the park resources or values) depends on:

- 1) the particular resources and values that would be affected;
- 2) the severity, duration, and timing of the impact;
- 3) the direct and indirect effects of the impact; and
- 4) the cumulative effects of the impact in question along with other existing impacts.

The current management policies do not state what would be acceptable or not acceptable (i.e., to constitute impairment) under any of these factors. It is left to the manager to assess information on each of these factors, weigh that information, and use professional judgment to decide if the integrity of the park resources or values will be harmed by the action.

An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is

- 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park,
- 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- 3) identified as a specific goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute impairment to the extent that it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values.

Impairment may occur from visitor activities, NPS activities in the course of managing a park, or activities undertaken by concessionaires, contractors, and others operating in the park as well as from external actions. Impairment can occur from inaction as well as action. For example, failure to prevent the spread of a seriously disruptive alien species may impair park resources.

Linkage to NEPA

The National Environmental Policy Act (NEPA) of 1969 requires agencies, including NPS, to assess the impact of proposals on the quality of the human environment. NPS makes an impairment determination through the environmental planning and assessment process. NPS Director's Order #12 states that environmental documents will evaluate and describe impacts that may constitute an impairment of park resources or values. In addition, the Record of Decision will summarize impacts and whether or not such impacts may constitute an impairment of park resources or values. The NPS NEPA Handbook (January 2001) provides additional guidance on how projected impacts are to be described and characterized based on their magnitude, context, duration, and intensity. NPS Management Policies direct decision-makers to "consider any environmental assessments or environmental impact statements required by NEPA; relevant scientific studies and other sources of information; and public comments" in making impairment determinations. The NEPA Handbook indicates that the impact assessment should lay out a methodology for assessing each impact topic, including the criteria or thresholds used to draw a conclusion on the context, intensity, and duration of the impact. Based on these assessments, impacts may be characterized as "negligible," "minor," "moderate," or "major." These impact characterizations, in turn, provide a foundation for assessing whether the impact is likely or not likely to result in an impairment of park resources or values.

Not all major or significant impacts under a NEPA analysis are impairments. Nonetheless, all impairments to NPS resources and values would constitute a major or significant impact under NEPA. If an impact would result in impairment, the action should be modified to lessen the

impact level. If the impairment cannot be avoided by modifying the proposed action, that action cannot be selected for implementation.

Impact levels (also referred to as impact thresholds in Director's Order #12) are used to identify the impacts of the action to resources and may assist in making either resource specific or overall impairment determinations. These impacts need to be placed into context (e.g., the park's enabling legislation, specific laws governing endangered species, publicly reviewed planning documents, or other considerations) to make a decision as to whether or not the impacts are acceptable or unacceptable.

Determinations of whether an impact constitutes impairment are a management decision. Thus, conclusions in NEPA documents that there would be impairment to a specific resource type should only be made in consultation with the park manager or other decision-maker. Staff members and technical experts should be encouraged to offer their expertise and opinions, but staff members are not always aware of all the facts of a situation or the full context in which a decision must be made. Ultimately, park managers will need to determine whether or not the impact is the unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values.

NPS Management Policies also direct the NPS to demonstrate environmental leadership in all aspects of park planning. In this, the NPS is required to seek opportunities for achieving the highest standards for environmental protection and for implementing sustainable practices. Park managers should consider impacts and the potential for impairment against these benchmarks. Moreover, the environmental leadership management policy directs the NPS to comply with both the letter and the spirit of NEPA.

GENERAL APPROACHES TO IMPAIRMENT

Management Context

Impairment decisions also need to be put into context. This means considering the action within the context of the purposes for which the park was established, the management objectives, and desired future conditions. One should also consider existing conditions in the park, the relative impacts from activities within and outside the park, and the incremental and cumulative effect of potential impacts from a proposed or ongoing activity. When deciding whether impacts might constitute impairment, park managers should remain cognizant of the effect such decisions might have on their ability to protect park resources and values from impacts caused by activities outside park boundaries. Neighboring land managers and land owners, as well as private entities farther upwind or upstream, may want the NPS to judge the acceptability of the impacts they cause within parks the same way we judge our own activities.

Lack of Information and Risk Assessment

Managers and decision-makers must have adequate information upon which to base their analysis and decisions regarding potential impacts or impairment. The appropriate level of detail needed is related to three factors commonly used in risk assessments to describe probability or likelihood of an impact: the magnitude of the action, the probability of making a wrong decision, and the consequences of the action.

Magnitude of the action: Large or complex projects require more information to inform impact assessments than small simple projects.

Probability of a wrong decision: There is always a possibility that a wrong decision will be made and negative unintended impacts or consequences will result. However, the better the information used for decision-making, the less likely it is that unintended or unanticipated impacts will occur.

Consequences of the action: The potential impact of an activity on one or more resources may also drive the amount of information needed for analysis and decision-making. If the potential consequences of an action are irreversible, then the amount of information needed might greatly increase, because the risk would be higher.

These three factors interact in a manner that influences the amount of information needed for an impact assessment or impairment determination. For example, a small project with minimal long-term consequences may not require a lot of information, even if there is a high likelihood that we will make the wrong decision. Conversely, an action where impacts are highly predictable and the action is likely to go as planned may require much more information if that action is irreversible or has serious consequences such as potentially extirpating a species.

Professional Judgment

Professional judgment of the decision-maker and staff is a critical tool in assessing impact and impairment. It is impractical to expect to have independently gathered monitoring data and analyses on every resource issue. Judgments must be made using the combined education and work experiences of professional staff. However, these judgments need to be documented so that decisions can be revisited in the future as more information is acquired or as conditions change.

Impairment Determination Considerations

Some, but not all, major impacts to natural resources may be an impairment, depending on the severity, duration, and timing of the direct, indirect, and cumulative impacts and on the park purpose, management objectives and context. Impacts determined to be negligible, minor, or moderate are not as likely to lead to impairment, but may do so in rare cases (e.g., the integrity of a park's spectacularly dark night skies might be considered harmed by a relatively small increase

in artificial illumination). In practice, if a manager concludes there might be or is an impairment from an impact not characterized as “major,” she or he should carefully re-examine the impact analysis to see if the impact has been characterized appropriately.

Although there are no canned methodologies that can be applied to determine impairment, there are a number of steps that should be taken in all evaluations:

- 1) Gather sufficient available information to adequately inform decision making (see “Information Needs” in each resource section).
- 2) Use or develop conceptual, physical or mathematical models of resource and ecosystem relationships to help evaluate or predict potential impacts (particularly for indirect and multiple-resource effects).
- 3) Conduct a thorough assessment following all potential impacts over time and space to their logical conclusions (e.g. consider all life stages and functions of species, consider whether an action may be irreversible).
- 4) Quantify the impacts as much as possible (see “Impact Level” tables in each resource section to help determine what should be quantified).
- 5) Determine if the impacts analyzed in the steps above constitute an impairment of park resources and values by evaluating the context in which each specific resource impact decision will be made (see “Laws Regulations and Policies” in each resource section of this guidance, as well as considering the uniqueness of the impacted resource, and any park specific purposes, management objectives and context).
- 6) Document the decision and the logic that led to the decision.

Most proposed actions are not expected to have impacts to park resources that would rise to the level of “impairment.” The impacts of actions will range from clear instances of no impairment, to obvious impairment, and to in-between situations where it will be difficult to determine impairment or non-impairment. A determination of impairment is not normally a blanket application to all resources within a park. It may be specific to individual resources within the park.

Parks need to consider impairment not only for proposed actions that may occur, but also for ongoing management that may result in impairment and the effects of past actions that may already be impairing park resources. Each of these three situations needs to be addressed differently.

Proposed future actions. This is perhaps the easiest situation to address. Proposed actions can be evaluated early in the planning stages to reduce impacts to resources and avoid impairment concerns. The goal of impairment evaluations is to prevent decisions that may impair resources. If impacts are considered early enough in the planning process, resources have not been irretrievably committed and the inertia accompanying most projects does not constrain modifications. Information needed to make an impairment determination may be sparse and speculative.

On-going actions. Current actions are more difficult than future actions to address because decisions have already been made, resources have been committed, and the actions may already have a strong constituency for continuation or to resist modification. Information needed to make an impairment determination may be more abundant and less speculative because actual effects can be observed. The NPS Management Policies address situations where an ongoing activity might have led or be leading to impairment. Park managers must investigate and determine if there is, or will be impairment, preferably as part of a planning process undertaken for this purpose. If impairment is found, appropriate action should be taken, to the extent possible within the Service's authority and available resources, to eliminate the impairment as soon as reasonably possible.

Impairment from past actions. Remediation of past actions that have impaired park resources are very difficult to address. While there may be more information available on the actual effects of the action, the amount of restoration needed to reverse the effects can be very large. Funding required to restore past actions may easily exceed the original costs of the action that caused the impairment. The restoration of past actions presents an additional dilemma; if a project partially restores an area to desired conditions, but does not fully rectify impairment, does the project still impair resources (and thus violate the non-impairment directive)? In almost all cases, the answer is probably "no." However, if the restoration action only partially restores park resources and it precludes future options for full restoration, then it may impair resources.

The following table provides information on the locations of public meetings held in 2002 and 2003. The table is organized by year and then by month. The locations are listed in the following order: 1) locations where the meeting was held in a public building, 2) locations where the meeting was held in a private building, and 3) locations where the meeting was held outdoors. The table also includes the date of the meeting and the time of day.

APPENDIX 5.A

FLYER LOCATIONS ANNOUNCING PUBLIC MEETINGS IN 2002 AND 2003

This appendix provides information on the locations of public meetings held in 2002 and 2003. The information is presented in a table format, organized by year and then by month. The locations are listed in the following order: 1) locations where the meeting was held in a public building, 2) locations where the meeting was held in a private building, and 3) locations where the meeting was held outdoors. The table also includes the date of the meeting and the time of day.

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FLYERS ANNOUNCING PUBLIC MEETINGS IN 2003	
ST. GEORGE, UTAH MEETINGS	
St. George	Public Library; City Offices; BLM Interagency Office; Post Offices; Lin's Market bulletin board; Outdoor Outlet; Motorcycle shops; Lowes and Home Depot; Greenhouses
Ivins	Art Gallery; Post Office; City Offices
Shivwits	Tribal Building
Santa Clara	Post Office; City Offices
Washington	Post Office; City Offices; St. Helen's Restaurant
Hurricane	Lin's Market bulletin board; Chevron; Post Office; Garden Café; Graff Mercantile; Hurst Ace Hardware; Museum
La Verkin	Post Office; Chevron; Sunrise Market; Farmers Market
Virgin	Post Office
Springdale	Post Office; City Offices; Zion NP, and Visitor Center
Toquerville	Post Office
Leeds	Post Office; City Offices
FREDONIA, ARIZONA MEETINGS	
Kanab	Glazier's Groceries; Kanab Texaco; Rocking V Café; Escobars Restaurant; Honey's IGA Store; Willow Creek Books; Kanab Field Office; Grand Staircase-Escalante National Monument Office; City Library; Post Office; Houston's Trails End Restaurant; Vermilion Café
Fredonia	City Offices; Post Office; Forest Service
Outlying Areas	Jacob Lake; Pipe Spring Visitor Center; Kaibab Paiute Tribal -Headquarters
Colorado City	Post Office; Town Hall; Service Stations at Apple Valley and Colorado City
Pipe Spring	Tribal Offices
Moccasin	Court
Page	Post Office; Glen Canyon Visitor's Center; City Offices
BLM Paria Contact Station	
Marble Canyon	
Vermilion Cliffs	
Cliff Dwellers	
MESQUITE, NEVADA MEETINGS	
Beaver Dam	Elementary School; Sheriff's Office; The Dam Market; Post Office
Littlefield	Community College
Mesquite	City Offices; Post office
Bunkerville	Post Office; Courthouse; Community Center

FLYERS ANNOUNCING PUBLIC MEETINGS IN 2002	
ST. GEORGE, UTAH MEETINGS	
St. George	Public Library; City Offices; BLM Interagency Office; Grand Canyon Trust Office; Harmons & Lins Market; Smiths; Albertsons; Post Office; Outdoor Outlet
Ivins	Art Gallery at Kayenta; Post Office; City Office
Shivwits Reservation	Tribal Building
Santa Clara	Post Office; City Offices
Washington	Albertsons; Nissons Foodtown; Nissons Market; Post Office; City Offices
Hurricane	Lin's Market; Chevron; Post Office; Garden Café; Graff Mercantile; Hurst Ace Hardware; Museum
La Verkin	Post Office; Chevron; Sunrise Market; Farmers Market
Virgin	Post Office
Springdale	Post Office; City Office; Zion National Park Visitor Center
Toquerville	Post Office
Leeds	Post Office; City Offices
FREDONIA, ARIZONA MEETINGS	
Kanab	Glazier's Groceries; Kanab Texaco; Rocking V Café; Escobars Restaurant; Honey's IGA Store; Willow Creek Books; Kanab Field Office; Grand Staircase-Escalante National Monument Office; City Library; Post Office; Houston's Trail End Restaurant; Vermilion Café
Fredonia	City Offices; Post Office; Forest Service Office
Outlying Areas	Jacob Lake Café and Gift Shop; Service Station at Pipe Spring; Pipe Spring Visitor Center; Kaibab Paiute Tribal Headquarters
Colorado City	Post Office; Town Hall; Service Stations at Apple Valley; Mohave Community College
Page	Post Office; City Office; Food Stores; Glen Canyon NRA
Big Water	Post Office; City Office
Paria Contact Station (BLM) Marble Canyon	
Vermilion Cliffs & Cliff Dwellers	
MESQUITE, NEVADA MEETINGS	
Beaver Dam	Elementary School; Sheriff's Office; The Dam Market; Post Office
Littlefield	Community College
Mesquite	City Office; Post Office; Smiths
Bunkerville	Post Office; Courthouse; Community Center

As the nation's conservation agency, the Department of Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environment and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

United States
Department of the Interior
Bureau of Land Management
National Park Service
345 East Riverside Drive
St. George, UT 84790

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