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Service

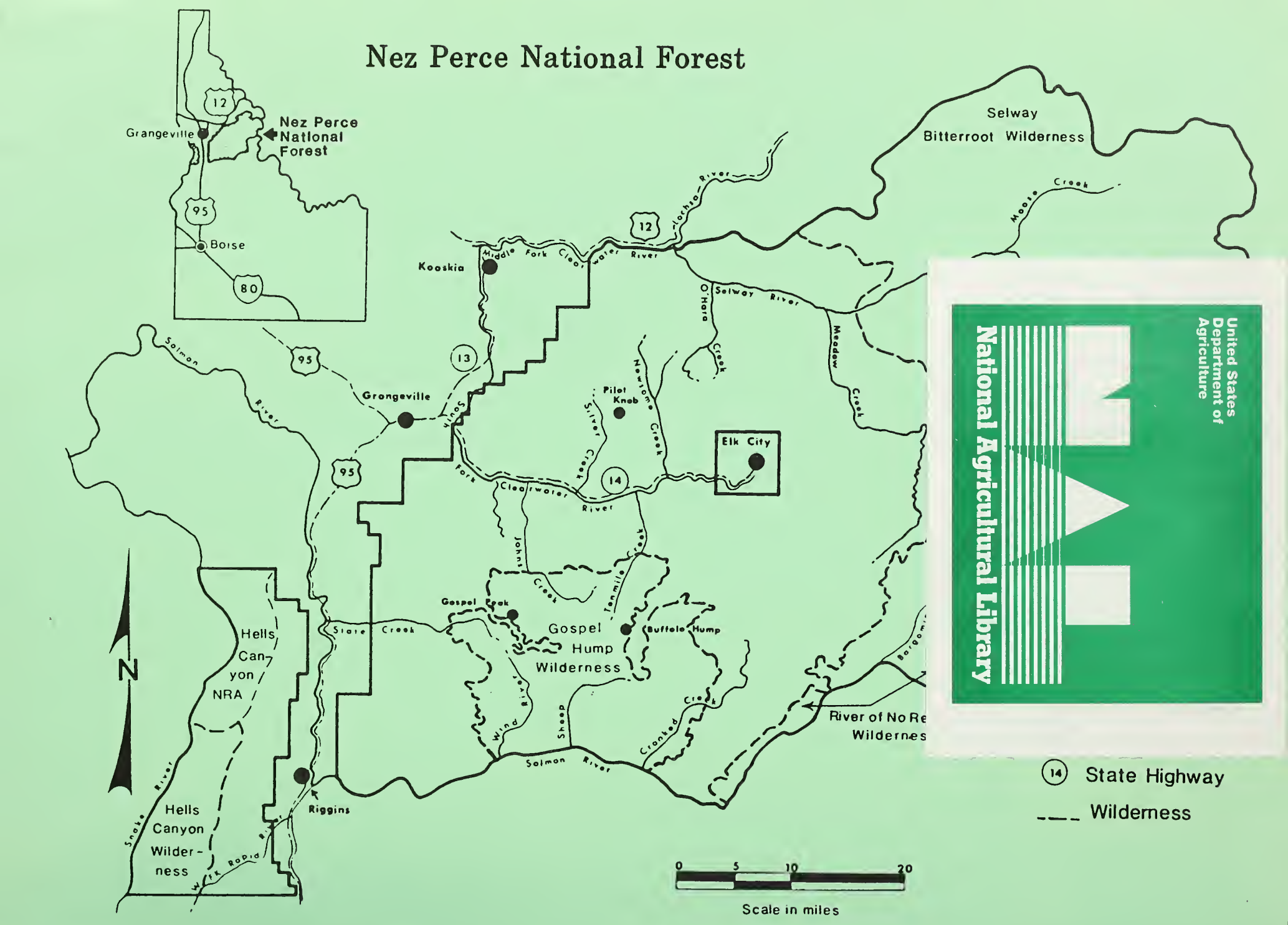
Nez Perce
National Forest

Upper Swiftwater

DRAFT ENVIRONMENTAL IMPACT STATEMENT

JUNE, 1993

Nez Perce National Forest



COVER SHEET

Title of Document: Upper Swiftwater Timber Sale

Type of Statement: Draft Environmental Impact Statement (DEIS)

Proposed Action: Harvest approximately 8.9 MMBF of conifer saw timber and construct about 3.5 miles of road within the Swiftwater drainage on the Selway Ranger District of the Nez Perce National Forest.

Lead Agency: U.S. Department of Agriculture, U.S. Forest Service

Cooperating Agencies: None

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Comments: Reviewers of this document should provide the Forest Service with their comments during the review period. This will enable the Forest service to analyze and respond to the comments at one time and to use information acquired in thr preparation of the final environmntal impact statement, thus avoiding undue delay in the decision making process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 553 {1978}. Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. *City of Angoon v. Hodel* {9th Circuit, 1986} and *Wisconsin Heritages, Inc. v. Harris*, 490 F. Supp. 1334, 1338 {E.D. Wis. 1980}. Comments on the draft should be specific and should address the adequacy of the statement and the merits of the alternative discussed (40 CFR 1503.3).

Abstract: The Selway Ranger District of the Nez Perce National Forest has proposed to harvest approximately 8.9 MMBF of conifer saw timber from 309 acres and construct 3.5 miles of road within the Swiftwater drainage. This DEIS shows alternatives to this proposal and the environmental effects of each. The interdisciplinary team preferred an alternative to the proposed action that would harvest approximately 10.4 MMBF of conifer saw timber over 351 acres and construct 3 miles of road. This alternative would be implemented in the years 1993 through 1997 using conventional (tractor and skyline) and helicopter logging methods. The purpose of implementing this alternative is to silviculturally treat areas of National Forest land that currently have a high incidence of Armellaria root rot and/or would benefit from treatment to meet a desired condition outlined in the Nez Perce Forest Plan. As well, implementation would help meet short-term demands for wood products while allowing for long-term resource management within the Swiftwater drainage.

SUMMARY

I. PURPOSE AND NEED

The purpose of the proposed action is to silviculturally treat areas of timbered land that could benefit from such treatment and also move that area toward the desired condition stated in the Nez Perce Forest Plan. In particular, areas proposed for harvest have a high incidence of root disease (Armellaria). The proposed action would also help satisfy short-term demands for timber and to move toward a balance of timber age classes on suitable lands over the long term while maintaining other resources and an upward trend in the below-objective Swiftwater watershed.

The need for the proposed action is to check the spread of Armellaria root disease which left unchecked could result in epidemic disease conditions as well as result in increased fire hazard. In addition it is the Forest's obligation to achieve the goals, objectives, and standards contained in the Nez Perce Forest Plan. The proposed action is an example of an appropriate activity to meet the Forest Plan Goal: "Provide a sustained yield of resource outputs at a level that will help support the economic structure of local communities and provide for regional and national needs." This need is consistent with the basic mission of the Forest Service, as expressed in the Multiple Use-Sustained Yield Act of 1960 (16 USC 528-531) and the Organic Administration Act (16 USC 475) as well as in the National Forest Management Act (16 USC 1601-1614).

The proposed action begins the move toward the desired condition described in the Forest Plan for the Management Areas identified in the Upper Swiftwater analysis area. Particularly in the timber resource area while developing the appropriate transportation system needed for long term management and resource protection and assuring that the ability to also move toward the desired condition in other resource areas is furthered; or as a minimum not impaired. Specific components of the desired condition are not identified into perpetuity in site specific locations; it is recognized that a dynamic forest ecosystem will progress over time and the areas providing the mixture of elements of the desired condition will not remain static.

Analysis on the Selway Ranger District is limited to areas where resources would not be compromised over the long-term. In particular, fish and water quality help us to determine areas which can/can not be entered or considered for analysis (Forest Plan Appendix A page A-4). The primary area which can not be entered in this planning decade (1987-1997) is the Meadow Creek area which lies adjacent to the Selway-Bitterroot Wilderness approximately 18 air miles to the east of the Swiftwater analysis area. Other areas of the Selway Ranger District have approved NEPA analysis which allows the harvest of timber resources. The remaining area, including Swiftwater drainage, is either currently or planned for NEPA analysis within this planning decade.

II. DECISIONS TO BE MADE

In the Record of Decision for this EIS, the Nez Perce Forest Supervisor will make the following decisions:

* Whether the proposed action, or an alternative to the proposed action, should be implemented at this time. (If implementation of an action alternative is deferred, no other decisions are necessary)

* Location and scheduling of timber harvest and silvicultural treatment.

* Extent of road construction, reconstruction and use of temporary roads and the associated management practices.

* Access management measures (road, trail, and area restrictions and closures):

* Visual quality objectives for the analysis area (Forest Plan Amendment 4, March 30, 1989).

* Concurrence with the interdisciplinary team's validated Management Areas and boundaries.

* Specific mitigation measures to achieve Forest Plan objectives and standards for specified resources to be scheduled and implemented.

* Specific monitoring to be scheduled to assure decision is implemented as planned.

III ALTERNATIVES CONSIDERED

Alternative One- No Action

This is the No Action alternative. Neither the proposed action (alternative two) nor any other action alternative would be implemented at this time under this alternative. The existing land and resource conditions and management would be maintained as described in Chapter Three. Impacts would be the result of natural processes; there would be no short-term progress toward the desired condition in Management Areas which require management to reach such.

The existing visual quality would be maintained, shaped only by the acts of nature. Recreation opportunities would not be impacted. Elk habitat would be changed only by the forces of nature. Opportunities for timber management would be delayed or lost. None of the overmature and high-risk timber in the area would be harvested; timber stand improvement and regeneration activities would not occur. Water quality improvements scheduled would be implemented as planned.

Alternative Two - Proposed Action

Alternative two is the action proposed as a result of the intergrated resource analysis (IRA) required by NFMA. This alternative would initiate timber harvest on approximately 309 acres of elk summer range using only conventional logging methods (tractor and skyline) to give about 8.9 MMBF of conifer saw timber. The road system proposed would be the greatest of any of the alternatives with a total of 3.62 miles which would provide the most access for future resource management. The proposed harvest would treat high-risk timber stands with root disease and those stands which are over-mature. As part of this alternative road #1119, at its junction with road #9723 to its junction with road #1129, would be closed to all motorized vehicled year-round. This proposed road closure would enhnce elk habitat potential in the Goddard elk evaluation area.

Alternative Three

This alternative concentrates timber harvest activities that would be accessible without constructing new roads. Although no new roads are proposed, approximately 1.3 mile of road would be reconstructed and about 0.40 miles of temporary road would be constructed to be obliterat-

ed after use. This alternative would harvest approximately 177 acres of elk summer range using conventional skyline logging systems to yield 4.1 MMBF of conifer saw timber.

Alternative Four

Alternative four proposes for harvest the maximum volume that can be harvested in the Swiftwater drainage at this time while complying with the Nez Perce Forest Plan standards and guidelines. This alternative proposes to harvest approximately 13.1 MMBF of conifer saw timber over 459 acres of which 429 would be elk summer range and 30 elk winter range. This alternative provides the maximum helicopter volume and also uses conventional skyline and tractor methods. This alternative proposes the least amount of road building with a total of 1.72 miles, none of which would be new construction.

Alternative Five

Alternative five is very similar to alternative two in purpose where only conventional logging methods would be used and harvest would be concentrated on elk summer range. The difference in these alternatives is that this alternative would not harvest unit #3 and it provides for different access to units #2, #5, and #6 (see map to right). The major difference is the access to unit #6, where alternative two would reconstruct road #1119D this alternative would newly construct a road parrallel to road #1119D and would remove road #1119D from the permanent transportation system.

This alternative would yield approximately 8.0 MMJBF of conifer saw timber while harvesting 311 acres of elk summer range.

Alternative Six - Preferred Alternative

Alternative six is the Interdisciplinary Team recommended alternative. This alternative proposes to harvest the same units as in alternative five with an additional 80 acres of helicopter logging for a total of 10.4 MMBF of conifer saw timber to be harvested from 351 acres. This alternative would also close road #1119, at its junction with road #9723 to its junction with road #1129, year-long to all motorized vehicles to enhance elk summer range within the Goddard elk evaluation area.

Other Alternatives Eliminated from Detailed Study

Other alternatives were considered but eliminated from detailed study. Those alternatives included management practices that would:

A. Develop the transportation system for the Swiftwater drainage to its fullest extent;

B. Use only uneven-age silvicultural harvest systems;

C. Use only helicopter yarding methods; or

D. Use only minimum standard, temporary roads.

These alternatives were eliminated from detailed study for varying reasons and included unacceptable risk to resources, economics, and/or an alternative did not meet the purpose and need of the proposed action.

IV. AFFECTED ENVIRONMENT

The DEIS contains detailed descriptions of the exisiting environment, listed below are those aspects of the existing environment that were considered very important and guided the developement of the alternatives proposed. The resource areas shown below were identified as issues during the NEPA process.

A. Visual Quality

* Critical viewing locations along the Selway Wild and Scenic River could be affected.

B. Elk Habitat

* Vehicle use of existing and proposed roads accessing the timber sale could reduce big game security during hunting season, increase the vulnerability of bull elk to hunters, and reduce the effectiveness of elk summer range.

* Additional timber harvest on elk winter range at this time could cause a shortfall in long-term sustained winter forage in the analysis area.

C. Soils, Watershed and Fisheries

* Site-specific examinations indicate that the current fishery habitat potential in Swiftwater Creek is below Forest Plan objectives. Measures to ensure a positive, upward trend in fish habitat potential concurrent with timber harvest are necessary to comply with the Forest Plan.

* Road construction and timber harvesting could cause increases in erosion and raise instream sediment levels within Swiftwater Creek.

* Harvesting timber within the riparian zone could degrade fish habitat by decreasing acting/potential woody debris and removing shade.

D. Biological Diversity, Fragmentation and Ecosystem Management

* Management of the analysis area to sustain viable populations of native plants and animals, along with their natural environment and processes, should be analyzed.

* To help insure long-term viability of native species in the analysis area, populations should be large enough to maintain adequate genetic diversity.

* The ecosystem's ability to withstand natural and human-caused disturbances will be enhanced by retaining all components of an ecosystem.

E. Threatened, Endangered and Sensitive Species

* Habitat for threatened or endangered wildlife species may exist within and adjacent to the analysis area.

* Habitat for threatened or endangered fish species may exist in the analysis area or the adjacent Selway River.

* Sensitive plant and animal species are known to exist within and adjacent to the analysis area.

F. Transportation System

* Retention and use of existing and proposed roads should be governed by long-term resource management objectives.

* Construction of low-standard, temporary roads that would be obliterated following use should be considered in the analysis.

G. Social and Economic

* The volume of timber proposed for harvest in the Swiftwater drainage, as it relates to the maximum volume obtainable while still meeting Forest Plan standards, is a concern of wood products companies dependent on National Forest raw materials.

* Timber sale receipts should, at least, equal timber sale costs for commercial timber sales.

* The silvicultural prescription of clear cutting is not liked by many people even when it has been proven to be the optimal silvicultural treatment for a particular stand.

H. Air Quality

* Proposed post-harvest treatments of fuels (burning) could decrease the local air quality within the Clearwater Basin and in the Class I Selway-Bitterroot Wilderness area only 20 air miles to the east.

V. ENVIRONMENTAL EFFECTS

An Environmental Impact Statement implies that there may be significant environmental impacts. This EIS was prepared in response to appeals to the original Environmental Assessment because the proposal had become highly controversial not because the proposed project may have significant environmental effects. The Upper Swiftwater EIS does not display any significant environmental effects for any resource.

The environmental effects displayed below are for the **preferred alternative** only. For additional information on the effects of this alternative and other alternatives the DEIS should be referenced.

A. Visual Quality

No harvest activity would be noticable from the Selway River. All harvest would occur within areas designated with a visual quality objective of modification.

B. Elk Habitat

The preferred alternative would harvest approximately 351 acres of elk summer range creating additional forage areas while maintaining security areas within both Elk Habitat Evaluation Areas (Lodge Point and Goddard). This alternative would result in post harvest summer habitat effectiveness ratings of approximately 54% and 77% respectively which meet Forest Plan objectives.

This alternative does not propose any harvest on winter range and therefore would not have an effect on that range.

C. Soils, Watershed, and Fisheries

1. Soils

Road construction and harvest activities have historically had the most impact on soils. The preferred alternative would construct approximately 3.28 miles of road (combined construction, reconstruction and temporary road mileage) mostly on rolling upland landforms. This alternative would harvest 351 acres, using various harvest and logging systems, where nearly 70% of those acres are on dissected stream breakland landforms. The preferred alternative would produce the second greatest amount of sediment (alternative two has the greatest) and would be within forest plan standards.

All new roads would be constructed to meet an 80% mitigation level for sediment production. All Best Management Practices that are applicable would be applied. Between the EA and this EIS some on-the-ground work occured and harvest units were flagged to protect riparian areas.

2. Watershed

Impacts to the watershed were determined by looking at impacts to riparian areas, water yield and sediment production. All known riparian areas have been identified on-the-ground and have been excluded from all proposed harvest units. Where small riparian areas are located within units, trees would be marked to provide channel stability, shade, and large woody debris.

Water yield has been calculated using an equivelent clearcut acrage formula. The current equivelent clearcut acrage within the Swiftwater drainage is 10%, alternative six aould increase this to 19%. This percentage should not result in an incremental effect on the water yield produced by the Swiftwater drainage and should not have any negative impacts on the stream channel.

The computer model NEZSED was used to predict an estimate of sediment production for each alternative. Currently Swiftwater Creek is 11% over its natural baseline sediment production. Alternative six would increase that to 28% the first year of activity yet would reduce to 11% within five years. This percentage of increase over baseline is within Forest Plan acceptable levels.

3. Fisheries

Swiftwater Creek is identified in the Forest Plan as an 80% fish/water quality objective stream. Current conditions in Swiftwater Creek do not meet this objective where on average it has 65% habitat effectiveness. An upward trend in habitat effectiveness would occur with all alternatives with the implementation of identified watershed improvement projects (DEIS Table 4.7).

Swiftwater Creek, as an 80% fish/water quality objective stream, is allowed under the Nez Perce Forest Plan to have two entries per decade within a sediment yield of 45% over base. The computer model FISHSED is used in combination with NEZSED to predict fish habitat response to proposed activities. Alternative six would result in an approximate habitat loss of 3.5% for both A and B channel types for summer fish, steelhead and winter cutthroat. This loss in habitat is not significant and is nearly the same for all action alternatives. All applicable Best Management Practices would be applied to limit the loss of fish habitat.

D. Biological Diversity, Fragmentation and Ecosystem Management

Vegetative patterns and composition werew chosen to measure the impacts on biodiversity because they are somewhat quantifiable and describable. The existing condition for the Upper Swiftwater areas is constantly changing, vegetation has died and rotted and new plants have begun to grow. All of the action alternatives would, to some extent, change the natural progression of vegetation. These alternatives would create patches were harvest is proposed that are within the natural size variablity but the spacing would be well outside that of naturally occuring openings. Unit edges would not be very "fuzy" and may be located in places that nature would necessarily place them. Over time, a distinct pattern of age classes would become evedent and homogeneous.

Each of the alternatives, including the no action alternative, designated 436 acres of old growth as Management Area 20. These acres would not be harvested under any alternative. The Upper Swiftwater analysis area does contain other stands which have old growth characteristics. The preferred alternative would harvest approximately 77 acres with existing old growth characteristics and 274 acres of which would be considered replacement old growth.

E. Threatened, Endangered and Sensitive Species

1. Wildlife

The preferred alternative would have no effect on any threatened or endangered species suspected to be within the Upper Swiftwater analysis area. Ten sensitive species were identified for analysis, the preferred alternative would maintain these species' populations and not lead them to be listed as threatened or endangered.

2. Fish

The fall chinook was evaluated as a threatened species for this analysis although there is not spawning habitat within Swiftwater Creek. All action alternatives would have some effect on fall chinook but that effect is estimated to not be significant. No determination has been given for the fall chinook. A determination will be given for fall chinook and appropriate National Marine Fisheries Sevice consultation will be conducted prior to the Final EIS.

Sensitive species identified for analysis included Westslope cutthroat trout, steelhead trout, and bull trout. The preferred alternative would not have an adverse impact for any of these species that would impact their habitat or populations leading them to federal listing as threatened or endagered.

3. Plants

No threatened or endangered plant species exist in the analysis area. The preferred alternative would not adversely effect any sensitive species. The designated old growth areas and riparian management would provide suffucient protection for all species.

F. Transportation System

All proposed roads would be restricted to administrative traffic during harvest activities and closed to all motorized use after harvest was complete. The preferred alternative would also close a portion of road #1119 to all motorized year-long. These actions would limit vehicle access to areas but would not adversely effect any activities currently taking place on the District.

The preferred alternative would build approximately 0.77 miles of temporary roads that would be obliterated after use. The environmental effects of building these types of roads are discussed in the Soils, Watershed and Fisheries section. Obliteration of these roads would decrease human access and improve wildlife security in the short and long-term.

G. Social and Economic

The preferred alternative would harvest approximately 271 acres using a clearcut with reserve harvest system. Although visual quaility objectives would be meet and clearcutting would be the optimal treatment for those stands, clearcutting is offensive to many. This alternative may adversely effect those individuals whom find clearcutting offensive.

This alternative has a present net value of approximately 320 thousand dollars with approximately 370 thousand dollars going to the local communities through the 25% Fund over the life of the timber sale.

H. Air Quality

The preferred alternative would use prescribed fire as a tool to reduce fuel loading and prepare sites for planting within the harvest units. This burning would create smoke (particulate matter) that has been estimated to be within the National Ambient Air Quality standards. Established smoke management methods would be implemented to reduce the impact of smoke on local communities.

G. Effects to Other Resources

1. Recreation

All 730 acres of Recreation Opportunity Spectrum classified semi-primitive, non-motorized land would be converted to roaded modified. This alternative would have little effect on other recreation activities in the area.

2. Noise

The preferred alternative proposes to harvest approximately 80 acres (2.5 MMBF) using helipcopter logging systems. Noise would be concentrated in the area of activity and would not likely be heard in the river corridor. The amount of helicopter volume proposed could easily be removed in one season with little effect on Forest visitors.

3. Cultural Resources

Cultural sites exist within the Upper Swiftwater analysis area; all alternatives avoid known sites however, there is always a potential for discovery of new sites when ground distrurbing activities are proposed. If additional sites are found during project implementation, mitigation would be applied so as to not affect cultural resources.

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Chapter One

Purpose Of and Need For Action

CHAPTER ONE

PURPOSE OF AND NEED FOR ACTION

I. INTRODUCTION

This draft Environmental Impact Statement (EIS) discloses the direct, indirect, and cumulative environmental effects of a proposed action and alternative actions for timber harvest, road construction, road reconstruction, road obliteration, reforestation, and related mitigation to be implemented within the Upper Swiftwater drainage on the Selway Ranger District, Nez Perce National Forest, Idaho County, Idaho. The proposal would implement the Forest Plan by scheduling management practices on management areas in accordance with Forest-wide and management area standards in order to move toward a desired forest condition.

Development of this EIS is based on direction contained in the National Forest Management Act (NFMA) and its implementing regulations at 36 CFR 219; the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations at 40 CFR 1500-1508; the National Historic Preservation Act and its accompanying regulations at 36 CFR 800; the Wild and Scenic Rivers Act, P.L. 90-542 (82 Stat. 906) and the *River Plan of the Clearwater (including the Lochsa and Selway)*, implementing the law; the Federal Water Pollution Control Act (Clean Water Act) together with regulations at 40 CFR 130; and the Clean Air Act. Also the Endangered Species Act and 50 CFR 402.12.

Public and Federal, State, and local agency comments on the draft EIS will be accepted following publication of a Notice of Availability in the *Federal Register*. These comments will be assessed and considered both individually and collectively, and a final EIS will be prepared which responds to them. Finally, the Nez Perce Forest Supervisor will select an alternative to be implemented, and this decision will be documented in a Record of Decision.

A. Location

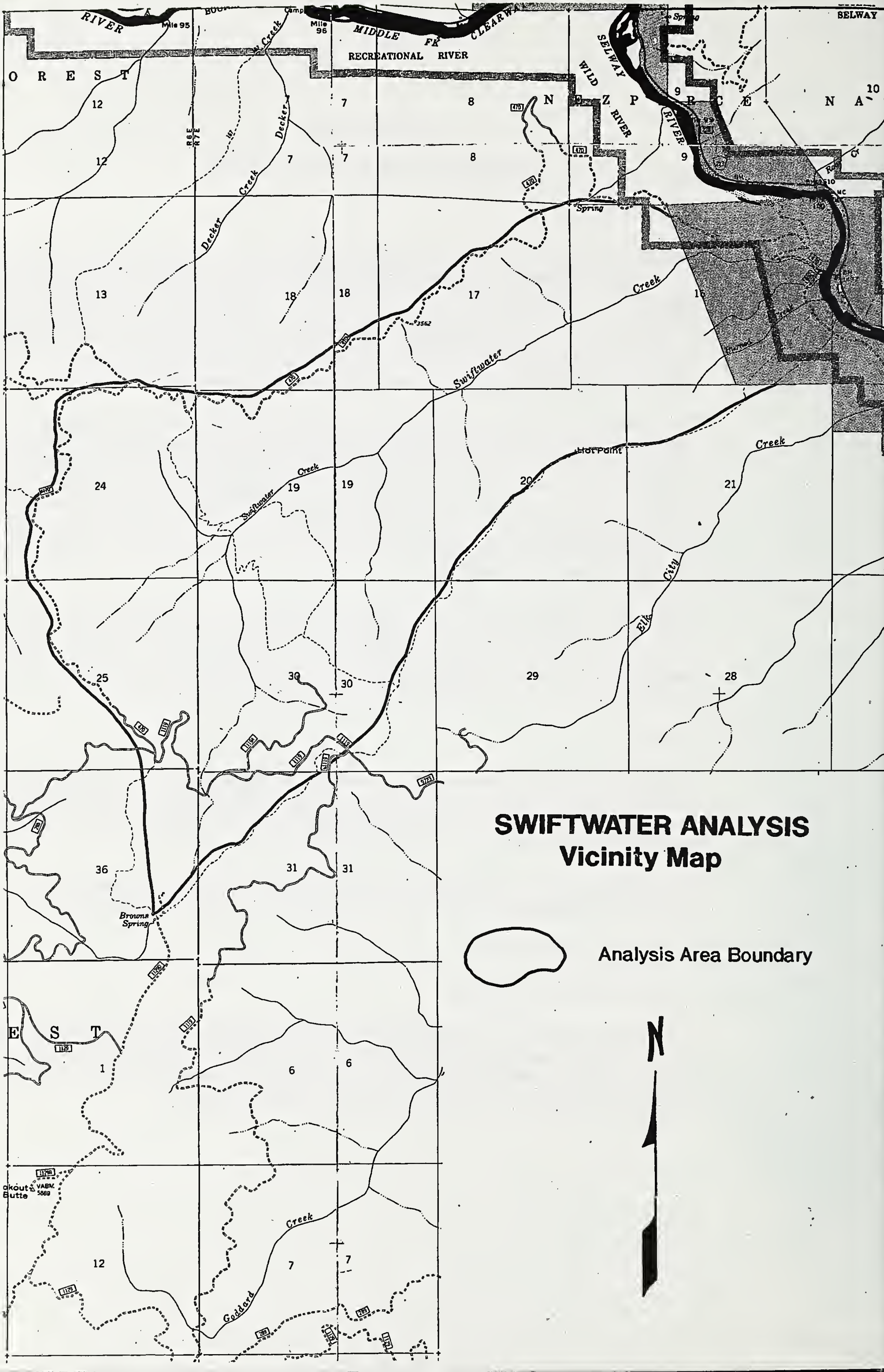
The Upper Swiftwater analysis area is approximately 4000 acres in size and lies about 30 air miles northeast of Grangeville, Idaho, and is located entirely within the Swiftwater Creek and Burned Creek drainages, both of which are tributaries to the Selway River. An additional 236 acres of private land are located in these drainages. (Figure 1.1)

Key resource values include big game summer and winter range; anadromous fisheries; timber sites with a full range of productivity; and proximity to the Selway recreational river.

II. THE PROPOSED ACTION

A. Integrated Resource Analysis

Forest Plan implementation means moving from an existing forest condition toward a desired condition. The existing condition of the Swiftwater analysis area is described in Chapter Three of this EIS. The proposed action and alternative actions considered in Chapter Two of this EIS are possible approaches toward achieving the desired condition.



SWIFTWATER ANALYSIS
Vicinity Map

The desired condition is the projected result of applying Forestwide and management area goals, standards, and management practices to specific management areas over several decades. It is to be reached through integrated management and is responsive to site-specific, on-the-ground conditions.

An Integrated Resource Analysis (IRA) was undertaken to explore opportunities to move toward the desired condition within the Upper Swiftwater analysis area. Once the desired condition was defined, the existing condition of the analysis area was assessed, utilizing an interdisciplinary team of resource specialists. The detailed diagnosis of treatment needs identified on the analysis area can be found in the planning record associated with this analysis.

The purpose of the integrated resource analysis was to identify resource management opportunities that would contribute to meeting the desired condition. If changes in management are needed to move toward the desired condition, opportunities were explored. Feasibility and consistency with Forest Plan direction were reviewed and evaluated as part of the analysis.

The product of the IRA was a site-specific proposed action designed to lead toward the desired condition. The specifics of the proposal included the location of proposed activities and the schedule in which these activities would occur. These management practices complied with the management area and Forest-wide standards and appropriate Forest Plan amendments.

A description of the desired conditions for each of the Management Areas within the Upper Swiftwater analysis area is located in Appendix A.

B. Proposed Action

The Nez Perce National Forest proposes to harvest approximately 8.9 million board feet (MMBF) from approximately 309 acres in the Swiftwater drainage. Approximately 1.4 miles of new road would be constructed, approximately 0.8 miles of existing road would be reconstructed, and approximately 1.7 miles of temporary road would be constructed to low standards and obliterated after use. All acres harvested would be prescribed burned to prepare for reforestation.

The purpose of the proposed action is to silviculturally treat areas of timbered land that could benefit from such treatment. In particular, areas proposed for harvest have a high incidence of root disease (Armellaria). The proposed action would also help satisfy short-term demands for timber and to move toward a balance of timber age classes on suitable lands over the long term. In conjunction with the proposed timber harvest an upward trend in the condition of Swiftwater Creek will be maintained; all other resource values will be maintained, at a minimum, to the standards prescribed by the Nez Perce Forest Plan.

The need for the proposed action is to check the spread of Armellaria root disease which left unchecked could result in epidemic disease conditions as well as result in increased fire hazard. In addition it is the Forest's obligation to achieve the goals, objectives, and standards contained in the Nez Perce Forest Plan. The proposed action is an example of an appropriate activity to meet the Forest Plan Goal: "Provide a sustained yield of resource outputs at a level that will help support the economic structure of local communities and provide for regional and national needs." This need is consistent with the basic mission of the Forest Service, as expressed in the Multiple Use-Sustained Yield Act of 1960 (16 USC 528-531) and the Organic Administration Act (16 USC 475) as well as in the National Forest Management Act (16 USC 1601-1614).

The proposed action begins the move toward the desired condition described in the Forest Plan for the Management Areas identified in the Upper Swiftwater analysis area. Particularly in the timber resource area while developing the appropriate transportation system needed for long

term management and resource protection and assuring that the ability to also move toward the desired condition in other resource areas is furthered; or as a minimum not impaired. Specific components of the desired condition are not identified into perpetuity in site specific locations; it is recognized that a dynamic forest ecosystem will progress over time and the areas providing the mixture of elements of the desired condition will not remain static.

Analysis on the Selway Ranger District is limited to areas where resources would not be compromised over the long-term. In particular, fish and water quality help us to determine areas which can or can not be considered for analysis (Forest Plan Appendix A page A-4). The primary area which can not be entered in this planning decade (1987-1997) is the Meadow Creek area which lies adjacent to the Selway-Bitterroot Wilderness approximately 18 air miles to the east of the Swiftwater analysis area. Other areas of the Selway Ranger District have approved NEPA analysis which allows the harvest of timber resources. The remaining area, including Swiftwater drainage, is either currently or planned for NEPA analysis within this planning decade.

III. NATIONAL FOREST DECISION MAKING

National Forest planning involves two levels of decisions. The first level is approval of a Forest Plan that provides general direction for all resource management programs, practices, uses, and protection measures on the Forest. The second level involves the analysis and documentation of site-specific management practices designed to achieve the goals, objectives, and standards set out in the Forest Plan.

A. Forest Plan Decisions

The Nez Perce National Forest Plan was approved by the Regional Forester in October 1987. It made the following Forest-wide decisions. These decisions are not being reconsidered in this EIS:

* Goals and objectives of forest management, including a description of the desired condition of the forest [36 CFR 219.11(b)];

* Management standards and proposed and probable management practices for management areas [36 CFR 219.11(c)];

* Lands suitable for timber production [36 CFR 219.14];

* The allowable sale quantity for timber in the planning period [36 CFR 219.16];

* Monitoring and evaluation requirements [36 CFR 219.11(d)].

* Recommendations to Congress for wilderness classification.

B. Project-Level Decisions

In the Record of Decision for this EIS, the Nez Perce Forest Supervisor will make the following decisions:

* Whether the proposed action, or an alternative to the proposed action, should be implemented at this time. (If implementation of an action alternative is deferred, no other decisions are necessary):

* Location and scheduling of timber harvest and silvicultural treatment.

* Extent of road construction, reconstruction and use of temporary roads and the associated management practices.

* Access management measures (road, trail, and area restrictions and closures):

* Visual quality objectives for the analysis area (Forest Plan Amendment 4, March 30, 1989).

* Concurrence with the interdisciplinary team's verified Management Area boundaries.

* Specific mitigation measures to achieve Forest Plan objectives and standards for specified resources to be scheduled and implemented.

C. Tiering and Incorporation by Reference

The Nez Perce National Forest Plan, EIS, and Record of Decision provide direction for management of the Forest and general discussions of associated environmental impacts. In order to eliminate repetition and focus upon site-specific analysis, this EIS tiers to the Forest Plan EIS and Record of Decision as permitted by 40 CFR 1502.20. The Forest Plan is incorporated by reference as permitted by 40 CFR 1502.21.

IV. FOREST PLAN MANAGEMENT AREAS

The Nez Perce Forest Plan sets out 26 Forestwide management areas (MAs). Eight of these MAs are represented within the Swiftwater analysis area. Shown below are the Management Areas found within the Upper Swiftwater analysis area with their corresponding management emphasis and goals. Additional information on Forest Plan management areas can be found in Appendix A of this EIS as well as all of Chapter 3 and Appendix D of the Nez Perce Forest Plan.

TABLE 1.1- DESCRIPTION OF FOREST PLAN MANAGEMENT AREAS

MA	Management Area Emphasis	Management Goals
1	Minimum Level	Provide the minimum management necessary to provide for resource protection and to ensure public safety.
8	Wild & Scenic River	Protect and enhance aesthetic, scenic, historic, fish, wildlife, and other values that will contribute to public use and enjoyment of the free-flowing river and its immediate environment.
10	Riparian	Maintain and enhance riparian area resource values. Timber management is permitted to the extent that it protects or enhances riparian-dependent resources (e.g. water quality, plant and animal species diversity, and fish habitat)

TABLE 1.1- DESCRIPTION OF FOREST PLAN MANAGEMENT AREAS (continued)

MA	Management Area Emphasis	Management Goals
12	Timber	Manage for timber production and other multiple uses. Develop distribution of age classes to optimize sustained timber yield.
16	Elk Winter Range	Improve or maintain a distribution of forage and thermal cover. Non-forest grasslands and seral brush fields are unsuitable for timber management; other lands are suitable.
17	Visual Quality	Manage for sustained timber production while meeting visual quality objectives (VQOs) of "retention" and "partial retention". Vegetative manipulation (elk winter range improvement and timber harvest) are permitted to the extent these activities provide for achieving VQOs.
18	Elk or Deer Winter Range and Commercial Timber	Manage to improve the quality of winter range for elk and deer through timber harvesting or prescribed burning. This is a composite of lands similar to those found in MAs 16 and 17.
20	Old Growth Forest	Provide old growth coniferous forest. Timber harvest can be scheduled, but not during this decade.

A key part of Forest Plan implementation is the verification of Management Area boundaries and acreages. Page III-1 of the Forest Plan states that "The [MA] boundaries are *flexible* to assure that the values identified are protected and to incorporate additional information gained from further *on-the-ground reconnaissance and project level planning*." (emphasis added). As allowed under the Forest Plan the interdisciplinary team (IDT) verified the Management Areas within the Upper Swiftwater analysis area. Table 1.2 shows the Forest Plan allocated management acres and the IDT verified management acres. Figures 1.2 and 1.3, on the following pages, show the physical differences of the validation process.

TABLE 1.2- COMPARISON OF FOREST PLAN AND SITE SPECIFIC MANAGEMENT AREA ACRES

MANAGE-MENT AREA	FOREST PLAN ACRES	% OF TOTAL	SITE SPECIFIC ACRES	% OF TOTAL
1	0	0	16	<1
8*	17	<1	17	<1
10	326	8	407	10
12	1094	28	2217	54
16	964	25	797	20
17	753	19	182	5
18	728	19	0	0
20	0	0	436	11
TOTALS*	3882	100%	4072	100%

* Excludes non-National Forest lands

The process used to map management areas is described on pp. 1-4, Chapter III of the Forest Plan. Further information can be found in Appendix D to the Plan. The Plan specifies (Appendix N, p. 2) that 10 percent of the forested acres in each prescription watershed be retained as old growth and replacement old growth, and that old growth stands be verified as part of project planning. VQOs are also adjusted at the project level (Forest Plan Amendment No. 4), and the Plan recognizes (Chapter III, p. 30) that "as additional acres of riparian areas are identified and mapped during project planning, the acres in this management area [MA 10] will increase." In addition, with the cooperation of the Idaho Department of Fish and Game, MA 16 (deer-elk winter range) in the Swiftwater analysis area was better fitted to site-specific conditions on the ground. MA 18 is a Forest Plan composite MA which was disaggregated into its parent MAs for purposes of this analysis. As a consequence of these adjustments, management area acreages and boundaries in the Swiftwater analysis area differ from Forest Plan acreages and boundaries. However, much of this is a predictable consequence of Plan implementation. The analysis supporting these management area adjustments is contained in the project file.

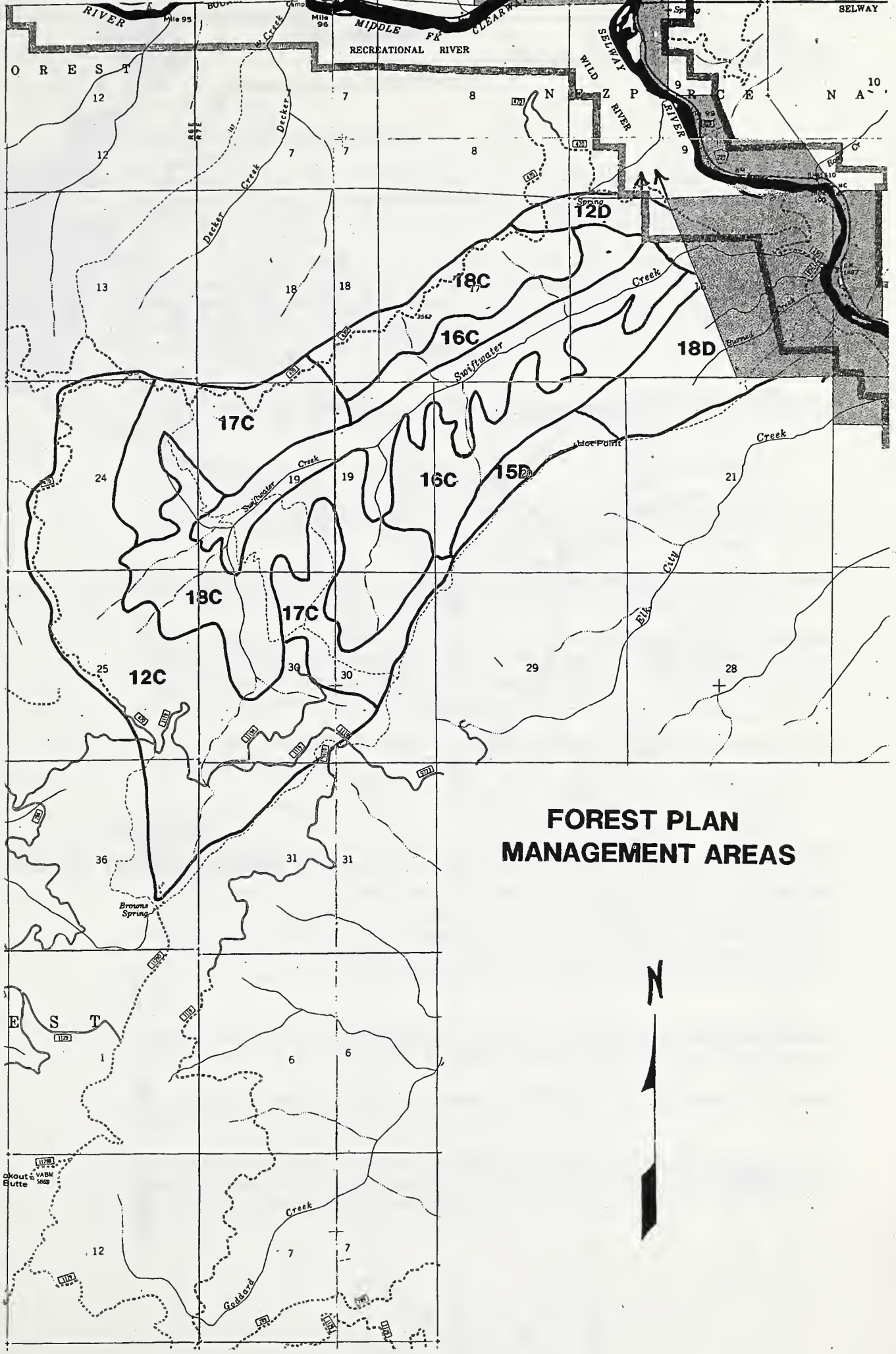
NFMA regulations at 36 CFR 219.27(c)(1), specify that no timber harvest shall occur on lands not suited for timber production. Unsuitability occurs, according to the definition at 36 CFR 219.14, when:

* the land is not forest land; that is, land at least 10% occupied by forest trees of any size or formerly having had such tree cover and not currently developed for nonforest use;

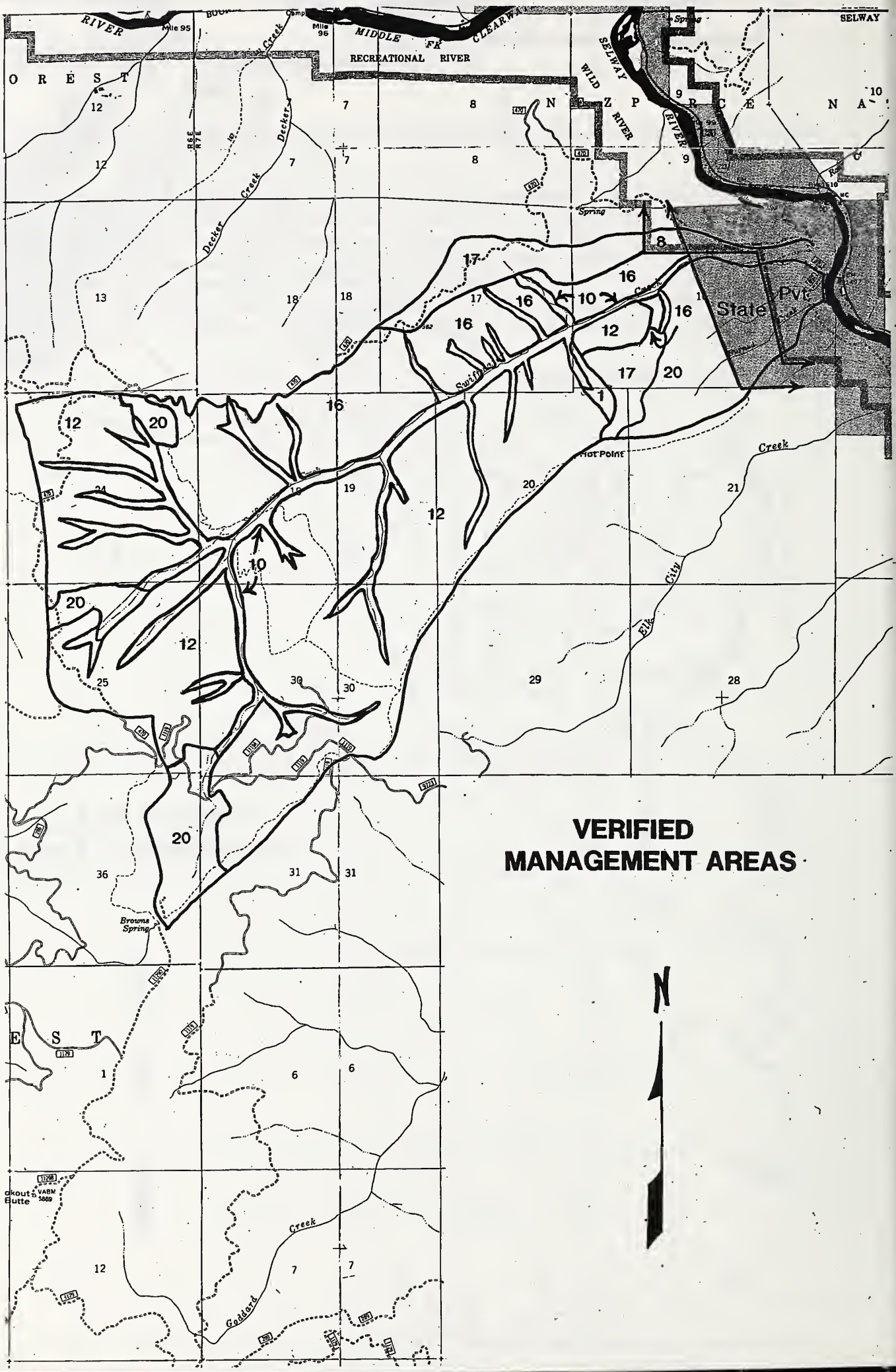
* technology is not available to ensure timber production without irreversible resource damage to soil productivity or watershed conditions, or;

* there is not reasonable assurance that such lands can be adequately restocked within five years after final harvest.

During the Integrated Resource analysis the ID Team determined that there are 16 acres within the Swiftwater area which are either not forest land or there is not a reasonable assurance that these lands can be adequately restocked; this area has been assigned to MA 1 and is classified as "unsuitable". An additional 17 acres of National Forest land is within the legally defined Wild and Scenic River corridor and, according to the Forest Plan (p. III-20) are classified as "unsuitable" for timber production. All other lands in the Swiftwater assessment area have been determined to be tentatively suitable for timber production as defined by NFMA.



FOREST PLAN MANAGEMENT AREAS


RIVER
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WILD
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Elk
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12
20
10
16
17
VERIFIED
MANAGEMENT AREAS
N

V. SCOPING AND PUBLIC PARTICIPATION

The NEPA scoping process (40 CFR 1501.7) was used to determine the scope of the issues to be addressed and to identify the significant issues related to the proposed action. The scoping process was also used to invite public participation and collect initial comments.

Preliminary scoping was completed in 1990. A Record of Decision was signed on an Environmental Assessment (EA) on December 11, 1991. This decision was appealed under 36 CFR Part 217 and was reversed by the Regional Forester on May 8, 1992. Since the environmental effects of the project were clearly controversial and could become highly controversial, a Notice of Intent to prepare an EIS signed by Forest Supervisor Michael King was published in the Federal Register on September 16, 1992.

This section summarizes interdisciplinary actions and public participation prior to completion of the draft EIS:

* An interdisciplinary (ID) team was formed.

* The ID team reviewed the Nez Perce Forest Plan, Final Environmental Impact Statement, and Record of Decision.

* Possible management issues, opportunities, and concerns were identified by the ID team and other concerned resource specialists within the Forest Service.

* Public participation was solicited by sending an informational letter to key contacts requesting comments on January 29, 1990. A news release on the impending analysis was also published at this time and direct discussions were held with individuals interested in the management of the Swiftwater area.

* The Nez Perce Tribe and other State and Federal government agencies with anticipated concerns were contacted.

* The ID team identified the issues relevant to the assessment.

* Public participation was solicited a second time on March 19, 1991. An open house was held at the District office on April 12, 1991. Invitations were mailed to those who had expressed interest through past comments on the Swiftwater area. Invitations were also mailed to key local residents along the Selway River, the immediate area of possible influence of the proposal. The proposed action and alternatives to the proposed action were presented and discussed; comments were taken and filed in the project file. A packet of this same material was mailed when requested by those unable to attend in person.

* Additional meetings with representatives from the Idaho Department of Fish and Game and the Nez Perce Tribe were held by District specialists and members of the ID team.

* An EA was completed and a Decision Notice and Finding of No Significant Impact were signed by the Forest Supervisor on December 11, 1991.

* The decision was appealed to the Regional Forester within the required 45 days by the National Wildlife Federation (Missoula), the Ecology Center (Missoula), and the Inland Empire Public Lands Council (Spokane).

* The decision was reversed by the Regional Forester on May 8, 1992.

* On May 19, 1992, Fisheries Biologists Neil Anderson and Forest Fisheries Biologist Scott Russell met with Columbia River Intertribal Fish Commission (CRITFC) representatives Jon Rhodes, hydrologist, and Jim Weber, attorney to review the riparian protection applied to the harvest unit design. CRITFC approved.

* A Notice of Intent (NOI) to prepare an EIS was published in the *Federal Register* on September 16, 1992.

* A letter and a copy of the NOI was mailed to individuals who had previously expressed interest in the project on Oct. 19, 1992.

* Additional interdisciplinary team meetings were held to evaluate the comments received on the NOI and to determine if additional issues and alternatives would be required in the EIS.

* A complete list of individuals and agencies to whom this draft EIS has been sent is included in Chapter 6.

VI. ENVIRONMENTAL ISSUES

Assessment of comments from the public and other agencies guided the interdisciplinary team in identifying the environmental issues related to the Swiftwater project. A complete history of the scoping and public involvement is contained in the project file. The issues identified by the IDT with guidance from public comments are as follows:

A. Visual Quality

* Critical viewing locations along the Selway Wild and Scenic River could be affected.

B. Elk Habitat

* Vehicle use of existing and proposed roads accessing the timber sale could reduce big game security during hunting season, increase the vulnerability of bull elk to hunters, and reduce the effectiveness of elk summer range.

* Additional timber harvest on elk winter range at this time could cause a shortfall in long-term sustained winter forage in the analysis area.

C. Soils, Watershed and Fisheries

* Site-specific examinations indicate that the current fishery habitat potential in Swiftwater Creek is below Forest Plan objectives. Measures to ensure a positive, upward trend in fish habitat potential concurrent with timber harvest are necessary to comply with the Forest Plan.

* Road construction and timber harvesting could cause increases in erosion and raise instream sediment levels within Swiftwater Creek.

* Harvesting timber within riparian zones (as allowed in the Forest Plan) could degrade fish habitat by decreasing woody debris and removing shade.

D. Biological Diversity, Fragmentation and Ecosystem Management

* Management of the analysis area to sustain viable populations of native plants and animals, along with their natural environment and processes, should be analyzed.

* To help insure long-term viability of native species in the analysis area, populations should be large enough to maintain adequate genetic diversity.

* The ecosystem's ability to withstand natural and human-caused disturbances will be enhanced by retaining all components of an ecosystem.

E. Threatened, Endangered and Sensitive Species

* Habitat for threatened or endangered wildlife species may exist within and adjacent to the analysis area.

* Habitat for threatened or endangered fish species may exist in the analysis area or the adjacent Selway River.

* Sensitive plant and animal species are known to exist within and adjacent to the analysis area.

F. Transportation System

* Retention and use of existing and proposed roads should be governed by long-term resource management objectives.

* Construction of low-standard, temporary roads that would be obliterated following use should be considered in the analysis.

G. Social and Economic

* The volume of timber proposed for harvest in the Swiftwater drainage, as it relates to the maximum volume obtainable while still meeting Forest Plan standards, is a concern of wood products companies dependent on National Forest raw materials.

* Timber sale receipts should, at least, equal timber sale costs for commercial timber sales.

* The silvicultural prescription of clear cutting is not liked by many people even when it has been proven to be the optimal silvicultural treatment for particular stands.

H. Air Quality

* Proposed post-harvest treatments of fuels (burning) could decrease the local air quality within the Clearwater Basin and in the Class I Selway-Bitterroot Wilderness area only 20 air miles to the east.

VII. AVAILABILITY OF PROJECT FILES

The Nez Perce Forest Plan and EIS are incorporated into this Draft Upper Swiftwater EIS by reference. These documents are available for review at the Supervisor's Office in Grangeville and at each ranger station. The Forest Plan is also available at most public libraries in North Central Idaho.

The objective of this EIS is to provide enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives, and how these impacts can be mitigated. It does not contain all of the detailed information which lead to the information displayed in this document. Additional information is contained in the project file located at the Selway Ranger District, Fenn Ranger Station, and are available for public inspection (in compliance with 40 CFR 1500.4).

Chapter Two

Alternatives, Including the Proposed Action

CHAPTER TWO

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

I. INTRODUCTION

Section 102(e) of NEPA states that all Federal agencies shall "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." In addition to responding to unresolved conflicts, an EIS must "rigorously explore and objectively evaluate all reasonable alternatives." [40 CFR 1502.14(a)]. As interpreted by the courts, the range of alternatives can be a range of outputs or allocations. It can also be a range of differences in management emphasis, costs, and public acceptance with essentially the same outputs or allocations.

The alternatives in this EIS reflect a range of road mileages, harvest areas, prescriptions, acreages, yarding systems, and differences in management emphasis.

Although NEPA emphasizes analysis of a proposed action and alternatives to it, both the National Forest Management Act and the Multiple Use-Sustained Yield Act stress integrated resource management. In addition, the Forest Service Region One approach to Forest Plan implementation (*Our Approach*, USDA, 1988) is based on movement toward a desired condition, which is the overall integrated long-term management goal. Thus, while this EIS deals with a specific action, alternatives to it, and associated environmental impacts, the treatment is done in the larger context of integrated forest management over the long term.

National Forest management must be consistent with Forest Plans prepared under authority of the National Forest Management Act [36 CFR 219.10(e)], but since a Forest Plan can be amended [36 CFR 219.10(f)], alternatives may be considered which are not consistent with it. However, if such an alternative becomes the selected alternative, a Plan amendment must be made before the alternative is implemented. This document does not propose any alternative that would require a Forest Plan amendment.

Changes in Forest Plan direction are not proposed in this EIS. All alternatives are consistent with existing Forest Plan direction.

II. ALTERNATIVES

A. Features Common to All Alternatives

1. Access Management

The issue of big game security is closely related to road obliteration and restrictions on the use of roads that are retained for future use. The Forest Plan Record of Decision states on page 30 that "If we cannot justify leaving a road open, it will be closed or restricted." In the Swiftwater analysis area, the ID team found that all new roads would have to be restricted yearlong in all alternatives. Limited traffic related to resource management would be allowed after final harvest. Examples would be reforestation, fish and wildlife habitat improvement, maintenance of road drainage structures, and fire suppression. All other roads within the analysis area will retain their current access prescription unless otherwise stated in the alternative description.

2. Fish/Water Quality

Forest Plan Standards for soils, watershed function and fisheries will be implemented under all alternatives. Water temperature, streamside and instream cover, composition and productivity of the riparian areas will be maintained. Rehabilitation of degraded riparian areas caused by past management activities are ongoing, and will be completed. Beneficial uses identified for the Swiftwater watershed will be protected. State of Idaho Best Management Practices will be exceeded under all alternatives (Appendix B lists BMPs common to all alternatives). There will be no riparian harvest under any of the alternatives. Unit boundaries and road locations are proposed that avoid these areas. All alternatives allow for the meeting of established fishery/ water quality objectives as displayed in Appendix A of the Forest Plan.

Identified and planned watershed improvement projects would occur under all alternatives including the no action. These projects are displayed in Chapter 4, Table 4.7. Additional information can be found in the Fisheries section of Chpaters 3 and 4 of this document.

3. Transportation

Within the Upper Swiftwater area there is limited opportunity for varied road locations. For that reason there is only one location proposed for each of the proposed roads. The alternatives display differences in the extent of total road construction while the location of those roads remains constant.

4. Silvicultural Treatments

Treatment needs that are based on comparing the existing conditions to the desired conditions are common to all alternatives. The desired conditions by Management Area are described in detail in Appendix A. The existing conditions of the forested environment are compared to those desired conditions and treatment needs are assessed in the Silvicultural Diagnosis process. This process is documented and filed in the project file for Upper Swiftwater. A summary of this process and treatment needs is displayed in the table on the next page.

TABLE 2.1- SITE SPECIFIC DIAGNOSIS OF SILVICULTURAL TREATMENT

		REGENERATION HARVEST TYPES (EVEN-AGE)			
UNIT NUMBER	**DIAGNOSIS: EXISTING CONDITION COMPARED TO GOALS AND OBJECTIVES**	**CLEARCUT**	**SEED TREE**	**SHELTERWOOD**	**UNEVEN-AGE MANAGEMENT**
1	Stand is too old to naturally recover to a Desired Condition. Defer treatment is not desireable due to high mortality and rot in the cedar and grand fir.	**Yes, w/reserves Change species to WP,L,LP,S.**	No, lack of desireable seed trees	No, same as Seed	No, long term budworm potential, reduction in Elk security , high sediment from cyclic road use.
2	Stands are becoming understocked due to root rot mortality. Species change desireable to break the root rot cycle. Could periodically salvage dead and dying.	**Yes, w/reserves for anaga and vertical diversity. Change species composition to WP, L, LP, and PP.**	No, lack of sufficient seed trees.	No, lack of sufficient seed trees.	No, long-term root rot problems and species incompatible.
3	Stands are becoming understocked due to root rot mortality. Species change desireable to break the root rot cycle. Could periodically salvage dead and dying.	**Yes, w/reserves for anaga and vertical diversity. Change species composition to WP, L, LP, and PP.**	No, lack of sufficient seed trees.	No, lack of sufficient seed trees.	No, long-term root rot problems and species incompatible.
4	Same as Units 2 & 3	**Yes, same as 2 and 3 above.**	No, root rot has wekened leave trees.	No, insufficient leave trees.	No, same as 2 and 3 above.
5	Same as Units 2 & 3	**Yes, same as 2 and 3 above.**	No, root rot has weakened leave trees.	No, insufficient leave trees.	No, same as 2 and 3 above.
6	Same as Units 2 & 3. Could defer for 5 to 7 years or when root rot mortality becomes excessive	Yes, same as 2 and 3 above.	**Yes, w/long-tarm reserves for snag and vertical diversity. interplant w/ WP and LP.**	Yes, but does not require that type of protection.	No, same as 2 and 3 above.
7	Root rot mortality becoming prevalent. Could periodically salvage mortality for 10 to 20 years, then regenerate to change species.	Yes, w/reserves will impact upland riparian areas.	No, seed trees will windthrow at reduced crown closure.	**Yes, w/reserves. Significant riparian areas throughout to be protected.**	The species mix will allow but high budworm potential. Reduction in elk security and high sediment from cyclic road use.
8	Same as Units 2 & 3	**Yes, same as 2 and 3 above.**	No, same as unit 4 above.	No, same as unit 4 above.	No, same as 2 and 3 above.
9	Same as Units 2 & 3	Yes, same as 2 and 3 above.	**Yes, w/long-term reserves for snag and vertical diversity. interplant w/WP, L, and PP.**	No, insufficient leave trees w/out root rot.	No, same as 2 and 3 above.
10	Same as Unit 7. Optional to commercial thin and hold for 20 to 30 years before regeneration harvest. Doubtful whether the trees on site would respond to thinning enough to outpace rot mortality.	**Yes, w/reserves for riparian resource management. Change species composition to L, PP, WP, S.**	No, same as 7 above.	No, lacks sufficient leave trees.	No, same as 2 and 3 above.
11	Same as Units 2 & 3	**Yes, same as 2 and 3 above.**	No, same as unit 4 above.	No, same as unit 4 above.	No, same as 2 and 3 above.
12	Same as Units 2 & 3. This is the only unit in MA 16	Yes, same as 2 and 3 above.	**Yes, same as unit 9 above.**	No, insufficient leave trees without root rot.	No, same as 2 and 3 above.
14	Same as Units 2 & 3	**Yes, same as 2 and 3 above.**	No, same as unit 4 above.	No, same as unit 4 above. No, same as unit 2 and 3 above.	

Highlighted text indiciates optimal silvicultural treatment or choice. All units except #12 are in Management Area 12.

When regeneration of the existing stand is needed, an analysis of potential leave trees is conducted. Leave trees are utilized to provide seed in the case of a seed tree harvest. They also provide shelter for seedlings, and in some cases, riparian or other sensitive vegetation in a shelterwood harvest. Shelterwood harvest is also used where necessary to soften the visual impact of logging. In the absence of suitable seed or shelter trees, clearcutting is considered for meeting the objectives of regenerating the stand. Varied numbers of leave trees called "Reserves" will be left within clearcuts to meet social, as well as biological diversity goals.

Clearcutting is proposed on the analysis area for four interconnected reasons:

1. Root rot mortality is high and/or is increasing. Rehabilitation is required to meet the goals and objectives for Management Area 12.

2. A change to conifer species that are less susceptible to root rot and other pathogens will allow full stocking of trees and minimize the recurrence of these infestations.

3. Full sunlight is required to propogate the conifer, shrub and herbaceous species that are important in meeting long-term goals for wood and forage production.

4. Openings that regenerate to invader and early seral species are important to sustaining the processes and characteristics of this ecosystem.

Clearcuts will be regenerated by planting new trees. Some shelterwood and seed tree harvest units will be planted for species diversity that cannot be accomplished by the available seed trees. Natural regeneration will be utilized as a portion of the stocking in all of the proposed units, where it provides acceptable seedlings. Precommercial thinning will be used to regulate the stocking on regenerated units for optimum growth, forage and wildlife cover.

5. Old Growth Coniferous Forest

The NFMA process validated 223 acres of existing old growth and 213 acres of replacement old growth for a total of 436 acres within Management Area 20. These areas would be managed as defined in the Forest Plan. For all alternatives the location of these stands is constant and no alternative proposes harvest within these designated areas. Chapter Three of this EIS has more information on old growth management areas.

6. Recreation

All action alternatives propose to close the Hot Point trail (#706) year-round to all motorized vehicles.

Use of identified dispersed recreation sites as landings, truck turnouts, or temporary road locations will be avoided. When existing or potential dispersed recreation sites must be affected by sale activities, sites shall be reconstructed or enhanced through available KV collections. Prior to road reconstruction, existing and potential dispersed recreation sites would be identified and incorporated into the project design.

7. Visual Quality

The Visual Quality Objectives(VQO) described and proposed in Chapter 3 remain constant for all alternatives. Given these VQOs, no harvest is proposed within the "retention" area adjacent to the Wild and Scenic river corridor nor are any harvest activities proposed that could be seen from the corridor.

8. Management Areas

The Management Areas identified in Chapter 1 are identical for all alternatives, including the no action alternative. All of the action alternatives propose activities which are accepted under the Forest Plan which would guide the individual Management Areas toward their desired condition.

B. Alternatives Considered but Eliminated from Detailed Study

1. Maximum Roading Alternative

This alternative would have developed the transportation system planned for upper Swiftwater drainage to its full extent. If Swiftwater Creek had been at the 100% potential for fisheries habitat as displayed in Appendix A, it would have been feasible to implement this alternative. However, completion of site specific fisheries surveys in Swiftwater Creek have shown that it is below the "Fishery Water Quality Objective" displayed in Appendix A of the Forest Plan as 80%.

Determination that Swiftwater Creek is below its established fish/water quality objective of 80% resulted in requiring that management activity only be initiated if an upward trend in fish habitat potential could be maintained. It is not possible, even applying the maximum attainable mitigation of 80% to all proposed road construction and reconstruction, to implement this proposed scale of activity and insure that an upward trend would be maintained.

The ID Team dismissed this alternative from detailed study because it does not meet Forest Plan standards and guidelines for the management of fishery/water quality habitat.

2. Uneven-age Management Alternative

This alternative proposed initiating an uneven-age management regime for the entire Swiftwater analysis area. Any harvesting proposed under this alternative would have the objective of creating, or maintaining, an uneven-age forest.

Even versus uneven-age management is an issue in National Forest planning, mainly because clearcuts in uneven-age systems are very small, nearly unnoticeable. On the other hand, clearcuts in even-age systems can be up to 40 acres, and they can be larger if certain criteria are met [36 CFR 219.27(d)].

The Nez Perce Forest Plan Record of Decision states on page 20 that while even-age management will predominate on the Forest, uneven-age management will be considered on a case-by-case basis.

Uneven-age forests are characterized by trees of many ages and sizes intermingled throughout, as opposed to even-age forests, which are characterized by individual stands of varying ages. Balanced, natural uneven-age stands are not common on the Nez Perce National Forest. Past wildfires and other catastrophic natural phenomena have caused even-age stands to predominate.

Uneven-age harvest methods include single-tree selection and group selection. The objective is to maintain orderly growth of trees through a balanced range of diameter and age classes. Frequent harvest entries into each stand are required, probably once every 20 to 30 years. This cycle is repeated until all of the original stand is replaced by the regenerated stand.

The advantages and disadvantages of uneven-age management are set out on pp. 46-48, Chapter IV of the Forest Plan EIS and are incorporated here by reference. The basic problem in the

Swiftwater area would be imposing uneven-age silviculture on existing even-age stands. Many decades of partial cutting would be required to create new, uneven-age stands where physiologically possible. Even then, assurance of sustained timber yield would be low. Costs of management could increase significantly and assurances of success would remain questionable.

The feasibility of frequent entries on steep ground with skyline or helicopter logging equipment is also questionable. Part of the problem is residual tree damage such as broken tops and scraped trunks. In addition, frequent resetting of skylines for relatively small amounts of timber would drive up logging costs and make sales much less economically viable. In addition to economics, safety during helicopter logging would require removal of significant amounts of the existing tree canopy.

Finally, frequent entries into the same stands would also mean a wider distribution of harvest activities, which would increase disruption of big game and create impacts that would be difficult to mitigate. For these reasons, the ID team dismissed an uneven-age alternative for the entire area from detailed consideration. The detailed silvicultural prescriptions do evaluate the uneven-aged opportunities for those stands in the Swiftwater area that exhibit attributes which would contribute to the successful use of the system.

3. Helicopter Yarding Alternative

Because the Swiftwater drainage is below objective for fish/water quality (see Chapter 3) an alternative was developed that minimized new road construction/reconstruction and limited site disturbance during logging activities through low impact helicopter yarding of **all** proposed units.

Helicopter yarding is, and will remain, an important tool in the management of the Nez Perce National Forest. However, it is by far the most expensive yarding system being used in Northern Idaho. Logging costs, as well as future management costs, are commonly double or triple those of other logging methods.

Recent experiences on the Nez Perce indicate that economic helicopter logging requires large diameter and high value trees, short yarding distances, and small differences in elevation between the landing and the cutting units. Much of the Swiftwater area has attributes which could contribute to a feasible helicopter offering. Timber industry has expressed that, when possible, roads should be built to allow use of conventional skyline and tractor methods for economic reasons. Other interested parties such as the Idaho Department of Fish and Game have suggested alternatives that minimize road development for big game security.

On the Nez Perce Forest, helicopter logging is most appropriate in areas where roads cannot be built without unacceptable resource damage. The ID team developed two alternatives which would require helicopter yarding of some of the units in the Swiftwater area (alternatives 4 and 6). These alternatives result in very little change in the fish habitat capacity and would have little overall impact on the upward trend in this below objective watershed, even while constructing/ reconstructing a portion of the transportation system for conventional skyline or tractor yarding systems. These alternatives would generate viable timber sales which would meet or surpass Forest Plan standards.

4. Minimum Standard Road Alternative

Alternatives that used only short term roads were considered. Under the short term road concept two basic roading methodologies were assessed. The first considers using roads for a short term only (from three to five years) and then obliterating them. The second considers building, using, and obliterating roads all within the same field season. Each of these methodologies were evaluated as to how they would affect five areas of concern: protection from sedimentation, future area management, design standards, road costs, and effects upon wildlife.

Some understanding of how the two methodologies would be implemented is appropriate at this point. Under the first, roads would be constructed by the timber purchaser, to the standards necessary for the project needs, and would remain in place until the necessary post sale work (site preparation, brush disposal, and planting) was accomplished, and then would be obliterated by recontouring (either the full length or selected sections), grass seeding, and pulling available slash over the roadway. Further road maintenance would not be scheduled nor would the facility be available for management use.

Under the second methodology roads would be constructed by the purchaser, to the standards necessary for the project needs, used, and obliterated by recontouring, grass seeding, and pulling slash over the corridor all within the same field season. The road(s) would not be available for post sale activities (site preparation, brush disposal, and planting) nor would they be available for further management use. Obviously, under this scenario there is a practical limit, due to time frames, as to how much road work and harvest can be accomplished in one field season. Generally, roads of this type are best suited to locations where no significant construction or resource concerns are apparent and construction and clearing controls can be adequately provided with a centerline flagline.

The mitigation of sediment, and effects upon watersheds due to sedimentation from road construction is an important consideration in the Upper Swiftwater analysis area as it is elsewhere on the forest. Much work has been performed assessing the effects of road construction and road maintenance upon watersheds and a number of mitigation measures that effectively limit potential sediment have been developed. Effective mitigation measures include windrowing of construction slash below the toe of the fill, designed and controlled cut and fill slopes, designed and controlled road drainage, grass seeding, and aggregate surfacing of the roadway. Research, including that conducted in the Horse Creek Experimental Watershed on the Selway District of Nez Perce National Forest indicates that sediment production decreases exponentially from the time of ground disturbance. Road obliteration, particularly recontouring, is an activity that could constitute a "redisturbance", subsequently causing an increase in sediment production, especially if the obliteration were not performed in the same field season. Given the landforms in this analysis area it is likely that recontouring a road that is three to five years of age would cause sedimentation impacts. Given the landforms in the analysis area it is impractical to construct, use, and obliterate roads in the same field season that would provide access to the areas being identified for treatment.

Future management needs are an important consideration in the determination of land access. While waiting until immediate post sale activities are complete prior to obliterating roads would allow access through the project, opportunities to respond to wildfires would not be realized, and continuing stand management and resource activities such as inventories would be more expensive. Also, future management within the analysis area that would require roaded access would be limited.

Road costs are understandably an area of concern. The cost of a road is dependent upon many factors, some of the most notable being the road standard, and the landform the road traverses.

It is importatnt to remember that regardless of the type of road, either temporary (short term) or part of the continuing forest transportation system the minimum road standard needed to provide for safe operation of equipment are the same. Forest Service Handbooks (FSH 7709.56 and Region 1 Supplement 7709.56-90-1) describe minimum dimensions for the traveled way that depend on the design vehicle, among other things. Mitigation measures typically increase costs, it is possible to realize cost savings by constructing a single season temporary road instead of a system road. Building temporary roads eliminates some of the mitigation requirements necessary to ensure that a road would adequately withstand the annual hydrologic cycle. In the Upper Swiftwater analysis area, due to sideslopes, and subsequent construction requirements such as end haul, a centerline flagline is insufficient to adequately control and define construction. Because of this, much of the potential to achieve cost savings through the use of single season roads is lost. Also, obliteration costs are tied to landform; costs increase substantially as landforms steepen. Recent experience on the Nez Perce National Forest reveal obliteration costs of up to 40% of the cost of new construction on gentler landforms.

The obliteration of short term roads would reduce the vulnerability of big game, primarily elk. While the closing of system roads does prevent vehicle access, it does not prevent easy foot access as an obliterated road does. Still, the degree to which even foot access is prohibited in the road corridor is dependent on how well slash and other obstacles are placed over the obliterated surface.

Upon the consideration of these factors; ability to control and limit potential sediment production, future area management needs, design standards and road costs, and effects upon wildlife, the IDT eliminated from detailed consideration an alternative that would use solely short term roads. The use of short term roads is included in the alternatives considered for detailed consideration where appropriate.

C. Alternatives Considered in Detail

The requirements of NEPA are applied early in the planning process (40 CFR 1501.2). For that reason, harvest unit boundaries and silvicultural prescriptions could undergo insignificant changes during final layout. Minor changes in unit boundaries and silvicultural prescriptions would be considered insignificant and would not require an amendment or revision of this EIS. Advertisement of a timber sale in fiscal year 1993 as proposed by this EIS could be altered because of Federal or local economies or other events beyond the control of the Nez Perce National Forest. These situations should not affect the environmental effects displayed in Chapter Four. If it is determined that a changed condition is significant to the effects displayed in this EIS then a supplement would be necessary.

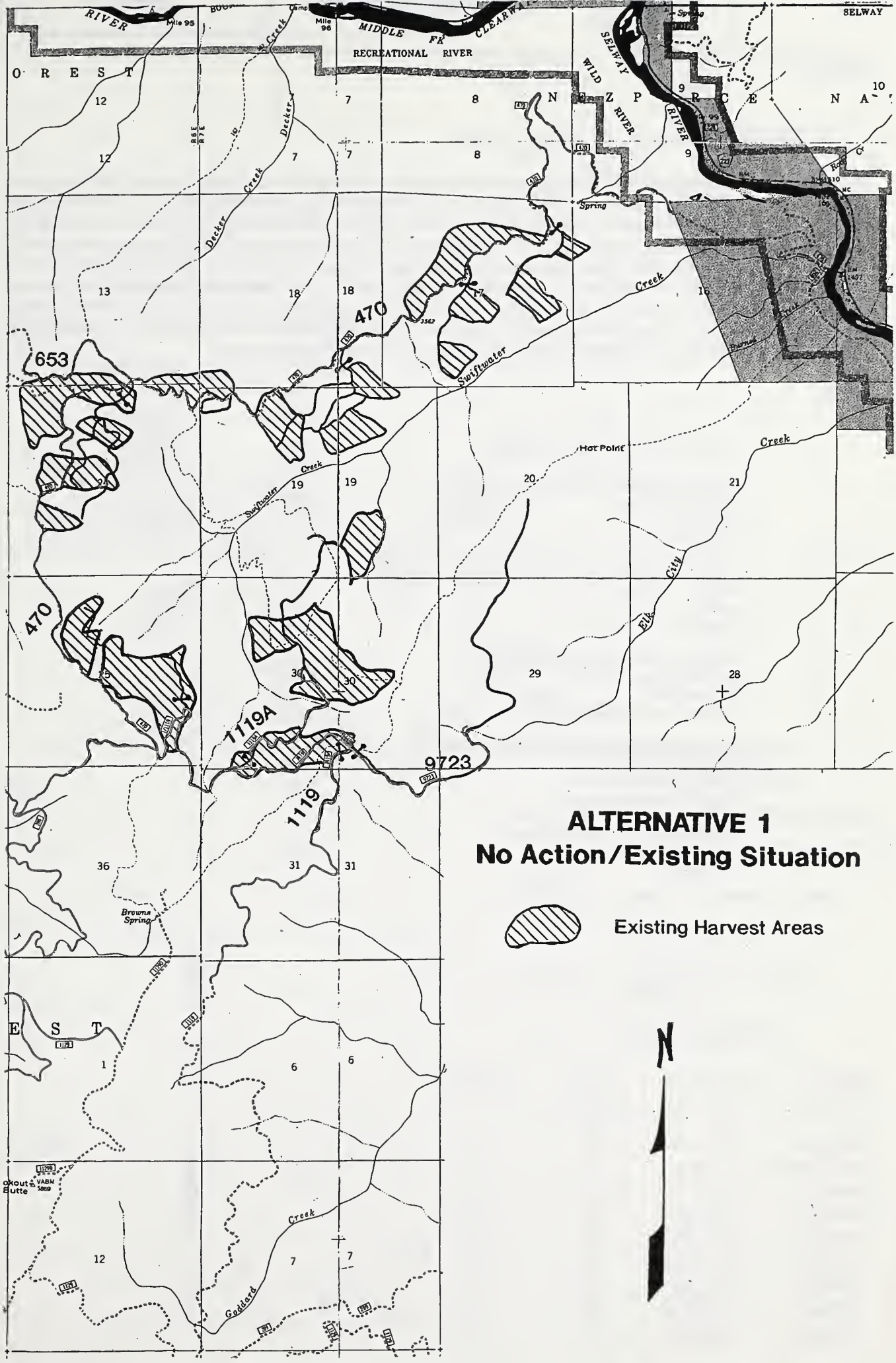
The alternatives displayed in the following pages have been developed in response to the issues identified in Chapter 1 and as a means to move toward the desired conditions within the Management Areas located within the Swiftwater analysis area. The proposed action and the IDT recommended alternative are identified.

1. Alternative One- No Action

This is the No Action alternative. Neither the proposed action (alternative two) nor any other action alternative would be implemented at this time under this alternative. The existing land and resource conditions and management would be maintained as described in Chapter Three. Impacts would be the result of natural processes; there would be no progress toward the desired condition in Management Areas which require management to reach such.

The existing visual quality would be maintained, shaped only by the acts of nature. Recreation opportunities would not be impacted. Elk habitat would effectiveness would remain below Forest Plan objectives in the Goddard Elk Habiata Evaluation Area. Opportunities for timber management would be delayed or lost. None of the overmature and high-risk timber in the area would be harvested; timber stand improvement and regeneration activities would not occur. Water quality improvements scheduled would be implemented as planned, however funding for these projects to be completed would not be guaranteed.

	Acres	Volume
TOTAL AREA TO BE TREATED (ACRES)	0	0
CUTTING METHODS TO BE USED (ACRES)		
Clearcut	0	0
Seed Tree	0	0
Shelterwood	0	0
LOGGING SYSTEMS TO BE USED (ACRES)		
Tractor	0	0
Skyline	0	0
Helicopter	0	0
TYPE OF ROAD CONSTRUCTION (MILES)		
New Construction	0	
Reconstruction	0	
Temporary with Obliteration	0	
POST HARVEST SITE PREPARATION (ACRES)		
Broadcast Burn	0	
Underburn	0	
Grapple Pile and Hand Burn	0	
HARVEST ON ELK HABITAT (ACRES)		
Summer Range	0	
Winter Range	0	



ALTERNATIVE 1
No Action/Existing Situation

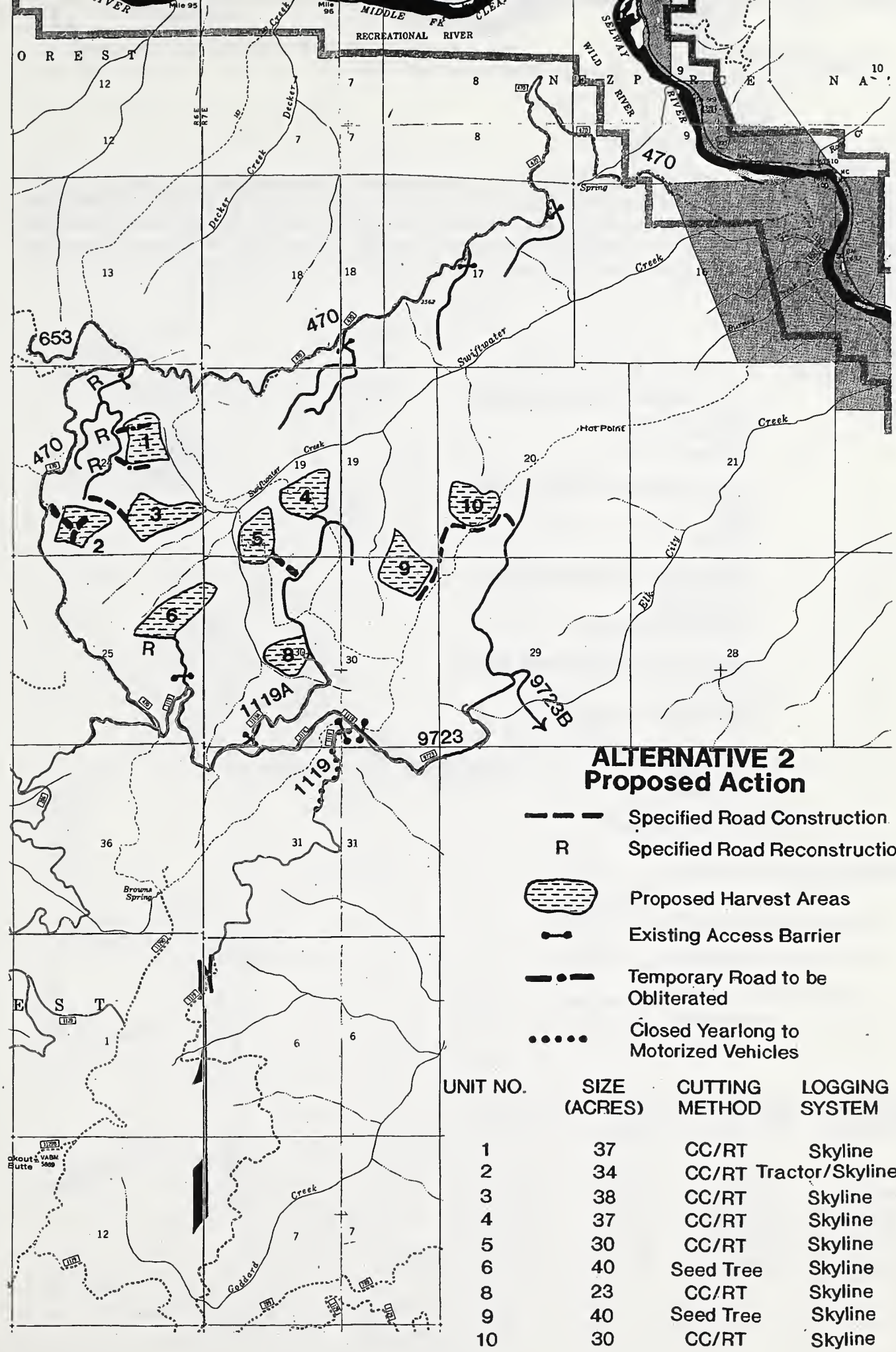
Existing Harvest Areas

N

2. Alternative Two - Proposed Action

Alternative two is the action proposed as a result of the Integrated Resource Analysis (IRA) required by NFMA. This alternative would initiate timber harvest on approximately 309 acres of elk summer range using only conventional logging methods (tractor and skyline) to give about 8.9 MMBF of conifer saw timber. The road system proposed would be the greatest of any of the alternatives with a total of 3.62 miles which would provide the most access for future resource management. The proposed harvest would treat high-risk timber stands with root disease and those stands which are over-mature. As part of this alternative road #1119, from its junction with road #9723 to it's junction with road #1129, would be closed to all motorized vehicled year-round. This proposed road closure would enhance elk habitat potential in the Goddard elk evaluation area.

	Acres	Volume
TOTAL AREA TO BE TREATED (ACRES)	309	8.9
CUTTING METHODS TO BE USED (ACRES)		
Clearcut w/Reserves	229	7.0
Seed Tree	80	1.9
Shelterwood	0	0
LOGGING SYSTEMS TO BE USED (ACRES)		
Tractor	34	1.2
Skyline	275	7.7
Helicopter	0	0
TYPE OF ROAD CONSTRUCTION (MILES)		
New Construction	1.90	
Reconstruction	0.95	
Temporary with Obliteration	0.77	
POST HARVEST SITE PREPARATION (ACRES)		
Broadcast Burn	195	
Underburn	80	
Grapple Pile and Hand Burn	34	
HARVEST ON ELK HABITAT (ACRES)		
Summer Range	309	
Winter Range	0	

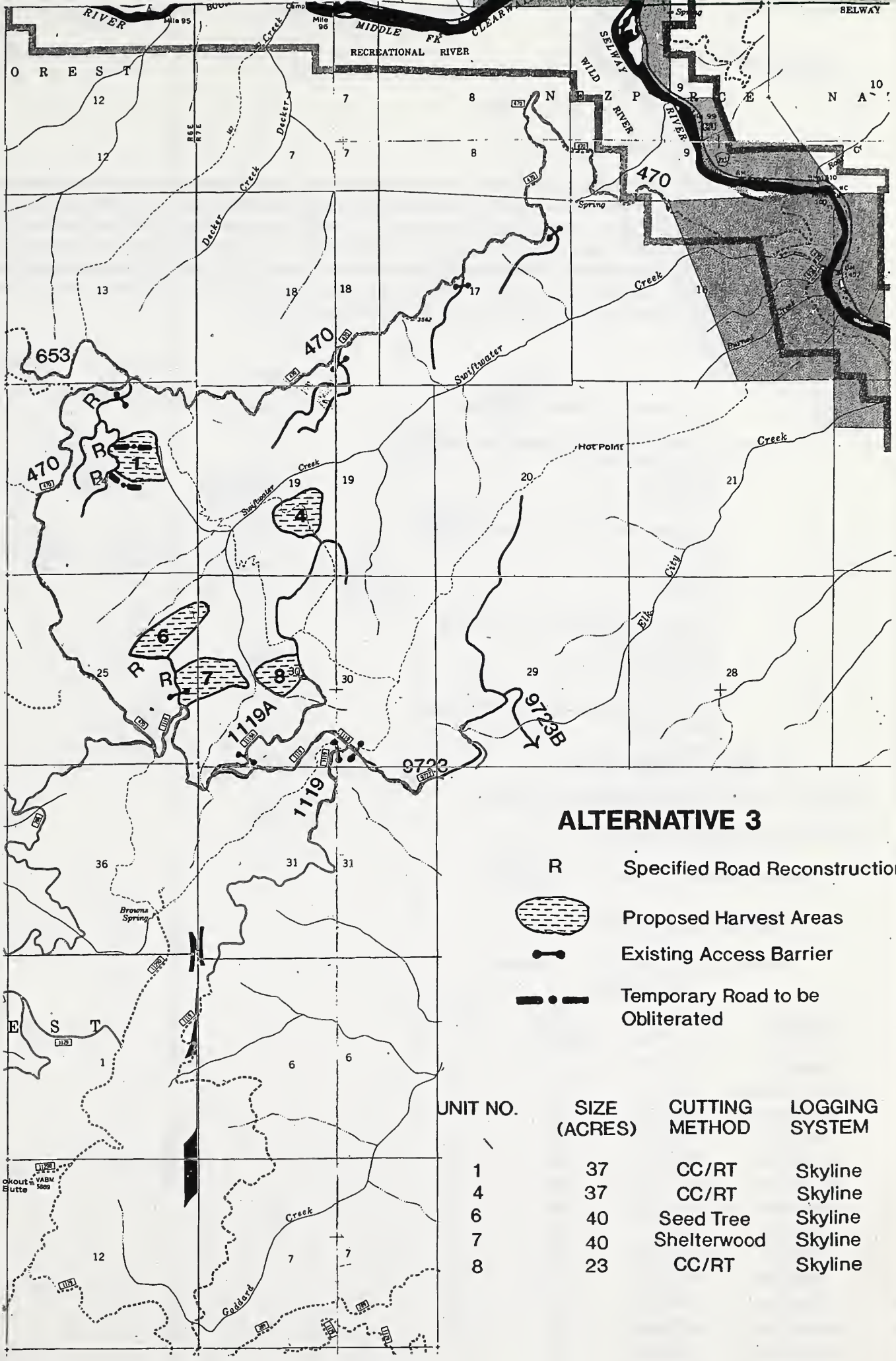


UNIT NO.	SIZE (ACRES)	CUTTING METHOD	LOGGING SYSTEM
1	37	CC/RT	Skyline
2	34	CC/RT	Tractor/Skyline
3	38	CC/RT	Skyline
4	37	CC/RT	Skyline
5	30	CC/RT	Skyline
6	40	Seed Tree	Skyline
8	23	CC/RT	Skyline
9	40	Seed Tree	Skyline
10	30	CC/RT	Skyline

3. Alternative Three

This alternative concentrates timber harvest activities that would be accessible without constructing new permanent roads. Although no new roads are proposed, approximately 1.3 mile of road would be reconstructed and about 0.40 miles of temporary road would be constructed to be obliterated after use. This alternative would harvest approximately 177 acres of elk summer range using conventional skyline logging systems to yield 4.1 MMBF of conifer saw timber.

	Acres	Volume
TOTAL AREA TO BE TREATED (ACRES)	177	4.1
CUTTING METHODS TO BE USED (ACRES)		
Clearcut w/Reserves	97	2.6
Seed Tree	40	0.8
Shelterwood	40	0.7
LOGGING SYSTEMS TO BE USED (ACRES)		
Tractor	0	0
Skyline	177	4.1
Helicopter	0	0
TYPE OF ROAD CONSTRUCTION (MILES)		
New Construction	0	
Reconstruction	1.30	
Temporary with Obliteration	0.40	
POST HARVEST SITE PREPARATION (ACRES)		
Broadcast Burn	97	
Underburn	80	
Grapple Pile and Hand Burn	0	
HARVEST ON ELK HABITAT (ACRES)		
Summer Range	177	
Winter Range	0	



ALTERNATIVE 3

R — Specified Road Reconstruction

Proposed Harvest Areas

Existing Access Barrier

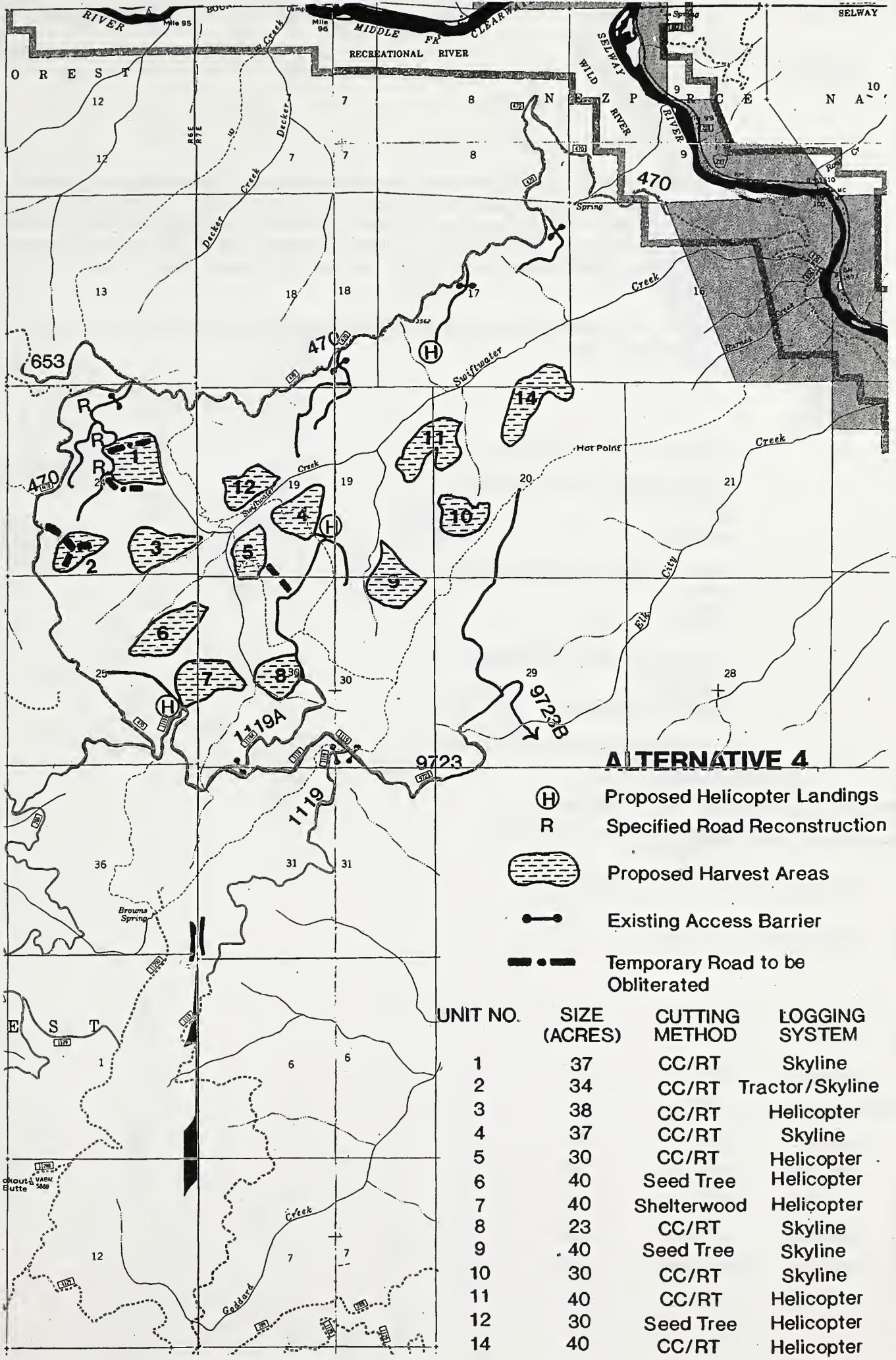
Temporary Road to be Obliterated

UNIT NO.	SIZE (ACRES)	CUTTING METHOD	LOGGING SYSTEM
1	37	CC/RT	Skyline
4	37	CC/RT	Skyline
6	40	Seed Tree	Skyline
7	40	Shelterwood	Skyline
8	23	CC/RT	Skyline

4. Alternative Four

Alternative four proposes for harvest the maximum volume that can be harvested in the Swiftwater drainage at this time while complying with the Nez Perce Forest Plan standards and guidlines. This alternative proposes to harvest approximately 13.1 MMBF of conifer saw timber over 459 acres of which 429 would be elk summer range and 30 elk winter range. This alternative provides the most helicopter volume and also uses conventional skyline and tractor methods. This alternative proposes the least road construction of the action alternatives with only 0.95 miles of reconstruction and 0.77 miles of temporary road that would be obliterated after use.

	Acres	Volume
TOTAL AREA TO BE TREATED (ACRES)	459	13.1
CUTTING METHODS TO BE USED (ACRES)		
Clearcut w/Reserves	309	9.5
Seed Tree	110	2.9
Shelterwood	40	0.7
LOGGING SYSTEMS TO BE USED (ACRES)		
Tractor	34	1.2
Skyline	97	3.3
Helicopter	328	8.6
TYPE OF ROAD CONSTRUCTION (MILES)		
New Construction	0	
Reconstruction	0.95	
Temporary with Obliteration	0.77	
POST HARVEST SITE PREPARATION (ACRES)		
Broadcast Burn	275	
Underburn	150	
Grapple Pile and Hand Burn	34	
HARVEST ON ELK HABITAT (ACRES)		
Summer Range	429	
Winter Range	30	



ALTERNATIVE 4

- (H) Proposed Helicopter Landings
- R Specified Road Reconstruction
- Proposed Harvest Areas
- Existing Access Barrier
- Temporary Road to be Obliterated

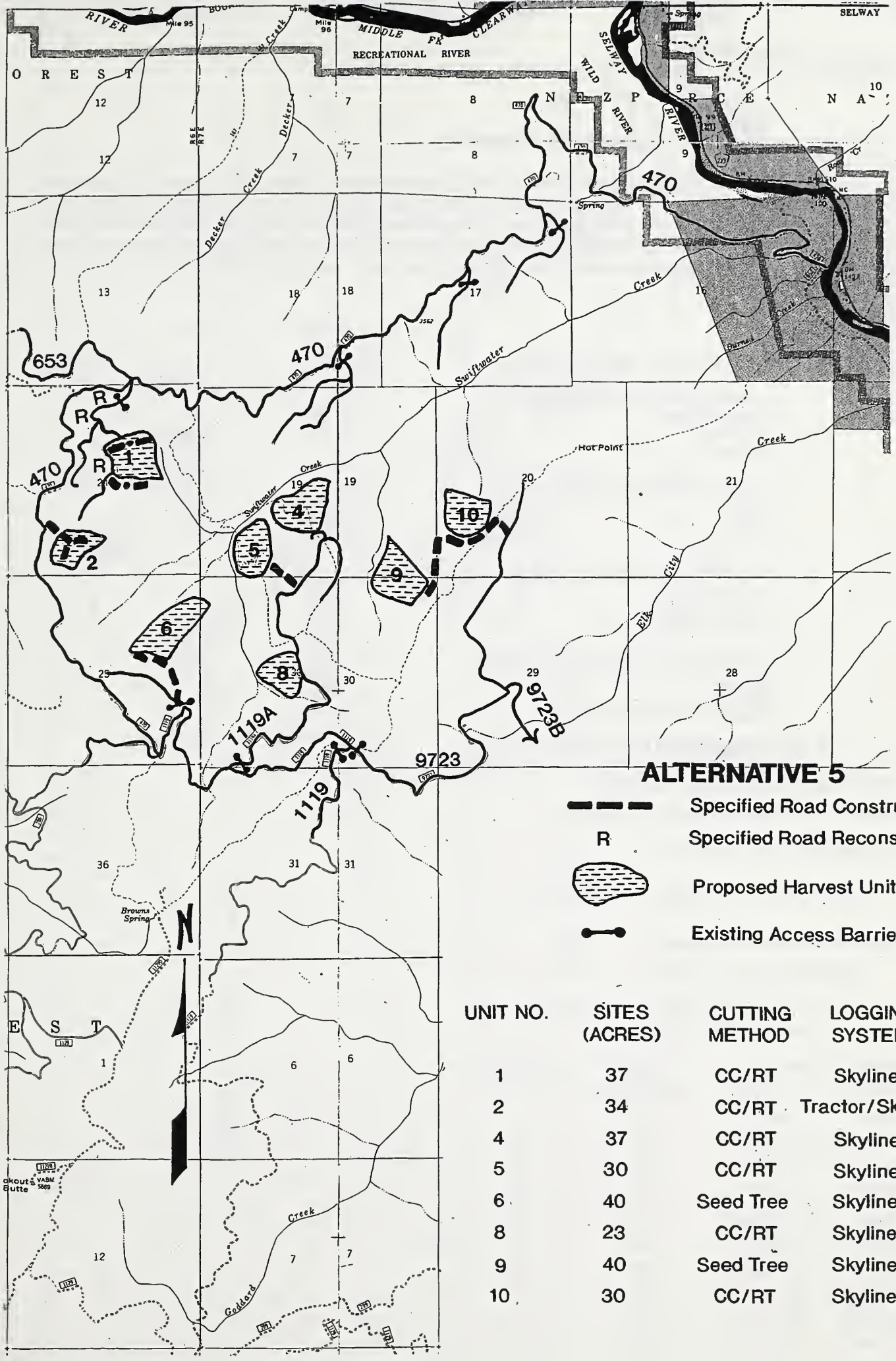
UNIT NO.	SIZE (ACRES)	CUTTING METHOD	LOGGING SYSTEM
1	37	CC/RT	Skyline
2	34	CC/RT	Tractor/Skyline
3	38	CC/RT	Helicopter
4	37	CC/RT	Skyline
5	30	CC/RT	Helicopter
6	40	Seed Tree	Helicopter
7	40	Shelterwood	Helicopter
8	23	CC/RT	Skyline
9	40	Seed Tree	Skyline
10	30	CC/RT	Skyline
11	40	CC/RT	Helicopter
12	30	Seed Tree	Helicopter
14	40	CC/RT	Helicopter

5. Alternative Five

Alternative five is very similar to alternative two in purpose where only conventioanl logging methods would be used and harvest would be concentrated on elk summer range. The difference in these alternatives is that this alternative would not harvest unit #3 and it provides for different access to units #2, #5, and #6 (see map to right). The major difference is the access to unit #6, where alternative two would reconstruct road #1119D this alternative would newly construct a road parrallel to road #1119D.

This alternative would yield approximately 8.0 MMBF of conifer saw timber while harvesting 311 acres of elk summer range.

	Acres	Volume
TOTAL AREA TO BE TREATED (ACRES)	311	8.0
CUTTING METHODS TO BE USED (ACRES)		
Clearcut w/Reserves	231	6.6
Seed Tree	80	1.4
Shelterwood	0	0
LOGGING SYSTEMS TO BE USED (ACRES)		
Tractor	34	1.2
Skyline	277	6.8
Helicopter	0	0
TYPE OF ROAD CONSTRUCTION (MILES)		
New Construction	1.50	
Reconstruction	0.95	
Temporary with Obliteration	0.82	
POST HARVEST SITE PREPARATION (ACRES)		
Broadcast Burn	157	
Underburn	80	
Grapple Pile and Hand Burn	34	
HARVEST ON ELK HABITAT (ACRES)		
Summer Range	311	
Winter Range	0	



ALTERNATIVE 5

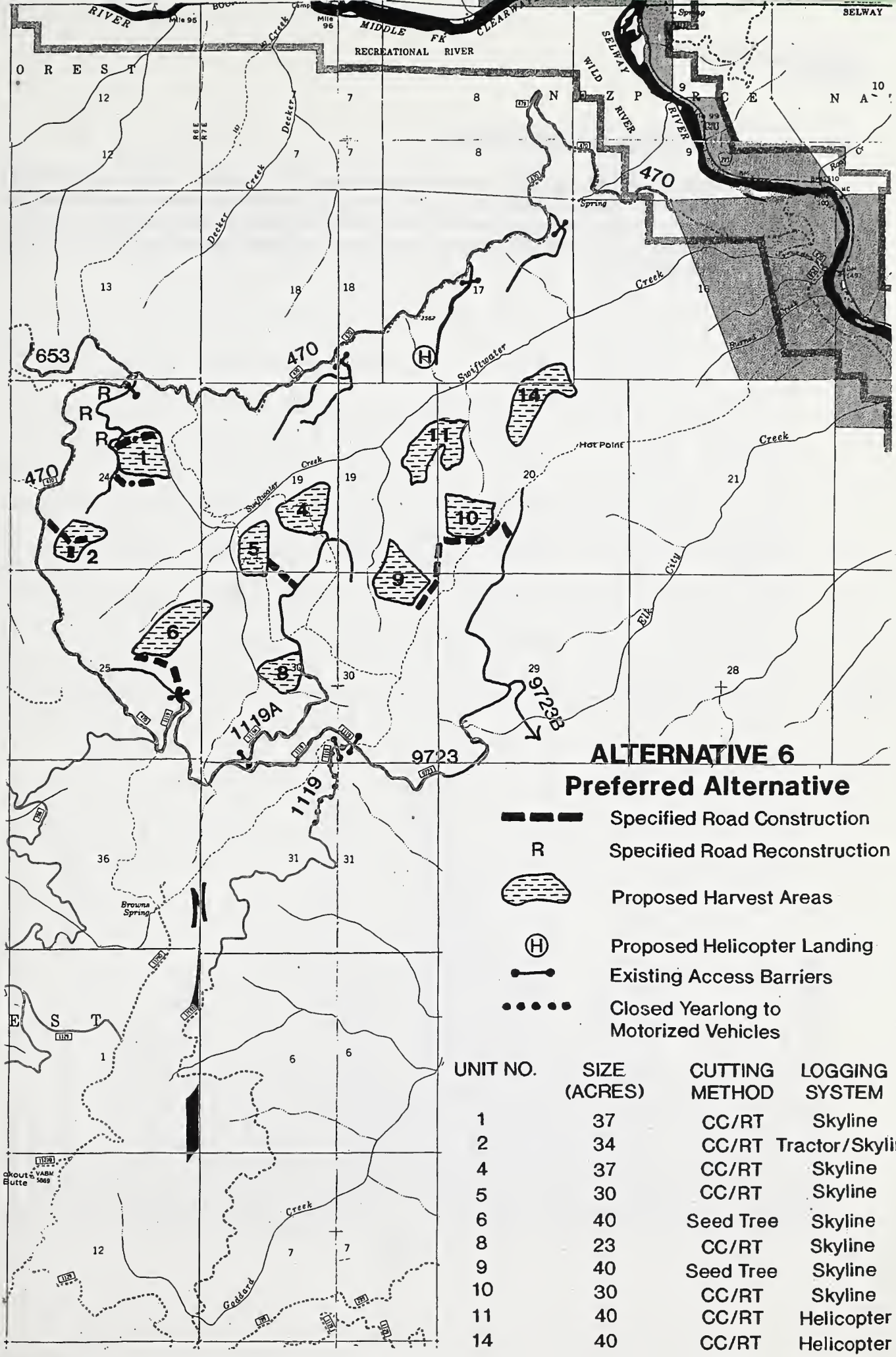
- Specified Road Construction
- R — Specified Road Reconstruction
- Proposed Harvest Units
- Existing Access Barrier

UNIT NO.	SITES (ACRES)	CUTTING METHOD	LOGGING SYSTEM
1	37	CC/RT	Skyline
2	34	CC/RT	Tractor/Skyline
4	37	CC/RT	Skyline
5	30	CC/RT	Skyline
6	40	Seed Tree	Skyline
8	23	CC/RT	Skyline
9	40	Seed Tree	Skyline
10	30	CC/RT	Skyline

6. Alternative Six - Preferred Alternative

Alternative six is the preferred alternative of the Interdisciplinary Team. This alternative proposes to harvest the same units as in alternative five with an additional 80 acres of helicopter logging for a total of 10.4 MMBF of conifer saw timber to be harvested from 351 acres. This alternative would also close road #1119, from its junction with road #9723 to its junction with road #1129, year-long to all motorized vehicles to enhance elk summer range within the Goddard Elk Evaluation Area.

	Acres	Volume
TOTAL AREA TO BE TREATED (ACRES)	351	10.4
CUTTING METHODS TO BE USED (ACRES)		
Clearcut w/Reserves	271	9.0
Seed Tree	80	1.4
Shelterwood	0	0
LOGGING SYSTEMS TO BE USED (ACRES)		
Tractor	34	1.2
Skyline	237	6.8
Helicopter	80	2.4
TYPE OF ROAD CONSTRUCTION (MILES)		
New Construction	1.50	
Reconstruction	0.95	
Temporary with Obliteration	0.82	
POST HARVEST SITE PREPARATION (ACRES)		
Broadcast Burn	237	
Underburn	80	
Grapple Pile and Hand Burn	34	
HARVEST ON ELK HABITAT (ACRES)		
Summer Range	351	
Winter Range	0	



ALTERNATIVE 6
Preferred Alternative

- Specified Road Construction
- R — Specified Road Reconstruction
- Proposed Harvest Areas
- Ⓗ — Proposed Helicopter Landing
- Existing Access Barriers
- Closed Yearlong to Motorized Vehicles

UNIT NO.	SIZE (ACRES)	CUTTING METHOD	LOGGING SYSTEM
1	37	CC/RT	Skyline
2	34	CC/RT	Tractor/Skyline
4	37	CC/RT	Skyline
5	30	CC/RT	Skyline
6	40	Seed Tree	Skyline
8	23	CC/RT	Skyline
9	40	Seed Tree	Skyline
10	30	CC/RT	Skyline
11	40	CC/RT	Helicopter
14	40	CC/RT	Helicopter

III COMPARISON OF ALTERNATIVES

Tables on the following pages compare the alternatives with respect to the issues identified in Chapter 1. Table 2.3 compares the alternatives by other resource items. These tables **do not** assign point values or rank the alternatives in any way; these tables are provided to assist in the comparison of the alternatives through a summarized display of information from from Chapters 3 and 4.

TABLE 2.2- COMPARISON OF ALTERNATIVES BY ISSUE

ISSUE	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6
VISUAL QUALITY						
*ACRES HARVESTED WITHIN OR SEEN FROM THE WILD AND SCENIC CORRIDOR	0	0	0	0	0	0
ELK HABITAT						
*ACRES OF WINTER RANGE HARVESTED	0	0	0	30	0	0
*ACRES OF SUMMER RANGE HARVESTED	0	309	177	429	311	351
SOILS, HYDROLOGY, AND FISHERIES						
*WILL UPWARD TREND OCCUR?	YES	YES	YES	YES	YES	YES
*ESTIMATED SEDIMENT CREATED[1]	10/10	31/11	19/10	19/11	28/11	28/11
*AVERAGE CHANGE IN FISH CAPACITY A/B CHANNELS (%)[2]	0	-3/-4	-2/-3	-2/-3	-2/-4	-3/-4
*ACRES OF RIPARIAN HARVEST	0	0	0	0	0	0
BIOLOGICAL DIVERSTIY, FRAGMENTATION, AND ECOSYSTEM MANAGEMENT						
*SUSTAIN NATURAL ENVIRONMENT AND PROCESSES	YES	YES	YES	YES	YES	YES
*ACRES OF MA 20 HARVEST	0	0	0	0	0	0
*HARVEST ACRES OF STANDS W/REPLACEMENT OLD GROWTH CHARACTERISTICS (NOT MA 20)	0	232	63	345	234	274
*HARVEST ACRES OF STANDS W/EXISTING OLD GROWTH CHARACTERISTICS (NOT MA 20)	0	77	114	114	77	77
THREATENED, ENDANGERED AND SENSITIVE SPECIES						
*WOULD ANY T OR E SPECIES BE ADVERSELY AFFECTED	NO	NO	NO	NO	NO	NO
*DO SENSITIVE SPECIES POPULATIONS REMAIN VIABLE	YES	YES	YES	YES	YES	YES
TRANSPORTATION SYSTEM						
*MILES OFPERMANENT NEW ROAD CONSTRUCTION	0	1.90	0	0.95	1.50	1.50
*MILES OF ROAD RECONSTRUCTION	0	0.95	1.30	0	0.95	0.95
*MILES OF TEMPORARY ROAD TO BE OBLITERATED	0	0.77	0.41	0.77	0.82	0.82
SOCIAL AND ECONOMIC						
*VALUE TO COST RATIO (DLOG VALUE)	0	1.04	1.03	0.99	1.03	1.02
*TOTAL PNV (Dollars)	0	389,458	119,097	88,313	394,890	318,029
*ACRES OF CLEARCUT HARVEST	0	229	97	429	231	231

[1] NEZSED VALUES AT YEARS 1 AND 5 (Per Cent Overbase)
[2] AVERAGE FISHSED VALUES FOR ALL SPECIES COMBINED

TABLE 2.3- COMPARISON OF ALTERNATIVES BY OTHER RESOURCES

RESOURCE	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6
HARVEST SYSTEMS						
*VOLUME (MMBF)	0	8.9	4.1	13.1	8.0	10.4
*TOTAL ACRES	0	309	177	459	311	351
*HELICOPTER VOLUME	0	0	0	8.6	0	2.5
*ACRES OF HELICOPTER	0	0	0	328	0	80
*SKYLINE VOLUME	0	7.7	4.1	3.3	6.8	6.7
*ACRES SKYLINE	0	275	177	97	277	237
*TRACTOR VOLUME	0	1.2	0	1.2	1.2	1.2
*ACRES TRACTOR	0	34	0	34	34	34
SILVICULTURAL PRESCRIPTIONS						
*ACRES CLEARCUT WITH RESERVES	0	229	97	309	231	271
*ACRES SEED TREE	0	80	40	110	80	80
*ACRES SHELTERWOOD	0	0	40	40	0	0
ACCESS MANAGEMENT						
*PROPOSED ROADS CLOSED AFTER ACTIVITY	N/A	YES	YES	YES	YES	YES
*WILL THERE BE ADDITIONAL ROAD CLOSURES	N/A	YES	NO	NO	NO	YES

Chapter Three

Affected Environment

CHAPTER THREE

AFFECTED ENVIRONMENT

I. INTRODUCTION

This chapter describes the environment that may be changed by implementation of the proposed action or an alternative action in the Swiftwater assessment area. It describes the baseline conditions against which environmental effects can be evaluated, and from which progress toward the desired condition can be measured. Data and analysis are commensurate with the importance of the possible impacts (40 CFR 1502.15); and relevant discussion in the Forest Plan EIS is incorporated by reference (40 CFR 1502.21). Discussion in this chapter is separated into two sections; issue related resources and other resources.

II. DISCUSSION OF ISSUE RELATED RESOURCES

A. Visual Resources

This section on visual quality concentrates on the existing management objectives for the Swiftwater analysis area. The aesthetics of clearcutting and the controversies surrounding that issue are clearly social and are therefor discussed in the Social and Economic portion (section H), of this chapter and also chapters three and four. These sections should be referenced for further information on the issue of clearcutting.

The Forest Plan, as amended by Amendment No. 4, specifies that visual quality objectives (VQOs) will be adopted during Forest Plan implementation. VQOs were inventoried and mapped as part of the Forest planning process, but only those VQOs for classified lands and other areas of extreme visual sensitivity were formally adopted in the Plan. Interim VQOs were established for specific management areas in combination with other resource goals, but decisions on their adoption were deferred to site specific project planning.

To determine the visual quality objective for the area it was necessary to evaluate the importance of the visual resource to the potential viewing public. This process develops sensitivity levels for the land areas being viewed by those who are traveling through the Forest on roads and trails; recreating along the river; or using developed or dispersed recreation sites. There are three sensitivity levels identified for the area:

Sensitivity Level 1 - The Selway River Road, and the Selway River within and adjacent to the assessment area; and all recreational developments and private properties in or adjacent to the Wild and Scenic River.

Sensitivity Level 2 - Forest Road 470 within and adjacent to the assessment area.

Sensitivity Level 3 - All other roads and trails in, or viewing, the area.

All areas seen from Sensitivity Level 1 viewing locations have visual quality objectives of retention or partial retention. Those areas within the legal boundaries of the Wild and Scenic River, as well as the lands that can be seen in the foreground which are immediately adjacent to this corridor, are to be managed to meet the VQO of retention. There are 176 acres held in non-forest ownership included in this category.

Areas in the middleground when viewed from the Sensitivity Level 1 viewing locations have been assigned the VQO of partial retention.

Those areas not assigned a VQO of retention or partial retention have a designated VQO of modification.

TABLE 3.1- DESCRIPTION OF VISUAL QUALITY OBJECTIVES

VISUAL QUALITY OBJECTIVE	DEFINITION	ACRES
RETENTION	Management activities are not visually evident to the casual observer	133 (plus an additional 176 acres of private land)
PARTIAL RETENTION	Management activities remain visually subordinate to the characteristic landscape.	497 (plus an additional 17 acres of private land)
MODIFICATION	Management activities may visually dominate the landscape, but must borrow from naturally established form, line, texture, and color so they appear similar to natural occurrences.	3,442 (plus an additional 43 acres of private land)

The IDT recommends the use of these VQO's. The Record of Decision for this analysis will either adopt these VQOs as final or propose changes to be made. This analysis is based on the assupmtion that the VQOs will be adopted as final as they are shown in the project file.

B. Elk Habitat

The Swiftwater area provides year-round elk range. Approximately 70% of the 4000 acre Swiftwater study area is considered elk summer range. Moderate to heavy elk use occurs in the headwaters of Swiftwater Creek and on the ridge adjoining Elk City Creek; use on the north slopes of Swiftwater Creek is light to negligible. A significant number of the elk using the Swiftwater area also use the available habitat in Goddard Creek.

The Swiftwater analysis area includes approximately 1100 acres of elk winter range, 30% of the study area (MA 16 plus adjacent MA 20 and MA 10). Winter range is characterized by 50 to 80 percent slopes from 1400 to 4200 feet in elevation on southerly exposures. Elk use on this winter range is currently light to moderate. It is expected to increase significantly during the next few years as the local wintering elk population increases in response to the additional forage created by harvesting and broadcast burning of slash on the previous Swiftwater timber sale which was active during 1988 through 1991.

Approximately 800 acres of the 1100 acres of winter range are designated as MA 16 and suitable to manage for elk winter range. The remaining 300 acres are dedicated for old growth coniferous forest and riparian area management. The desired condition for elk winter range is to have 15 to 20% of the winter range in a forage producing condition.

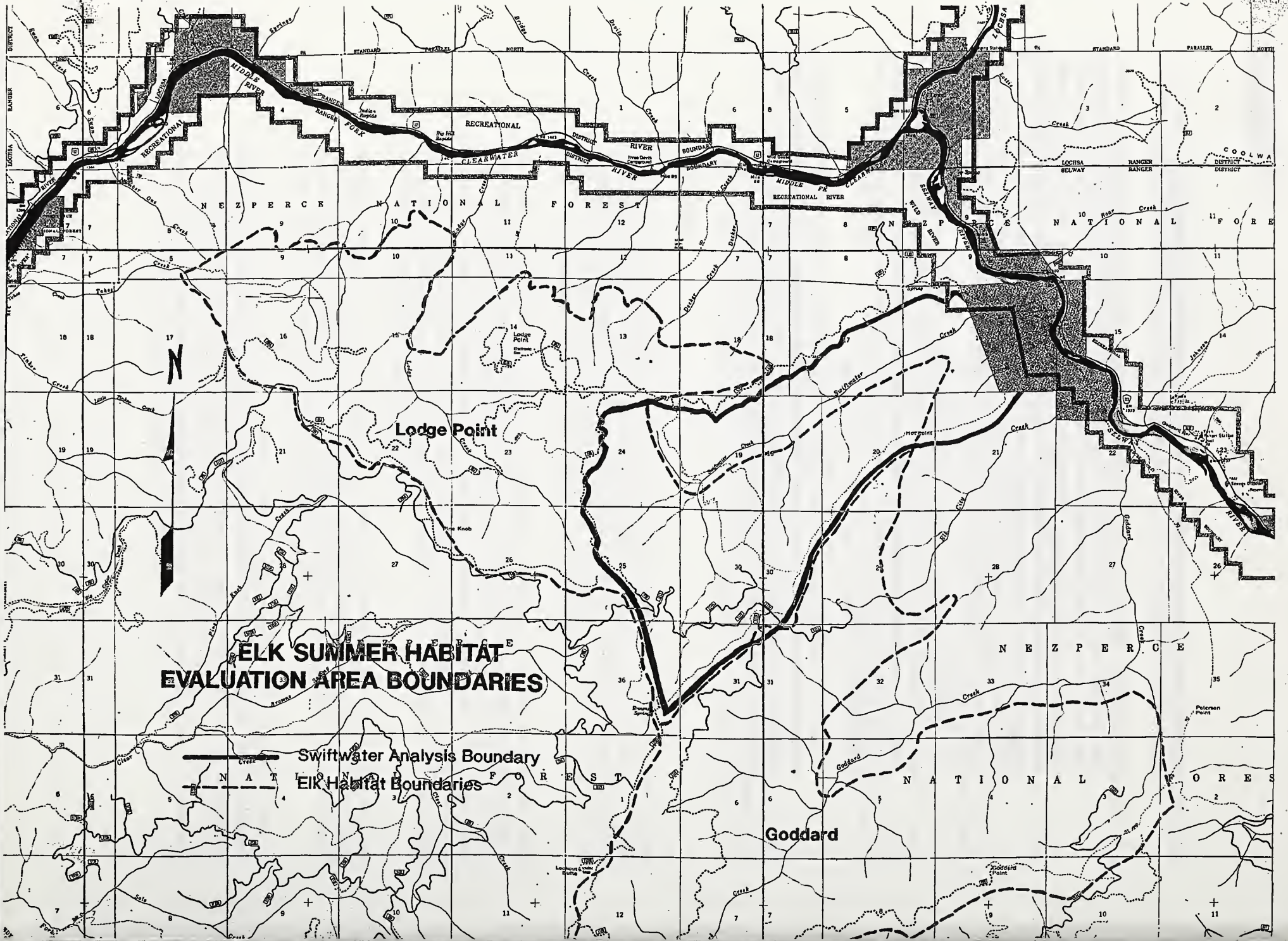
Within the 800 acres of suitable, manageable winter range considered for this analysis, approximately 160 acres, 20%, are currently occupied by recently created seral brushfield. These areas were created by seven timber harvest units of the Swiftwater timber sale. These areas will be producing winter elk forage at a level determined to be adequate within the study area for the next 15-20 years. This recent harvesting meets the desired condition for winter range management in MA 16 for the Upper Swiftwater analysis area.

Hunting pressure is heaviest adjacent to Roads 470 and 1119. The steep rugged country that dominates the study area is difficult to access and receives relatively light hunting pressure.

The Swiftwater analysis area lies primarily within the Lodge Point Elk Evaluation Area. Proposed harvest activity would not occur in, but haul of timber could take place through the Goddard Elk Evaluation Area. These Evaluation Areas include all of the summer range within the Lodge, Decker, Swiftwater, Elk City, and Goddard Creek drainages. The current summer range habitat effectiveness in the Elk Habitat Evaluation Areas (EHAU) is 53% and 70% respectively for Lodge Point and Goddard. Approximately 32% and 45% of the Lodge and Goddard EHAU's serve as elk security areas, respectively. Habitat objectives for the two EHAU's are 50% and 75%, respectively. The Goddard area is currently below habitat objective.

Opportunities to improve or protect elk habitat include: 1) diversifying forage by planting preferred grass and forb forage species on designated skid trails, landings, and temporary roads; 2) road closures to assure Forest Plan objectives for elk habitat can be accomplished, and; 3) collect K-V funds to administer and patrol road closures for big game habitat and watershed protection.

Additional discussion of elk populations, habitat, and prescribed management practices can be found in the Forest Plan EIS on pages II-82 through 90, III-34 through 44, IV-18 through 21, and Appendix B of the Forest Plan. Specific information regarding the Elk Evaluation Areas is contained within the project file and are incorporated here by reference.


ELK SUMMER HABITAT
EVALUATION AREA BOUNDARIES
Swiftwater Analysis Boundary
Elk Habitat Boundaries
Lodge Point
Goddard
N
NEZPERCE NATIONAL FOREST
MIDDLE FORK CLEARWATER RIVER
RECREATIONAL RIVER
SELWAY RIVER
RANGER DISTRICT
BOUNDARY

C. Soils, Watershed, and Fisheries

1. Soils

Most of the soils of the Swiftwater are volcanic ash influenced loess over weathered material and underlain by hard crystalline rocks or quartzite. There is a range within these soil types in soil productivity, erosion potential, and ease of regeneration. A more detailed description of the land types and their management considerations is contained in the project file.

Table 3.2 displays the acres within each landform and the percent of the total project area represented by each of these landforms. Figure 3.2 shows the location of these landforms within the Swiftwater analysis area.

Nearly one third (about 30 percent) of the area consists of stream breaklands. These areas have very steep slopes and closely spaced streams. The erosion hazard on these landforms is high and sediment is delivered efficiently to streams. Soils on the south and west aspects are less productive, difficult to revegetate, and often there is plant competition with reforestation/ revegetation efforts.

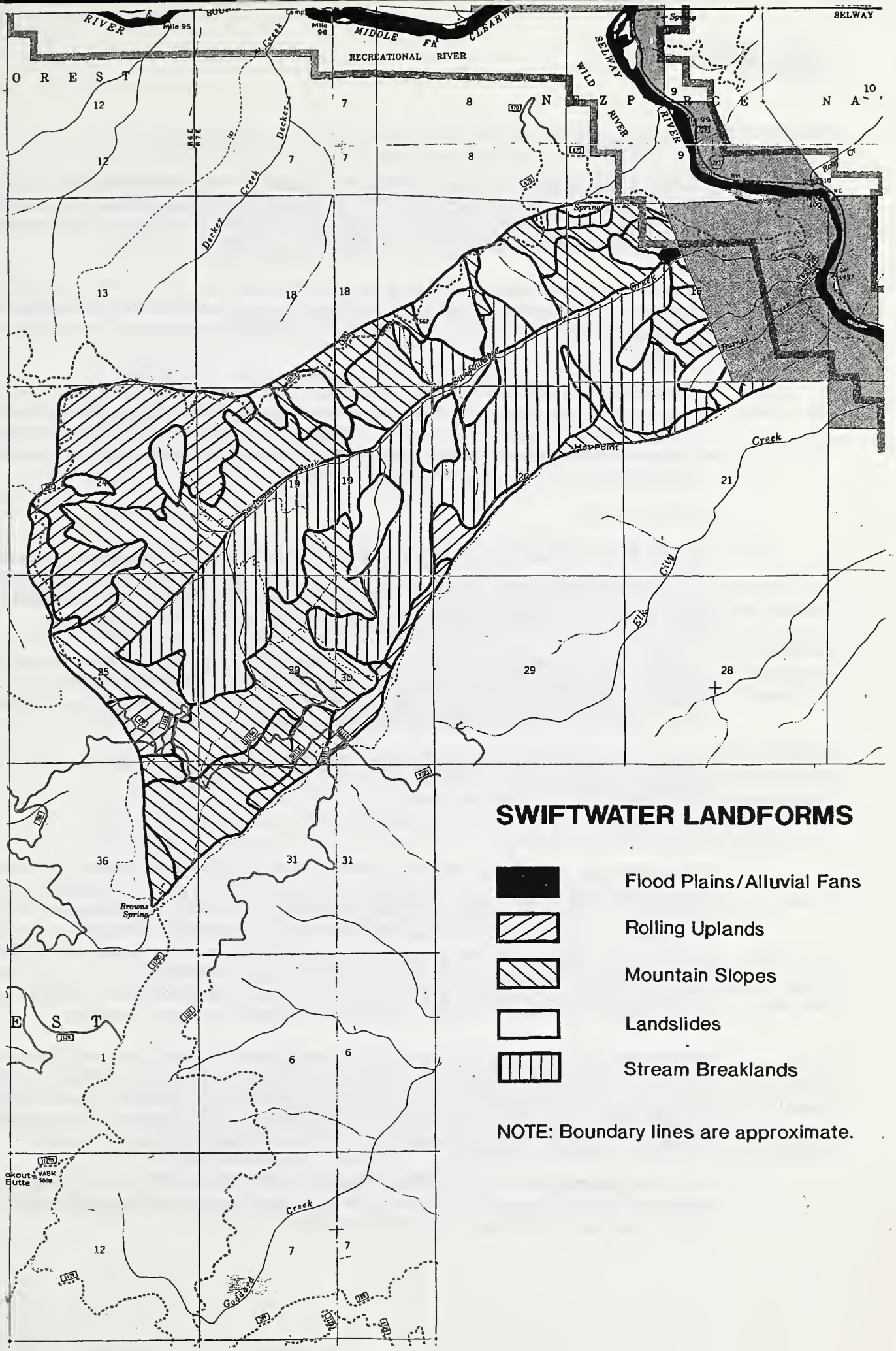
Just under 40 percent of the area consists of moist soils on moderate, 25 to 60 percent, slopes. The drainage pattern consists of dense patterns of parallel first order drainages. Seeps and springs are common on lower slopes. Material exposed by road cuts and fills tends to erode and ravel.

Approximately 12 percent of the area is on landslides in material derived from well weathered rocks. The drainage pattern consists of dense parallel or dendritic first and second order drainages. Final determination of the erosion hazard requires an on site evaluation by a geotechnical engineer. Road construction on these land types has the potential to cause landslides.

The remaining 16 percent of the area is on rolling uplands. These areas have gentle to moderate relief, 5 to 45 percent slopes, with dendritic drainage patterns. The erosion hazard from these areas is classified as low to moderate.

TABLE 3.2- DESCRIPTION OF SOILS WITHIN THE SWIFTWATER ANALYSIS AREA

LANDFORM	LANDTYPE	DISCUSSION	ACRES	% OF ALL ACRES
FLOOD PLAINS AND ALLUVIAL FANS	10AUU	Riparian areas; protection usually required; high sediment storage; low gradients.	32	<1
ROLLING UP-LANDS	22A41	Roads have high erosion hazards; moderate source of sediment.		
	24C41	Low erosion potential yarding systems; high potential roading; high potential sediment source.		
	24C8B	Wet soils, difficult to revegetate; unsurfaced roads erode, high erosion from roading, high sediment source		
	24C81	Limited moisture; revegetation problems	643	16
MOUNTAIN SLOPES	31C41	High erosion potential		
	31C8B	Wet soils, difficult to revegetate; high road erosion; high sediment source.		
	31D48	Plant competition; limited moisture for regeneration on southerly exposures; high road erosion and sediment source		
	31D8B	Riparian; wet soils; plant competition.		
	31D38	Moisture stress; solar insolation; moderate sediment source roading and yarding systems.		
	32A8B	Plant competition; infertile soils; high road erosion, moderate sediment source.	1538	38
LANDSLIDES	50CUU, 50EUU	Slope stability; high hazard soils.	514	13
STREAM BREAK-LANDS	60E48	Plant competition; high erosion potential from roading but moderate source.		
	61E38, 61E48	Poor regeneration southerly exposures; infertile soils; difficult to revegetate; high erosion potential; high sediment source.		
	61E22, 61E32	High erosion potential; moisture problems; high sediment source.	1313	32


SELWAY
RIVER
Mile 95
Mile 96
MIDDLE FK CLEARWATER
RECREATIONAL RIVER
SELWAY WILD RIVER
Decker Creek
Spring
Creek
Elk City
Browns Spring
Goddard
Lookout Butte VABM 5669
SWIFTWATER LANDFORMS
Flood Plains/Alluvial Fans
Rolling Uplands
Mountain Slopes
Landslides
Stream Breaklands
NOTE: Boundary lines are approximate.

2. Watershed

The analysis area is within the Swiftwater Creek Prescription Watershed, #17060302-01-24. The Swiftwater watershed is approximately 6.25 square miles (about 4000 acres). The elevation ranges between 1520 to 5200 feet. Average annual precipitation is 40 inches. The drainage is approximately 5.5 miles in length, and is a fourth order system.

The dominant climatic regime would be a snowmelt/summer stormflow. There is potential for regular rain on snow events in this zone. Over the past few seasons there has been at least one large stormflow event that has triggered mass movement of soils when associociated with road construction.

The established fisheries/water quality objective is 80% (Forest Plan Appendix A, p. A-3) of natural potential. The established sediment guidelines set by the Forest Plan allow base sediment rates to approach or equal 45 per cent overbase twice in a decade. Swiftwater Timber Sale which recently closed was the first entry this decade. The proposed action would be the second and final entry planned in this watershed this decade.

BENEFICIAL USES

The Idaho Water Quality Standards do not specifically designate beneficial uses in Swiftwater Creek. As an unclassified water, the designated beneficial use is primary contact recreation. However, the standards do provide for protection of existing beneficial uses. Therefore fish habitat is considered a beneficial use for all fish bearing streams in the analysis area.

In Swiftwater Creek, *the propagation of steelhead is an existing beneficial use*. Forest Plan Appendix A incorrectly states the primary beneficial uses as being for resident trout; the anadromous fisheries resource is the more significant beneficial use for fisheries. The established Fishery Water Quality Objective of 80% is correct.

Domestic water rights are another existing beneficial use. There are filed water rights on Swiftwater (Tudder, 1988).

WATER YIELD

Timber harvesting and road building can affect the timing and volume of water yield in areas where a significant portion of the precipitation falls as snow, such as in the Swiftwater watershed. Stand changes can alter the distribution of snow and the timing of its availability to the hydrologic cycle. Numerous authors have reported that in general water yields can be increased by cutting forest stands, and that the greater the annual precipitation, the greater the magnitude of annual water yield increase following the cutting activity. The percentage of a watershed subjected to treatment also affects the magnitude of water yield increases. In general, water yield increases are related to the percentage of a watershed cleared of vegetation.

Since the Nez Perce does not currently have a model that predicts water yield changes resulting from watershed management, a more simplistic approach is taken. Equivalent clearcut area is determined to develop the relationship between percentage of a watershed in clearcut status and anticipated water yields. This relationship is looked at to predict the liklihood of significant changes in water yield that might result in detrimental changes in watershed function.

Guidelines generally in use in the Northern Region have indicated that increases in water yield should not exceed one fourth to one third of an area being managed or detrimental effects on water quality, peak discharges and channel integrity may occur.

Four variables are looked at in calculating equivalent clearcut area. They are: area treated, the percent of the crown or canopy removed from a managed stand of timber, the habitat type and the number of years passed since the activity occurred. The dominant vegetation type within the Swiftwater drainage is western red cedar/grand fir. The watershed data base was queried to list all past management activities for stands. Roads were calculated as permanent openings/no recovery. The following table displays the current or existing condition in terms of percent of the watershed equivalent to clearcut.

TABLE 3.3 - EXISTING EQUIVALENT CLEARCUT AREA

EQUIVALENT HARVEST ACRES	ROADED ACRES	TOTAL ACRES	ACRES IN WATER-SHED	% EQUIVALENT CLEARCUT ACRES
307	75	382	3933	10

WATER QUALITY

Water quality data was taken in years 1975, 1977, 1978, 1979, 1989, 1991 and 1992.

Water temperature, stream flows, turbidity, conductivity, total alkalinity and suspended sediments were measured. Some of these data were collected continuously, and others were a series of spot samples. Generally the data show that Swiftwater Creek ranks as a system of relatively low productivity. For example, conductivity had a mean of about 45. A stream with high productivity could range between 200-400 micromho. Alkalinity was likewise low. Water temperature data revealed that stream temperatures were not limiting to fish. Although the means were good, suspended sediment showed some very high levels at times.

Watershed condition inventories have been completed for the area. The survey data are a part of the project file. These inventories located nonpoint source sediment sources and recommend action to stabilize these sites. The projects identified during these inventories would occur regardless of the decision made on this proposal as Forest Plan standards and guidelines call for scheduling watershed improvements in below objective watersheds (see chapter 4 for additional information).

A portion of the improvement work was completed in 1992; these projects were located within the past Swiftwater timber sale and were as follows:

* Reintroduction of large woody debris to an intermittant stream channel within Unit 2 (Stand No. 702-02-36) which had been harvested over, and prescribed burned. During a major rain event in May 1992, this channel was severely eroded. Mulching was also done.

* Planted ten riparian acres with conifer seedlings within Units 1 (Stand No. 702-02-35), 2 (Stand No. 702-02-36),4 (Stand No. 702-01-49), 5 (Stand Nos. 702-01-42 and 702-01-28), 6 (702-01-27 and 702-01-28) of old Swiftwater Timber Sale. This planting was in addition to the reforestation planting performed in 1990; and was specifically intended to reestablish rooting strength to stabilize the harvested riparian areas. Stocking rates exceeded general reforestation densities due to this.

* Seeded grasses and forbes along areas of Roads 470B, 470C and 470D which were exposed and eroding due to failure of earlier erosion control revegetation efforts.

Additional projects have been identified in the Swiftwater drainage that are needed for watershed improvement and probability of achieving an upward trend. These projects are identified in Chapter Four, Table 4.7.

3. Fisheries

Swiftwater Creek is a Class I stream. The headwaters of this creek begin on the east side of Pine Knob Peak (S30, T32, R6E) and courses for approximately 4,385 meters, flowing into the Selway River at river mile 3. It provides approximately 12,208 m^2 of steelhead (*Oncorhynchus mykiss*), rainbow trout (*O.mykiss*), and cutthroat trout (*O.clarkii*) habitat. Approximately 1 percent of the area of this stream is suitable for steelhead spawning (141.5 m^2).

Swiftwater Creek drains prescription watershed 17060302-01-24 and is approximately 4000 acres in size. Swiftwater Creek is a mid to low gradient stream located in a drainage composed of coarse textured soils with the dominant particle size being small boulders with cobble, coarse gravel and sand.

Historically, substantial populations of resident trout including westslope cutthroat trout (*Oncorhynchus clarkii lewisi*), rainbow trout (inland form), whitefish (*Prosopium williamsoni*), bull trout (*Oncorhynchus confluentus*), and anadromous salmonids, primarily steelhead trout and chinook salmon (*Oncorhynchus tshawytscha*) spawned and reared in the tributaries of the Clearwater River subbasin. Today the resident trout and returning runs of both steelhead and salmon into these tributaries have been reduced to very low levels. Swiftwater Creek has suitable habitat for all these species except chinook salmon.

Appendix A to the Forest Plan establishes fish/water quality objectives for all nonwilderness streams on the Forest; displayed as prescription watersheds. Sediment guidelines have been set for each watershed. These guidelines represent the maximum estimated increase in sediment over baseline (natural) conditions that can be approached or equalled and the maximum number of entries per decade that can generate these sediment levels. The fish/water quality objectives of individual streams are the lowest acceptable percentages of natural fish habitat potential that are to be attained as a result of management activities. Fish habitat conditions as they currently exist are shown below in Table 3.4.

TABLE 3.4- *SWIFTWATER CREEK HABITAT VARIABLE ANALYSIS TABLE*

Fish Species: **Steelhead, Cutthroat Trout**
Fish/Water Quality Objective: **80% of Potential**
Beneficial Use: **Anadromous**

Channel Type: **A&B**
Current Habitat Potential: **65% of Potential Condition**

Channel Type	Habitat Status	Cobble Embedded-ness	Pool to Riffle Ratio	Rearing Temp °C	Spawning Temp °C	Acting Debris (pcs per 100m)	Potential Debris (pcs per 100m)	Pool Quality Index	Instream Cover Index	Bank Cover Index	Bank Stability Index
A	Forest Plan Objective (or DFC) a/	25-29	40:60	16-17	13	40	60	3.0	3.0	3.0	3.0
A	Optimum Condition b/	<20	50:50	10-15	13	50-60	120	5.0	5.0	5.0	5.0
A	Existing Condition (from basin survey) c/	57	3:97	9	*4-12	18	23	3.0	4.7	5.0	1.8
A	Existing Condition as % of Optimum d/	20	34	100	100	30	20	60	100	100	70
B	Forest Plan Objective (or DFC) a/	30-34	40:60	16-17	13	40	80	3.0	3.0	3.0	3.0
B	Optimum Condition b/	<25	50:50	10-13	13	50-60	120	5.0	5.0	5.0	5.0
B	Existing Condition (from basin survey) c/	36	4:96	10	*4-12	14	19	3.4	4.5	4.9	1.8
B	Existing Condition as % of Optimum d/	70	36	100	100	30	20	80	100	100	70

a/ Forest Plan objective is expressed as lowest allowable fishery habitat condition that the stream may have as a result of management activities.

b/ A quantitative expression (measurement or rating) of the best possible condition of habitat variables (relative to fish production) for a given stream that can occur in time.

c/ A quantitative expression (measurement or rating) of the condition of the habitat variables measured during the actual stream surveys.

d/ Existing Condition as % of the optimum. A comparison of a stream to its optimum potential determining if a stream meets the Fish/Water Quality Objectives shown in Appendix A of the Forest Plan

Definitions of Habitat Components

The **existing condition** of the habitat is expressed as a percentage of optimum, undisturbed, condition for streams in the Clearwater/Lochsa drainages which are at optimum condition for all habitat components. This is related to the capability of the habitat to provide summer rearing, winter rearing, spawning habitat and riparian conditions that support fish production and channel integrity.

The **optimum conditions** of cobble embeddedness, summer rearing temperature, acting and potential debris pieces, pool quality, instream cover, bank cover, and bank stability was determined from the Desired Future Condition Tables (DFC's) (Espinosa, R. Stowell 1989).
* Data taken from hydrologic records from Swiftwater Creek (1975-1979), and from survey records from June 1989 and July 1991.

A basinwide stream survey using the Nez Perce Basinwide Stream Survey Methodology (Lanigan, 1989) was done to gather physical and biological information on this stream during mid-June 1989. The basinwide survey revealed a fishery composed of rainbow/steelhead and cutthroat trout throughout the fish habitable waters of Swiftwater Creek.

When inventoried during the summer of 1989 enough information was gathered to characterize the existing condition of the fish habitat and to identify changes which may occur with proposed activity in Swiftwater Creek. The survey method combined Rosgen's (1985) channel classification technique, Hankin and Reeves' (1988) basinwide stream survey method, and the Clearwater fish habitat relationships (Clearwater NF, 1988) survey methods. More detailed methodology and actual survey data are a part of the project file and are incorporated here by reference.

Survey data revealed a total of 248 square meters of resident spawning gravels and 217 square meters of anadromous spawning gravels. Gravels suitable for both steelhead and resident fish existed throughout the surveyed area, comprising approximately 3-4 percent of the area of the stream.

Stream temperature data was available from 1975, 1977, 1978, 1979, 1989, 1991 and 1992. Reading from 1975-1989 were spot readings taken once per day. Readings from 1991 and 1992 utilized Ryan temperature recorders and were set to record temperature hourly from the time they were installed instream to the day of removal. The interval of measurement ran from June to October/November. The temperatures recorded from these surveys revealed that stream temperatures were not limiting to fisheries capabilities.

Limiting factors identified were high cobble embeddedness (fine sediment), low pool to riffle ratios, and inadequate large organic debris. Sediment is far and away the most significant of these, heavily affecting winter rearing habitat and fish production in the Swiftwater area. Fine sediments are much more limiting in the upper reaches (A channel) than in the lower reaches (B channel) of this watershed.

HABITAT SCORES

The habitat scores for Swiftwater Creek represent the existing habitat production capability of the creek's fish habitat compared against the optimum potential for non-managed streams in the Selway River basin. The fish/water quality objective for this stream represents minimum level to which fish habitat will be managed in relation to the optimum habitat potential of the stream (Forest Plan Appendix A), this is referred to as the Desired Future Condition (DFC) for the stream.

The DFC's displayed in **Table A-1 Forest Fishery/Water Quality Objectives by Prescription Watershed** of the Forest Plan are based on projections of optimum stream habitat conditions that could be found in the Clearwater/Lochsa drainages.

The physical characteristics of streams and their associated biota change from headwaters to downstream areas. More accurate stream condition summaries can be obtained by sectioning the stream according to channel "types". The habitat components of Swiftwater Creek were calculated for two channel types as described by Rosgen. The criteria used to classify these two channel types is as follows:

Type A: Channel forms are generally contained w n narrow valley bottoms with sideslopes often over 50%. Stream gradients are normally g er than 4%. Streambeds are often characterized by bedrock, large rubble, and boulders.

Type B: Adjacent slopes generally range from 0 to 50%. Stream gradients vary between 1.5 and 4%. Streambeds are often characterized by small to large boulders, small to large rubble, and coarse gravel.

The majority of the length (2,523 meters/81%) of mainstem Swiftwater Creek is classifed an A3 channel type and is characterized by mixed substrates with greater than a 4% gradient.The lower 19% (610 meters) of mainstem of Swiftwater Creek is classified a B2 channel type and is characterized by a larger substrates and a relatively gentle (1.5-2.5%) gradient.

Swiftwater Creek was surveyed for the Idaho Dept. of Fish and Game by Murphy and Metzger (1962). They reported difficult fish passage into the system. They estimated areas as suitable for steelhead spawning to occupy approximately 1 percent of the stream area. This varies from the U.S. Forest Service estimates from the 1989 basinwide survey where estimates of suitable spawing habitat were 3-4 percent of the stream area. Murphy and Metzger did not recommend improving passage into this stream, as they felt the stream was not productive enough to warrant the cost. However, passage was improved through replacement of the existing culvert crossing at the confluence of Swiftwater Creek with the Selway River, with an 8 foot open concrete arch. There is ample spawning gravels available to provide full seeding given adequate escapement.

TABLE 3.5- FISH HABITAT COMPONENT RATING TABLE

	Habitat Classifications			
Channel Type	Summer rearing 1/	Winter Rearing 2/	Spawning 3/	Riparian Condition 4/
A=81% Stream's Length	100-34-100-80 79%	20-34-80 45%	20-100-100-80 75%	20-30-100-70 55%
B=19% Stream's Length	100-36-100-80 79%	70-36-80 62%	70-100-100-80 88%	20-30-100-70 55%
Weighted Average	79%	49%	77%	55%

1/ Reported as a percentage of the optimum and derived from averaging instream cover, pool/riffle ratio, maximum summer water temp., and pool quality.

2/ Reported as a percentage of the optimum and derived from averaging cobble embeddedness, pool/riffle ratio and pool quality.

3/ Reported as a percentage of the optimum and derived from averaging cobble embeddedness, instream cover, maximum summer water temp. and pool quality.

4/ Reported as a percentage of the optimum and derived from averaging potential debris, acting debris, bank cover, and bank stability.

DISCUSSION OF FISH HABITAT COMPONENTS

Although current habitat potential is displayed in Table 3.3 as 65 percent, this is a figure derived from an average weighted by channel type and habitat classification. This is for relative comparison purposes only, as averaging the values for the habitat components tends to hide the

factor(s) which are most biologiclly limiting and may best represent what is occurring in the stream. The reader must look closely at the Table 3.4 (*Habitat Variable Analysis Table*) and Table 3.5 (*Habitat Component Rating Table*).

While only 19% of the stream channel is classified as B channel type, this reach likely accounts for most of the current fish production in Swiftwater Creek. Although available spawning gravels are relatively well distributed throughout both the A and B channel portions of Swiftwater Creek, the gradient in the A channel portion (>4%) and the degree of cobble embeddedness (57%) limits both spawning and rearing. The snorkel surveys showed fish densities were much better in the B channel portion of Swiftwater Creek. The lower cobble embeddedness values in the B channel reach over the A channel portions is reflected in the higher ratings for both winter rearing and spawning habitat.

It can be seen that **summer rearing** habitat for both A and B channels is very near Forest Plan objectives. Only pool/riffle ratios are keeping summer rearing values low. These lowered pool numbers are more due to lack of woody debris (pool creators) than sedimentation and loss of existing pools. This is the result of natural fluctuations, and have not been induced by past management activities. There has been no significant harvest of streamside timber along fish bearing protions of Swiftwater Creek.

Winter rearing habitat has the lowest rating and is the most limiting habitat element. This is due to cobble embeddedness and is much more pronounced in the A channel reaches. Cobble embeddedness values were measured at a significantly lower level in the B channel portion (36 percent versus 57 percent for the A channel section) of Swiftwater Creek. Much sediment is being stored in the upstream (Class II) headwater portions of this stream, as well as in the A channel reaches. Its values are very near Forest Plan standards (80 percent) at (70 percent) for the B channel reach. It is the low number of pools which is keeping winter rearing below objective in the B channel reach. AS mentioned for summer rearing, this is not due to past management activities. Sediment is heavily affecting winter rearing values in the A channel reaches, and is likely due to past road construction in the drainage. There is a fair amount of natural sediment production occurring along the stream form failing banks, but this alone would not account for the high cobble embeddedness levels. Winter rearing when combined for the whole stream is the most limitig habitat component.

Spawning habitat is very near Forest Plan objectives, but emergence success may be well below desired levels within the A channel reaches due to the heavy sediment load.

Riparian habitat is below objective due to the lack of large acting and potential woody debris. This again is due to natural fluctuations in the availability of wood, and is not due to past harvest in or near the streamside. The riparian areas of this stream have not been affected by harvest activities except along the bottom of Unit 5 in the last Swiftwater Timber Sale where cutting and burning have removed riparian timber. Overall, this small area will not affect the progressive upward trend in large woody debris and the subsequent increases in pool/riffle ratios as this wood begins to be added to the stream channel. Recent timber harvest activities have largely stayed out of the riparian areas, so these values should be progressing upward at this time.

The B channel portion of this stream represents most of the productive potential for Swiftwater Creek, and is more representative of its potential fish production. This portion of Swiftwater Creek is much closer to the Forest Plan objective as dispalyed in Table 3.4.

FISH POPULATIONS

Habitat type and fish density information obtained from field surveys is displayed in Table 3.6.

TABLE 3.6- FISH DENSITIES vs. HABITAT TYPE (B CHANNEL TYPE-REACH 1)

HABITAT TYPE	TOTAL HABITAT AREA (m^2)	% TOTAL HABITAT AREA	TROUT (#/100m^2)	STEELHEAD/ RAINBOW (#/100m^2)	STEELHEAD/ RAINBOW (#/100m^2)	CUT-THROAT (#/100m^2)	CUT-THROAT (#/100m^2)
			Age 0	Age 1+	Age 2+	Catch	Trophy
Pools	105	3.8	5.9	3.0	1.5	3.0	0
Riffles	2518	91.6	3.9	1.5	0	0	0.6
Glides	0	0	0	0	0	0	0
Side Channels	126	4.6	4.0	0.8	0	0.8	0
All habitats	2748	100	4.2	1.5	0.2	0.6	0.4

TABLE 3.7- FISH DENSITIES vs. HABITAT TYPE (A CHANNEL TYPE-REACH 2)

HABITAT TYPE	SAMPLED HABITAT AREA (m^2)	% SAMPLED HABITAT AREA	TROUT (#/100m^2)	STEELHEAD/ RAINBOW (#/100m^2)	STEELHEAD/ RAINBOW (#/100m^2)	CUT-THROAT (#/100m^2)	CUT-THROAT (#/100m^2)
			Age 0	Age 1+	Age 2+	Catch	Trophy
Pools	185	3.7	6.1	2.0	1.0	2.0	1.0
Riffles	4642	94.1	1.8	0.5	0.2	0.5	0.4
Glides	0	0	0	0	0	0	0
Side Channels	107	2.2	5.6	0.9	0	0	0
All habitats	4934	100	2.3	0.6	0.2	0.5	0.4

TABLE 3.8- FISH DENSITIES vs. HABITAT TYPE (A CHANNEL TYPE-REACH 3)

HABITAT TYPE	SAMPLED HABITAT AREA (m^2)	% SAMPLED HABITAT AREA	TROUT (#/100m^2)	STEELHEAD/ RAINBOW (#/100m^2)	STEELHEAD/ RAINBOW (#/100m^2)	CUT-THROAT (#/100m^2)	CUT-THROAT (#/100m^2)
			Age 0	Age 1+	Age 2+	Catch	Trophy
Pools	76	1.7	12.1	15.1	3.0	3.0	3.0
Riffles	4371	96.6	0.8	0.2	0	0.3	0.1
Glides	27	0.6	0	0	0	0	0
Side Channels	52	1.1	7.7	0	0	0	0
All habitats	4526	100	1.2	0.4	0.1	0.3	0.1

Combined fish densities for A and B channel types and averages weighted by habitat type are displayed in Tables 3.6 to 3.8.

Fish densities for all species were naturally highest within pool habitats. After combining channel types and weighting numbers to account for the percent of stream within the various habitat types, it can be seen that fish densities for Swiftwater Creek are low when measured against the DFC values and more productive systems across the Region.

Streams on the Clearwater and Nez Perce National Forests supporting good numbers of age zero rainbow/steelhead could run as high as 40-100 fish/100 square meters in pool habitat in the better streams, with a more common range being 40-60 fish/100 square meters (pers. comm. A. Espinosa). From the tables above it can be seen that even when combining all species under age 0 fish densities range from 3.8 to 12.1 fish/100m^2. If Swiftwater Creek was at, or above, the desired objective (80 to 100 percent) the age 0 rainbow/steelhead densities should range between 32 to 60 fish/100 square meters.

Good rainbow/steelhead numbers for age 1+ fish for streams in this area are usually seen when numbers approach 20-30 fish/100 square meters (pers. comm. A. Espinosa). Current densities for age 1+ and 2+ rainbow/steelhead in Swiftwater Creek range from 1.0 to 15.1 fish/100m^2 with the average being more near 1.8 fish/100m^2. If Swiftwater Creek was at, or above, the DFC objective (80 to 100 percent), age 1+ should be within a range of 16 to 30 fish/100 square meters. The highest fish densities were recorded for pool habitats in the extreme upper reaches of the watershed where there was no other suitable rearing available other than the pools.

Within anadromous dominated systems cutthroat trout densities in age 1+ fish might be expected to run about 1-5 fish/100 square meters. Swiftwater Creek, while not a productive cutthroat system, does have fish numbers near the expected range.

In speaking with local residents who have resided in the area for the past 40 years and longer, it was discovered that steelhead have historically used Swiftwater Creek. Some spoke of taking adult steelhead just off the mouth of this stream in the Selway River during the spring spawning migration. The presence of suitable gravels for anadromous fish and snorkel counts of rainbow/steelhead, along with historical accounts leave no room for doubt that this is an anadromous stream.

The culvert at the mouth of the stream was replaced in 1987 with one featuring an open-bottom to facilitate passage by returning adult steelhead (contrary to recommendations of Murphy and Metzger). Fish passage through most of the spawning season remains rigorous except during peak river flows. Low flow passage is hampered by development of an alluvial fan at the outlet of Swiftwater Creek. This site should be monitored overtime to see if conditions change. Poor escapement to the Clearwater Basin of wild B-run steelhead is further keeping steelhead numbers in Swiftwater Creek low. Fish population in Swiftwater Creek would be characterized as poor.

Temperature recordings from the past two years show that Swiftwater Creek obtained its highest readings in the last half of June. Daily high and low temperatures were graphed. Threshold temperatures for spawning and rearing are within the desired life history ranges for bull trout, rainbow/steelhead and cutthroat. The exception to this could occur in late June if there was delayed spawning by trout. Generally this is recognized as being the latest possible dates for spawning, and most spawning would be occurring before this time.

LIMITING FACTORS

Comparison of the existing condition as a percentage of the optimum for both "A" and "B" channels shows the factors limiting fish production in Swiftwater Creek to be low pool to riffle ratio, inadequate large organic debris and high cobble embeddedness. The most significant of these would be cobble embeddedness.

The Nez Perce Basinwide Survey Methodology used in the 1989 survey of Swiftwater Creek did not record pocketwater as a separate pool category as is done today. Pocketwater is habitat identified by areas of the stream flowing around or through protruding stream channel substrate (rubble or boulders) or obstructions such as logs. Pocketwater is characterized by 6"-12" pools with surface agitation around the rocks creating microniches with charactristics of riffles, pools and runs at varying flow levels. They are productive habitat for steelhead. Much of the habitat classified as riffle within the Swiftwater survey was actually pocketwater, and would be recorded as a separate pool habitat unit under todays protocols. As a result, pool riffle ratios while not up to DFC levels, are understated for this stream. This has resulted in existing condition estimates for summer and winter rearing which are likely lower than actual since pool/riffle ratios are understated. When one examines Table 3.4 under winter and summer rearing (in B channel), it can be seen that it is the value for pool/riffle ratio which is keeping the rating low.

Although sediment deposition can account for loss of pool habitat, it is believed that it is the lack of pool creators (lack of large diameter acting woody debris) within the channels that is the primary reason for the low numbers of pools.

Since the last big fires swept this area approximately 70-80 years ago, Swiftwater Creek has been been recovering its fish productive capabilities. This area is only now beginning to recruit large woody debris from the last stand replacing fire. Past management activities have not reduced large woody debris recruitment to fish bearing portions of Swiftwater Creek significantly, except for a small reach on private lands near the stream mouth and a small section along the bottom of one harvest unit. Pool/riffle ratios should continue to improve with time.

Land management activities have degraded water quality through sediment deposition, but have not likely affected the recovery of the other elements critical to fish habitat. Past harvest levels were not at levels which could be expected to have caused increases in water yield sufficient to have caused morphological changes in Swiftwater Creek. Stream temperatures have not been adversely affected by past activities and are not currently limiting.

With all habitat components except sediment, it is believed there has been a continuous upward trend in place for some time. Land management activities and natural events have not have resulted in temporary reductions or downturns in the natural rate of improvement. Since the last major fire event all habitat components except sediment are thought to have been on an upward trend.

Sediment inputs from past activities and natural erosion have combined to create a situation where an upward trend will require both mitigation for new proposed actions to assure that the sediment guidelines are not too closely approached, and identifying and stabilizing existing non point sediment sources within the watershed. Future activities should be contingent upon both occurring within the same near timeframes.

Land management activites (road construction and harvest) have likely reduced fish populations in Swiftwater Creek. However, low escapement to the Clearwater sytem has probably been as significant a factor in reducing fish numbers in Swiftwater Creek, given the relatively good condition of the lower B channel reach.

One should not discount the importance of the fish in Swiftwater Creek, especially steelhead. The Selway River steelhead are being managed by the Idaho Department of Fish and Game (IDF&G) to maintain the genetic integrity and diversity of wild, native steelhead. Steelhead populations have not been supplemented in the Selway drainage. It is one of three drainages in Idaho that support wild B-run steelhead. Preservation of this wild, native gene pool is a priority as the Selway will continue to be managed for wild fish. The desired outcome is to rebuild this important population. The IDF&G estimated parr densities at 13 percent of carrying capacity for years 1985-1989 in the Selway basin. Swiftwater Creek is contributing to these low levels. Natural production alone is being relied upon to sustain existing wild populations. At this time there is no open fishing or take allowed on steelhead in this system on steelhead. Natural straying rates and variation in year classes provide important genetic contributions.

Management activities must take into account the significance of the Swiftwater steelhead population to the overall recovery of wild steelhead in the Selway River, and not result in detrimental changes in habitat or capability. Actions should guarantee recovery from high sediment levels.

D. Biological Diversity, Fragmentation and Ecosystem Management

Biological diversity or biodiversity refers to the variety, abundance, and distribution of living organisms and the processes through which they interact (Norse et al., 1986). Biodiversity encompasses the interrelationship between all facets of the natural world.

The issue of biological diversity, (including fragmentation and old growth) is extremely complex. A useful framework for discussing, analyzing and monitoring biological diversity has been described by Noss (1990). In his article, diversity is characterized as having three types: **compositional**: the variation in kinds of things present; **structural**: the variation in the physical attributes (shape, size, pattern) of things present; and **functional**: the variation in processes or functional roles present. Each of these **types** of diversity are described at four **levels** of resolution: **genetic, population/species, community/ecosystem** and **regional landscape.** Thus, a comprehensive discussion of diversity could potentially address 12 separate categories.

Noss's framework is used in this discussion of biological diversity. Greater emphasis is placed on diversity at the community and landscape levels, because there is little data available on local species/population or genetic diversity (except for Sensitive and Management Indicator species) and likely effects of management activities are poorly understood.

Current literature emphasizes that managing for diversity requires a regional perspective. Information to study biodiversity on the regional level is still being developed. Mapping in this effort places the Swiftwater analysis area within the Northern Rockies Province. This Province is the portion of the Rocky Mountain range that runs through Idaho, western Montana, and northeastern Washington characterized by high rugged mountains and flat valleys. Within this Province, the area of the Selway River and its tributaries is more closely defined by the parent rock, mainly Idaho Batholith of granitic and border zone gneiss and schist origin. These parent materials affected by erosional forces such as glaciation and water flow have resulted in the Selway having steep, rugged mountains with relatively narrow, deeply incised drainages. It seems to be missing the flat valleys that are more representative farther north, south and east.

During glacial stages within the last 100,000 years, large ice sheets have slowly accumulated in high latitudes. It is estimated that these glacial stages end with a rapid decay of the ice sheets, followed by relatively warm interglacial periods of 10-20,000 years, similar to the current

Holocene Epoch. We may be within a few thousand years of the next glacial period (Schoonmaker, et al, 1991).

While the Province is catogorized in the continental climatic zone, the local occurance of Maritime climate within the Selway and Lochsa valleys has been a major influence on landforms and vegetation since the last ice age, about 10,000 years ago.The result on local conditions are moderate climatic seasons with periodic moisture throughout the year, and growing conditions very similar to the Pacific coast. The Selway and Lochsa river valleys are considered to be a disjunct of the biotic communities found on the coast.

Native vegetation would be considered in the Hemlock/Cedar/Grand fir zone and would fit Leiberg's historic White Pine Ecosystem. The vegetation also fits Wellner's Western White Pine and Associated Species, and has been maintained over the centuries in even-aged stands by periodic wildfires. The animal communities that depend on these vegetative habitats are discussed later in this section. The aquatic habitats and their dependent species were discussed earlier in this chapter.

FIRE DISTURBANCE AND STAND DIVERSITY

The occurence of fire on the landscape has been a dominant influence on the evolution of the ecosystems on the Nez Perce Forest. Arno and Barrett's work (1988, 1991) in the Selway Bitterroot Wilderness suggests that about 78% of the landscapes in this area burned primarily as stand replacing fires, with fire intervals between 100 and 200 years in a given stand. The table below shows the timing and severity of fires on the three vegetative cover types that are represented on the analysis area.

TABLE 3.9 - FIRE REGIMES IN THE SELWAY AREA

COVER TYPE	ASPECT	MEAN FIRE INTERVAL	MEAN ACERAGE BURNED
Ponderosa Pine/Douglas-fir	S to SW (Warm)	23 Years	17,000
Douglas-fir/Grand Fir	N to E (Cool)	119 Years (Stand Replacement)	1,100
Western Redcedar	N to W (Cool)	197 Years (Stand Replacement)	200

About 120 years ago, something killed most of the conifers on the analysis area. Based on the species that are there now and what we know about their requirements for establishment and growth, and the presence of wood charcoal in the upper levels of the soil horizons, this was a massive wildfire that burned over most of the analysis area. It left in its wake mostly dead or severely damaged ponderosa pine, Douglas fir, grand fir, western redcedar, Englemann spruce, lodgepole pine, western larch and western white pine. Several of these species are very tolerant of fire damage because they have evolved with thick bark on mature trees that tends to insulate their vital tissues from wildfire heat. These fire-tolerant species are ponderosa pine, larch and Douglas-fir. The other species are fairly easily killed by wildfires because of thin bark or needle sensitivity to scorch. Remnant old ponderosa pine, Douglas-fir and Larch can be found in isolated patches or individual trees throughout the analysis area. Remnant old cedar and spruce can be found in some of the wet draw bottoms and riparian areas, amounting to about

20% of the area. Their survival was not based on fire tolerance as much as it was because of the wet sites where they survived would not burn, even during extreme fire weather.

The remainder of the conifers died as a direct result of this fire. They began regenerating almost immediately, either from seed remaining in the soil and unburned duff, or from seed fall from nearby dying trees. This resulted over time in a forest of trees that were all within a few years of the same age, except for the scattered legacies that survived the fire.

A second fire followed this one, about 30 years later, probably fueled by down material that died during the first fire. It was not as intense nor as widespread, and resulted in only portions of the regenerating forest being killed. The openings provided an avenue for the abundant seed to sprout and rapidly fill in with another age class of the same species, mainly grand fir and Doug fir. There is not a reliable means of expressing the actual acreage of these two storied stands. They are intermingled with both the single-storied 120 year old stands and the older cedar/ spruce stands.

The vegetation occupying this landscape has succeeded over time within this disturbance regime, and could be considered dependant upon this type of disturbance for its success as a resilient forest type (Hann, W.J., *Management for Landscape and Ecosystem Biodiversity*, 1991, page 2). Due to the mild temperatures and the abundant precipitation on this landscape, these conifers are able to attain close to their maximum growth potential when on the deep granitic soils present on the majority of the sites here.

Fire suppression efforts over the last 50 years have limited the spread of ignitions on the analysis area. As the forest continues to grow older, indigenous insects and disease begin to affect more individuals within the forested ecosystem, changing it from a young, fast-growing stand to a mature stand where dead and dying trees become more apparent. Fuels in the form of these dead trees and litter on the ground are accumulating faster than they are decaying. This may continue to a point where spread of an ignition cannot be checked, even with the utilization of the most modern fire suppression techniques. Armellaria root disease is responsible for a marked increase in the rate at which this woody debris is accumulating.

The patterns on this landscape associated with these forces can be described as an even-aged forest in two age classes, 60-80 years old and 100-120 years old, covering 65% of the area. Old growth relics, primarily Doug fir and Ponderosa pine are scattered thoughout the dryer sites of these large, even-aged stands. Root rot infection is obvious in most of these stands, resulting in small openings being naturally regenerated to grand fir and Doug Fir. Scattered stands of 200-400 year old cedar occur primarily in the wet draw bottoms, and old grand fir and minor other species occupy the areas of saturated soils called Grand Fir Mosaic near the ridgetops.

Another pattern can be seen overlaid on this broad pattern. There are stands generally smaller than 50 acres, of several ages, that are due to both small lightning fires and root rot infections. Most of these show varying levels of the rapid herbaceous, shrub, and conifer growth that is common on these sites within the first 20-30 years following disturbance. These patches are scattered randomly across the 60-120 year old type described above, and tend to mottle the more even appearance of undisturbed portions of these larger patterns.

2. Previous Harvest, Age Class Distribution and Fragmentation

Timber management activities began in this area in the late 1950's. Clearcutting and salvage/ sanitation cutting were the primary harvest methods used, but a few stands were also partially cut utilizing selection harvest, commercial thinning, and overstory removal methods. Yarding was by skidders and dozers during this early era, and was concentrated on the mild slopes near

ridge tops, in stands that were 110-250 years old. This practice lead to large (200-1200 acre) areas in early successional stages. Very little of these large openings actually occur on the analysis area, but are immediately adjacent to it in the Lodge Point and Browns Springs drainages. Subsequent harvest has occurred on the steeper slopes in the Swiftwater area that has been primarily cable yarded. Because of the physical limitations of a cable system, harvest units tend to have straight edges and very few leave trees survive the harvest or subsequent fuel treatment activities. In most cases, burning of slash would tend to eliminate more of the down fuels on these steep areas than a wildfire would on the same area.

Most of the past harvest units have been certified as adequately restocked, which is 300 to 450 trees per acre. An exception is the plantation failure of all seven units of the Swiftwater Timber Sale, planted in the fall of 1991. Failure on these 155 acres of planting was due to a combination of droughty conditions and an unexpected hard frost, resulting in restocking success between 30 and 60%. The acceptable standards for success on these sites at the first year survey is between 85 and 100%. These units are scheduled for replanting in the spring of 1994. A restocking failure on the general area in and around Swiftwater Creek is fairly uncommon, the last occurring on several harvest units in 1981. The artificial regeneration described above tends to introduce more species of conifers on a given site than would naturally occur. Douglas fir and grand fir would predominate after a stand replacing fire if ponderosa pine, white pine, western larch, Englmann spruce, and lodgepole pine were not introduced during reforestation activities.

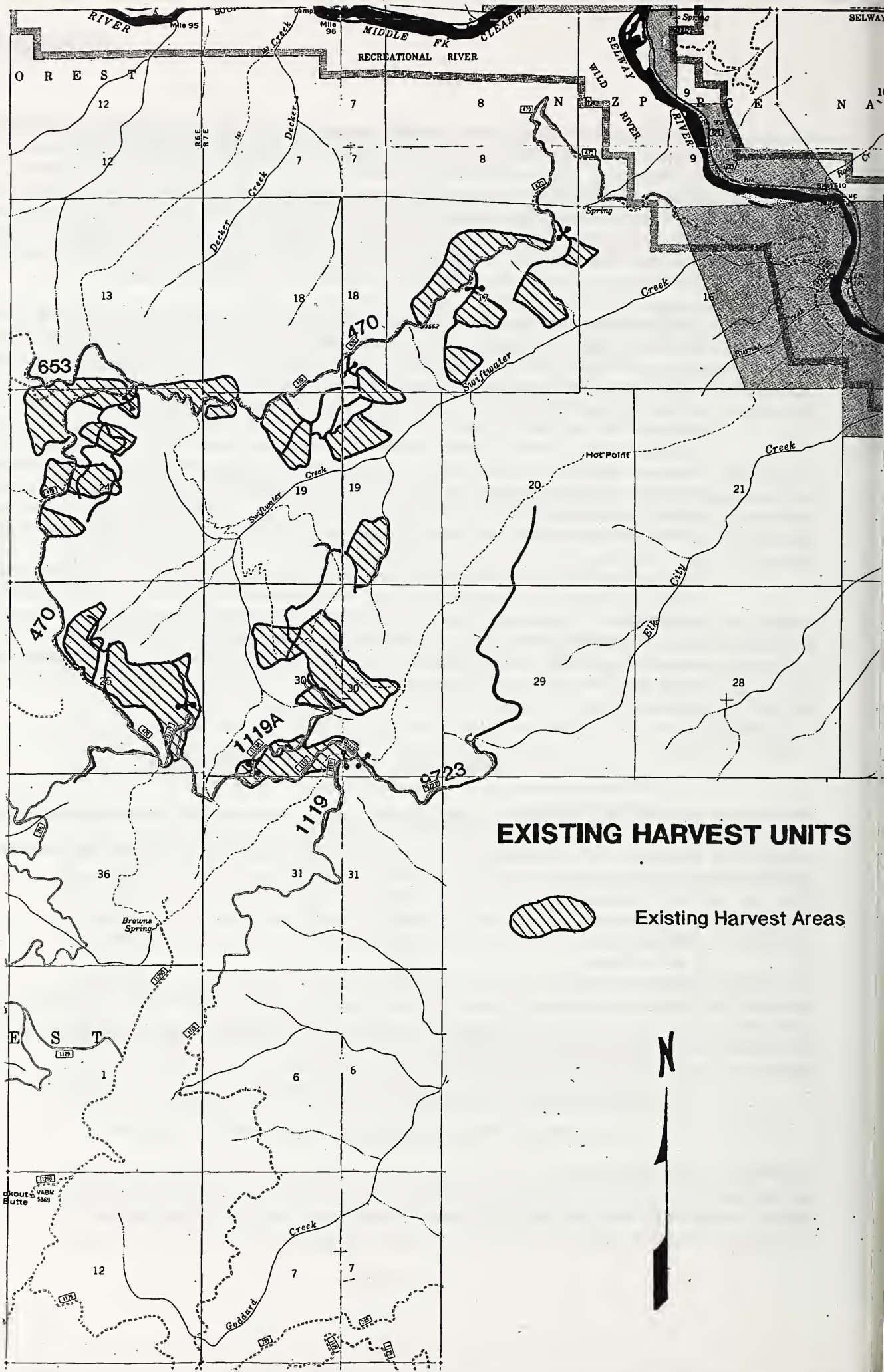
Previous harvest and fire occurrance have broken up the vegetative component on this landscape. The result is a mosaic of age and size classes that show distinct differences in plant composition, depending on the site where they occur and their age. Logging, while not analogous to natural fire, has created similar early successional stages of vegetation on continuous areas of up to 1200 acres within or adjacent to the analysis area. The logged areas generally have fewer standing and down dead trees than areas that have regenerated following stand replacing fires.

TABLE 3.10- AGE CLASS DISTRIBUTION

AVERAGE STAND AGE	ACRES IN STAND	PERCENT OF ANALYSIS AREA
20 years or less	391	10%
20-40 years	456	11%
40-60 years	20*	1/2%
60-80 years	1050*	26%
80-100 years	1517*	38%
Older than 100**	600*	15%

* Stand acres are estimated based on known fire history and age measurements taken during stand examinations.

** These stands show measured ages of 100 to over 300 years.



EXISTING HARVEST UNITS

Existing Harvest Areas

N

3. Timber Harvest and Vegetative Succession

Habitat types reflect the probable vegetative condition that would be self-sustaining barring a disturbance such as wildfire. The habitat types represented by these stands vary from warm/dry Doug fir types to cool/moist Subalpine fir types (Forest habitat types of Northern Idaho, Cooper, et al). Both extremes of this climatic continuum are poorly represented on the analysis area, with the vast majority of sites reflecting either a grand fir or cedar habitat type. Vegetative productivity on these habitat types is very high, resulting in rapid recolonization of disturbed sites by many species of herbs, shrubs, and trees. This potential productivity also results in the rapid change of vegetation over time because competition is fierce for light and moisture. As conifer crowns begin to merge with each other, the light and moisture availability declines, resulting in few individuals and fewer species occupying the forest floor. A steady decline of vegetative diversity is apparent. Structural diversity may increase as this forest attains its self-sustaining climax, as defined by the habitat type. The lack of light on the forest floor will result in almost no herbaceous or shrub population except in small openings caused by tree fall. The conifer canopy will be made up of only one or two shade-tolerant species.

Vegetative climax does not generally occur. There are too many climatic and pathogenic factors at work on a maturing forest that interupt the march toward it. Trees get diseases and rot, or are blown down during a wind storm. Their fall creates openings in the canopy that allow increased light and moisture to reach the forest floor. The rapid recolonization by herbs, shrubs and regenerating trees is the same process that happens in larger openings created by timber harvest.

4. Coniferous Old-Growth Forest

Candidate stands exhibiting suitable old growth coniferous forest characteristics were selected during the integrated resource analysis. Characteristics used included: 1) minimum 100 ft^2 basal area/acre of large trees (>20" dbh); 2) minimum age of oldest trees in stand 150 years; 3) some decadence attributable to stem rot. The 100 ft^2 basal area was ignored when a stand displayed: 1) typical grand fir mosaic attributes (a few, scattered old grand fir interspersed with boggy areas and alder glades); 2) the stand was desirable for connecting old growth stands or riparian zones.

Candidate stands selected for replacement old growth had: 1) minimum 200 ft^2 of basal area/acre in the 9-18" size classes; 2) 2500, or greater board feet per acre of timber volume; and 3) some indication that decadence was likely to progress as the stand aged.

During field season 1992, all designated candidate old growth management areas (MA 20) and identified potential timber harvest units in the Swiftwater Analysis Area were surveyed for old growth forest characteristics. The survey was done to assess the old growth characteristics of the surveyed area with the typical old characteristics for the habitat type(s) expected on that site. The North Idaho Zone Old Growth descriptions developed by the North Idaho Zone Old Growth Committee were used for this effort (copy available in project file). Results were synthesized for the MA 20 and potential timber harvest areas (separately and collectively). Based on the survey results and the desire to identify the best old growth stands in the study area, only those stands expressing the following were determined to best fit the desriptions of coniferous old growth forest (for this area and habitat types):

Classified Old Growth

* Optimum old growth forest characteristics present in at least three or more attributes; and,

* Marginal old growth forest characteristics present in all remaining attributes.

Classified Replacement Old Growth

* Optimum old growth forest characteristics present only in one or two attributes; or,

* Marginal old growth forest characteristics present in all remaining attributes.

Candidate stands in the analysis area are limited due to the history of wildfires and timber harvest. The best candidate stands were selected based on the above classification criteria. Juxtaposition, distribution, ecologic diversity and connectivity criteria were considered for final selection of both old growth and replacement old growth stands. No surveyed stands or areas contained more than four optimum old growth attributes identified for the North Idaho Zone. Surveyed stands which not possess any optimum old growth attributes and lacked marginal characteristics in one or more of the attributes were discarded from consideration for imminent designation as MA 20.

Exceptions to minimum characteristics were applied when individual stands would maintain a large block of old growth or replacement old growth, but did not meet the minimum requirements at this time. These criteria were identified to: (1) conform with direction for identifying old growth stands (age and structure) and (2) conform to stand tabulation printouts. In addition stands consisting of less than 25 acres were included only if they were part of a 50+ acre block of contiguous old growth.

For the purposes of final selection and achieving forest plan direction, candidate old growth stands in Management Area 8 were not considered. Stands within this MA will be managed as **defacto** old growth due to the fact that timber harvest and other vegetative manipulation are precluded (except to manage visual quality and the river corridor). Although unable to manage these stands as old growth, a major percentage of the stands possessing the best old growth characteristics occur in MA 8.

Validation of 436 acres of old growth (213 acres replacement and 223 existing) was conducted during the 1992 field season. The tables on the following pages depict the results of the old growth survey. "Scores" were calculated on a scale of 1 to 10 where 1 would be indicate little or no old growth characteristics and 10 would indicate that a stand was currently old growth with those character istics mentioned above.

TABLE 3.11 - EVALUATION OF DESIGNATED (MA 20) OLD GROWTH STANDS

SURVEY UNIT #	ACRES	SCORE	OLD GROWTH ATTRIBUTES	OLD GROWTH VALUE	COMMENTS
MA 20 #1	185	8	Large Dead Wood, Canopy Structure	Replacement Old Growth	Stand lacks large tree age (est 75 yr old). Area adjoins State lands; retains connecting corridor with Elk City watershed and lower elevation along the Selway River
MA 20 #2	28	9	Decadence, 2+ Canopy Levels & Misc	Replacement Old Growth	This area is part of riparian and replacement old growth complex (MA 20 #2) and connecting corridor between Switwater and Decker watersheds
MA 20 #8	53	10	Large Tree Age, Canopy Closure & Misc	Old Growth	Provides a portion of the connecting corridor of old growth stands (along with MA 10 areas) between Swiftwater and Lodge Creek watersheds.
MA 20 #11	167	10	Large Tree Age, Canopy Closure and Large Dead Wood	Old Growth	Provides a portion of the connecting corridor of old growth stands between Swiftwater and Clear Creek watersheds.

The identified and designated stands of Management Area 20 are shown on the next page in Figure 3.4. These stands are not "islands" within the Upper Swiftwater analysis area. These stands connect to other stands of MA 20 to the north and west which are part of the Middle Fork analysis area.

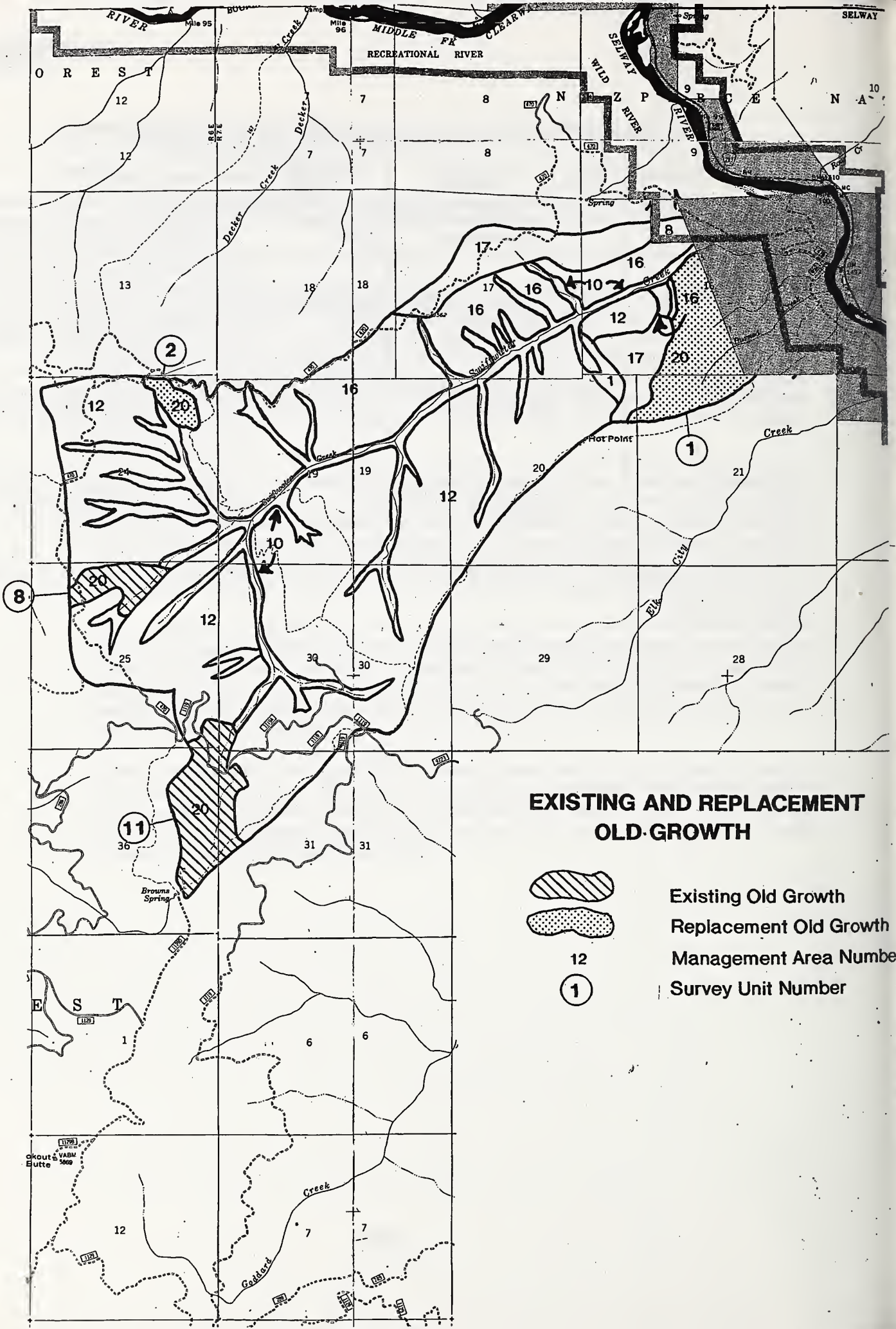

MIDDLE FK CLEARW
RECREATIONAL RIVER
SELWAY
WILD SELWAY RIVER
Mile 95
Mile 96
Decker Creek
Hot Point
Creek
Elk City
Browns Spring
Goddard Creek
Lookout Butte
VABM 5869
EXISTING AND REPLACEMENT OLD GROWTH
Existing Old Growth
Replacement Old Growth
12 Management Area Number
1 Survey Unit Number

TABLE 3.12 - EVALUATION OF PROPOSED TIMBER HARVEST UNITS

HARVEST UNIT #	ACRES	SCORE	OLD GROWTH ATTRIBUTES	OLD GROWTH VALUE	COMMENTS
01	37	10	Large Tree Age, Large Dead Wood & Misc	Old Growth	
02	34	7	Canopy Closure, Canopy Structure & Misc	Replacement Old Growth	Stand lacks Large Tree Age, Snags & Large Deadwood
03	38	9	Snags & Large Dead Wood	Replacement Old Growth	
04	37	8	Stand Decadence	Replacement Old Growth	
05	30	7		Replacement Old Growth	
06	40	2	(Age, Large Dead Wood & Misc)	(Old Growth?)	Determination based on aerial photo interpretation. Unit is similar to Unit 7.
07	37	10	Age, Large Dead Wood & Misc	Old Growth	
08	23	7	Large Dead Wood	Replacement Old Growth	Stand character is monotypic
09	40	8	Canopy Closure	Replacement Old Growth	Stand lacks Large Tree Age and Large Dead Wood
10	30	6	Stand Decadence	Replacement Old Growth	Lacks large tree age and canopy closure
11	40	6		Replacement Old Growth	Lacks large tree age
12	30	7	Large Dead Wood	Replacement Old Growth	
14	40	7	Canopy Structure	Replacement Old Growth	Lacks large tree age

5. Forage

The dominant habitat types within the proposal area are the following: western redcedar/ queencup beadlily, western redcedar/wild ginger, western redcedar/lady fern, grand fir/ queencup beadlily, and grand fir/wild ginger (Cooper, et al, 1987). These habitat types support excellent low forage production for domestic livestock and big game when sufficient light is allowed to penetrate to the forest floor, but in most cases, this potential also causes young trees to close their canopy rapidly at 20-30 years, thus shading out understory vegetation of all types.

Silvicultural treatments in these habitat types can stimulate forage production for cattle and big game through removal of the tree overstory. Forage production following silvicultural treatment within these habitat types ranges between 300 and 1,000 pounds/acre/dry weight, depending on the type of treatment and the time since disturbance (Green 1989). The occurrence of suitable forage in any project area is manipulated by scheduling timber harvest activities and applying subsequent silvicultural practices that increase light penetration to the forest floor.

Portions of the Clear Creek-Tahoe Range Allotment lie within the Upper Swiftwater analysis area in portions of T 32 N, R 6 E, Sections 24 and 25 and T 32 N, R 7 E, Sections 30 and 31. This allotment has two permitees running a total of 110 cow/calf pairs from June through September. These cattle typically utilize areas outside the Upper Swiftwater analysis area (Pine Knob, Potato Hill, Lookout Butte and Dusty Saddle) and can rarely be found within the Swiftwater drainage.

Occurance of noxious weeds in the proposal area is limited. Minor populations of larkspur, spotted knapweed, and Canada thistle are know to exist in the area. The habitat types are relatively warm and moist, supporting a highly diverse assemblage of understory species. The intense competition for available moisture and light within these habitat types inhibits the competitive advantages that these noxious weeds display on poorer sites.

6. Special Resources

Within the analysis area, Pacific yew (**Taxus brevifolia**) can be found as an understory shrub and/or tree in conifer stands. Management Area 21, as described in the Forest Plan, designates objectives and standards for management of this vegetation as it relates to moose winter range habitat. The interdisciplinary team does not propose any of the stands in the analysis area for designation as MA 21. Only a few stands on the edge of the analysis area exhibit characteristics desireable for moose winter range and these values are overshadowed by their small, scattered nature.

A chemical extracted from yew is showing promise as a treatment for certain types of cancer in humans. The only currently acceptable source of this chemical is from the bark of the Pacific yew. Without a breakthrough providing an alternate source of this chemical, all yew that is naturally present on National Forest Lands could be subject to a high demand as a supply of bark/chemical. It would be appropriate to make the limited amount of yew in the Swiftwater area available for harvest under the guidelines for preservation of the species.

F. Threatened, Endangered and Sensitive Species

1. Wildlife

THREATENED OR ENDANGERED

During the scoping of the Swiftwater Area Analysis, the U.S. Fish and Wildlife Service indicated the gray wolf (*Canis lupus*) could be impacted by land management activities in this study area.

Although not identified by the USF&WS, bald eagles (*Haliaeetus leucocephalus*) are known to occur in the winter along the extreme lower margin of the Swiftwater study area. Because of the proximity of the Swiftwater analysis area to the Bitterroot Grizzly Bear Recovery Area, the USF&WS suggested also including grizzly bear (*Ursus arctos horribilis*) in the environmental analysis.

The study area is approximately 2.5 km by 7 km. The entire Forest Service portion of the study area is within the commercial forest timber base. Sight distances are limited in the study area by dense coniferous vegetation on 80+%. The study area is considered relatively accessible by vehicles and hiking. Black bear hunting and the general big game season directly provide opportunities for illegal wolf and grizzly bear mortality.

The study area is not the spatial unit to consider for wolf or grizzly bear recovery needs. It is removed from relatively isolated roadless areas and the Selway-Bitterroot Wilderness Area where sufficient living space for a wolf and grizzly bear is expected.

Different level surveys have been conducted for the species below. These surveys have the following characteristics:

LEVEL A	No field survey completed. Interpretation based on aerial photo inspection and review of existing records and surveys.
LEVEL B	In addition to the LEVEL A survey, one field visit was completed in areas of probable habitat.
LEVEL C	Based on information gained in LEVEL A and LEVEL B surveys additional surveys were conducted during the most favorable season suited for the individual species.

a. Wolf

Wolves use areas which provide sufficient space to hunt and travel corridors while offering limited exposure to humans. Wolves use forested cover to provide security from human disturbance particularly around denning and rendezvous sites.

They have extensive home ranges and specific habitat requirements for denning, rearing young and foraging. Dens are usually located on moderately steep slopes with southerly aspects and well-drained soils usually within close proximity to surface water and at an elevation overlooking surrounding low-lying areas. Rendezvous sites, used for resting and gathering, are complexes of meadows that have adjacent hillside timber with nearby surface water. Both dens and rendezvous sites are often characterized by having nearby forested cover, remote from human disturbance.

Wolves prey primarily on ungulates such as elk (**Cervus canadensis**), white-tailed deer (**Odocoileus virginianus**) and moose (**Alces alces**). Their alternate prey base typically consists of smaller mammals and birds, such as beaver (**Castor canadensis**), small rodents, rabbits and grouse. Calving and fawning areas are important as wolves often selectively prey upon newborn ungulates. Inadequate or deteriorated ungulate winter range can limit big game populations.

The Swiftwater area provides year-round habitat for the wolf's prey base. Elk or deer habitats within the study area would not limit wolf recovery. Also, while beaver do not inhabit the study area, they occur in the main Selway River immediately adjacent to the study area.

A combination of relatively steep terrain, dense forest and cool aspects limit potential sites considered desirable denning sites. The potential sites most suitable for denning (drier aspects, gentle terrain and deep soils) are in close proximity to a major Forest Service Road (Rd 470). The overall suitability of the study area for wolf denning and rendezvous is considered marginal at best.

Use of Upper Swiftwater study area by humans is frequent, and common, particularly during hunting season. During the general big game hunting season, human disturbance along the Swiftwater Creek watershed divide should be considered moderate to high. The preferred action will cause a minor increase in road access into the interior Upper Swiftwater study area.

Forest biologists currently suspect, based on confirmed sightings of gray wolves on forests immediately adjacent to the Nez Perce National Forest, that wolves are present on the Forest. A significant factor supporting the suspicion, is the juxaposition of the Forest relative to wolves possibly traveling the Bitterroot Range from Canada to central Idaho. The Nez Perce Forest bisects that likely travel corridor.

Approximately 15 probable reports of wolf or wolf sign have been documented on the Selway Ranger District since 1972. None have been verified as known wolf sightings. During May and early July 1991, several reports of possible wolf sightings had occurred on the Selway Ranger District. An animal, determined to be a wolf hybrid, was captured and removed from the district in late July, 1992.

One report has been documented in the Swiftwater analysis area. This was of howling in the Pine Knob and Lodge Point areas in 1984. Six additional reports of possible wolf or wolf sign were reported approximately 4-5 air miles from the perimeter of the Swiftwater analysis area. One report was of howling in the Rackcliff drainage (1985) and originated from an observer on Coolwater Lookout. A possible sighting in 1982 was made by an observer located on US Highway 12, looking across the Middle Fork Clearwater River approximately 1 mile west of Lowell. The third report was of 5 adult wolves on forest road 286, approximately 2 miles southeast of Lookout Butte.

A Level A Survey for wolf habitat characteristics was done in the Upper Swiftwater study area. Despite this evidence above, no absolute confirmation of wolves has yet been made on the Forest; no active dens or rendezvous areas are known to exist. All reports of possible wolf sightings in or near the Swiftwater analysis area have been isolated events (i.e., no patterns relating to frequency or distribution were observed; reports were not verifiable; recent reports have not been received). These reports offered little evidence to support a rating as verified wolf sightings. Based on the absence of wolf sightings on the Selway Ranger District, the Swiftwater analysis area has a Low Potential for wolf habitat or presence.

b. Grizzly Bear

Dispersed camping, other outdoor recreation activities and industrial forestry practices occur in the Upper Swiftwater study area. The area is reasonably accessible by driving and hiking. Dense coniferous vegetation and steep, rugged terrain dominate 80+% of the study area.

Little camping occurs on the Upper Swiftwater study area except during the general big game hunting season. The area is included in an existing, permitted big game hunting outfitting area. The presence of recreationists and industrial forestry crews during snow-free periods of the year, makes the potential for human/bear encounters moderately probable.

The Upper Swiftwater study area provides year-round range to elk and deer. The supply of ungulate prey available to grizzlies should remain static or possibly increase with the preferred action. The Upper Swiftwater study area is generally below 5000' elevation. This coupled, with its relative accessibility to human disturbance, make the study area marginal (at best) for grizzly bear denning. The planned action is not expected to affect denning site potential.

A Level A Survey for grizzly bear habitat characteristics was done in the Upper Swiftwater study area. Based on the absence of grizzly bear sightings on the Selway Ranger District, the likelyhood that grizzly bear currently inhabit the study area is low. The project study area is entirely outside of the Bitterroot Grizzly Bear Recovery Area. The degree of cover loss and disturbance by the preferred action on the bear or its habitat is inconsequential to grizzly bears or its ungulate prey base.

c. Bald Eagle

A portion of the extreme lower elevations of the Upper Swiftwater study area borders the lower Selway River. The bald eagle is a winter resident and has been observed from September through July along the Middle Fork of the Clearwater River, the lower Selway River and surrounding areas on the Nez Perce National Forest. The lower Selway and Middle Fork Clearwater Rivers are known wintering areas for bald eagles. No active bald eagle nests are known or suspected in the Selway, Lochsa and Middle Fork Clearwater River drainages.

The primary food source for bald eagles wintering in this area is carrion found near the rivers. Carrion from wintering ungulates provide a good food source throughout most winters.

A Level C Survey for bald eagle habitat characteristics was done in the Upper Swiftwater study area. Bald eagles are present within the general area of the study area. Assessment of the survey results indicated that wintering bald eagles use the extreme lower elevations at the margin of the study area.

SENSITIVE SPECIES

The NFMA regulations specify that fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native species (36 CFR 219.19). The Forest Service has established a "sensitive" category of animal, plant, and fish species whose viability is a concern and has specified that management practices will be implemented to insure that these species do not become threatened or endangered because of Forest Service actions.

The biological assessment addresses the sensitive species listed in Tbale 3.13, on the next page.

TABLE 3.13 - LIST OF SENSITIVE WILDLIFE SPECIES

COMMON NAME	SCIENTIFIC NAME	IDENTIFYING AGENCY
Black-backed & Three-toed Woodpeckers	**Picoides articus & P. tridactylus**	USFS
Boreal Owl	**Aegolius gentilis**	USFS
Coeur d'Alene Salamander	**Plethodon vandykei**	USFS
Flammulated Owl	**Otus flammeolus**	USFS
Fisher	**Martes pennanti**	USFS
Harlequin Duck	**Histrionicus pennanti**	USFS
Lynx	**Felis lynx canadensis**	USFS
Western Big-eared Bat	**Plecotus townsendii**	USFS
White-headed Woodpecker	**Picoides albolarvatus**	USFS
Wolverine	**Gulo gulo luscus**	USFS

a. Black-backed and Three-toed Woodpeckers

The black-backed and three-toed woodpeckers have a similar habitats. However, their distribution varies. Generally, the three-toed occurs at higher elevations while the black-backed occurs at lower elevations. Although these species are uncommon, even in thier preferred habitat, they are most frequently found in burned, harvested or beetle-killed forests where large, standing dead trees are numerous. These species require dead trees, or live trees with dead heartwood, for nesting and feeding sites, and seems to prefer large trees. Black-backed and three-toed woodpeckers invade burns and windfall areas to feed on insect-infested dead or dying trees.

Home ranges are approximately 120 acres or extend approximately .25 miles from the nest, include foraging and roosting sites, and are typically dominated by stands of large conifers. Lodgepole pine trees appears to be the principal species used by three-toed woodpeckers for foraging. Nesting cavities are excavated in snags, stumps or live trees with dead heartwood (especially in burned areas).

A Level A Survey for black-backed and three-toed woodpeckers habitat characteristics was done in the project study area. This survey determined the study area did not contain live or burned conifer (i.e., burned by wildfire with dead trees standing) stands that would typically be suitable for these species. Assessment of the survey results indicated a Low Potential that black-backed and three-toe woodpecker or their habitat exists within the study area.

b. Boreal Owl

Boreal owls typically inhabit mature and old growth sub-alpine fir (**Abies lasiocarpa**) at 5,000'+ elevation. They may also use Engelmann spruce (**Picea engelmannii**), Douglas-fir (**Pseudotsuga menziesii**), ponderosa pine (**Pinus ponderosa**) and logdepole pine (**Pinus contorta**) habitat types. They commonly use mature and old growth stands that are interspersed with openings of meadows or shrub cover.

Boreal owls are secondary cavity nesters, requiring cavities usually created by primary cavity excavators. This owl primarily uses cavities excavated by pileated woodpeckers (**Dryocopus pileatus**). Typical nesting habitat includes stands which are uneven-aged, multi-layered canopy with open understory, and large trees 15+" dbh. Boreal owls commonly forage for small mammals, small birds and insects in multi-storied old growth stands interspersed with meadow or shrub openings.

Boreal owls have winter home ranges of approximately 3600 acres, summer home ranges of 2900 acres and a year round home range of 5250 acres. Winter roost sites are typically located in bottoms and usually have fewer sapling and poles within the stand. Summer roost sites typically are located on mid to upper slopes in dense forest with canopy covers that are greater than those used in winter. Boreal owls select these denser stands in summer as they provide cooler microsites during hot weather. Typical boreal owl roost sites in Central Idaho are in dense conifer stands (approximately 120 trees/acre less than 6" dbh) with at least 1-2 trees/acre greater than 15" dbh; nest trees are approximately 10-11" dbh.

The presence of boreal owls was only recently (within the past 15 years) documented in Central Idaho. In March 1989, the Nez Perce Forest contracted with the Idaho Natural Heritage Program to do boreal owl surveys. Four boreal owl sigthings were confirmed on the Red River Ranger District. Surveys found the owls principally in mature subalpine fir habitat types between 5,000 and 7,400 feet elevations. No owls were documented on the Selway Ranger District and no record of past boreal owl sightings is known.

A Level A Survey for boreal owl habitat characteristics was done in the project study area. This survey determined the project study area above 5000' elevation does not contain stands of lodgepole pine or mature subalpine fir. Assessment of the survey results indicated a Low Potential that boreal owls or their habitat exists within the study area.

c. Coeur d'Alene Salamander

Coeur d'Alene salamanders are typically associated with disjunct coastal biota of the Rocky Mountains primarily north of the Salmon River. This salamander is most often found in moist forested areas at moderate elevations below 5,000 feet elevation. They occur in wet, humid, and cool microhabitats where precipitation exceeds 20" per year. Typical habitat features are fractured bedrock or gravel, often under a dense tree canopy, near cascading water. Coeur d'Alene salamanders feed primarily on aquatic and semi-aquatic insects and are most often found in moist talus, rocky seeps, the spray zone of falls and occassionally rocky areas adjacent to small streams.

Documented populations have been located on the Selway River drainage and the Meadow Creek drainage on the Nez Perce National Forest. These populations represent the most southern distribution of Coeur d'Alene salamanders. On the lower Selway River, these salamanders are found generally below 2500' elevation in three main habitats; spring seeps, waterfall spray zones, and streamsides of small cascading creeks.

A Level B Survey for Coeur d'Alene salamander habitat characteristics was done in the project study area. Records for the Selway Ranger District indicate Coeur d'Alene salamanders have been documented in at least 11 sites. The results of the Level B Survey indicate a High Potential that Coeur d'Alene salamanders are present in the study area below 3000' elevation.

d. Flammulated Owl

Flammulated owls occur in Idaho at elevations up to about 5700' and are typically associated with large ponderosa pine and Douglas fir trees on south and western slopes. Suitable habitat varies from open, old-growth ponderosa pine (with little understory) to multi-layered, closed canopy of mixed Douglas-fir and ponderosa pine, to mature forests.

Flammulated owls are obligate secondary cavity nesters nesting in enlarged common flicker and pileated woodpecker cavities. Flammulated owls are almost entirely insectivorous, often foraging on lepidopteran larvae, nocturnal moths, orthopterans, coleopterans, spiders, and other arthropods. They typically forage in open forest stands and edges between forest and grasslands types.

Home range sizes appear to be determined by patchiness of overstory trees and age, and range shape is determined by topography and juxtaposition of neighboring suitable habitat. On the Nez Perce National Forest male breeding densities have been estimated between 1 and 4 males per 10 hectare.

In 1992, a flammulated owl survey was conducted on portions of the Nez Perce National Forest to determine distribution. Flammulated owls were documented on Salmon River and Red River Ranger Districts; no flammulated owls were documented in the South Fork of the Clearwater River drainage. The Selway Ranger District was not formally surveyed. However, a flammulated owl was documented in lower Hamby Creek (approximately 10 air miles from the Upper Swiftwater study area).

A Level A Survey for flammulated owl habitat characteristics was done in the project study area. This survey determined the lower portions of the project study area below 5000' elevation did not contain stands of large ponderosa pine or Douglas fir. The sites most suited to potential flammulated owl habitat were located on the southeast aspect within elk winter range. However, the stands where large ponderosa pine or Douglas fir occur are not open or multi-layered (as described above). Assessment of the survey results indicated a Low-Moderate Potential that flammulated owls or their habitat exists within the elk winter range portion of the study area.

e. Fisher

Fisher typically inhabit moist, mature and old growth grand fir (**Abies grandis**) habitats, particularly those with Pacific yew (**Taxus brevifolia**) above 4,000' elevation. They may also use sub-alpine fir, Engelmann spruce, Douglas-fir and logdepole pine habitat types. They also spend much of their time along riparian zones.

The direct and indirect effects of the proposed activities on fisher or potential fisher habitat include increased potential for human disturbance and associated risk of mortality. Cumulative effects to the fisher or its potential habitat would be due to ongoing and proposed timber sales east and west of the project area. Continued human disturbance may limit the potential for this area to support fisher.

A Level A Survey for fisher habitat characteristics was done in the project study area. This survey determined the project study area to be below 5000' elevation and that mature subalpine fir habitats were unlikely. Monitoring surveys indicate that fishers are present on the Forest. No sightings have been documented in or near the project area. Assessment of the survey results indicated a Low Probability that fishers or their habitat exists within the study area.

f. Harlequin Duck

Harlequin ducks are diving ducks that winter along the Pacific coast and then migrate inland to nest along forested, mountain streams. Harlequin ducks prefer canyon channel types; they may also use meandering and braided channel types. The preferred dominant streambank vegetation is shrubs usually willows (**Salix spp.**) or dogwoods (**Cornus spp.**). They are also known to use streams where the dominant streambank vegetation is primarily trees.

Physical features such as streambank vegetation, stream gradient and a buffer from human disturbance provided by the streams and riparian zones are key to nesting and brood-rearing habitat. Undisturbed, pristine areas are considered prime habitat for nesting and brood-rearing areas required by harlequin ducks. Harlequin ducks require security cover to provide a buffer from human disturbance.

Harlequin ducks are known to occur on the Nez Perce however, a breeding pair has yet to be documented on the forest. In 1989 a number of sightings were reported for the forest. Two sightings have been documented on the lower Selway River (1989 and 1991). Both sightings were outside of the project area.

Review of historical and current records indicate that harlequin duck sightings are rare. Harlequin ducks are known to occur on the Nez Perce, however, a breeding pair has yet to be documented on the forest. However, in 1989, a number of sightings were reported for the forest. Two sightings have been documented on the lower Selway River (1989 and 1991). Both sightings were outside of the project area.

A Level A Survey for harlequin duck habitat characteristics was done in the project study area. Based on the prefield review and habitat assessment it was determined that the road disturbance and lack of hiding vegetation were not within the habitat tolerances used by harlequin ducks. Assessment of the survey results indicated a High Potential that harlequin ducks migrate on the river corridor at the margin of the study area; Low Potential that its breeding habitat exists within the study area.

g. Lynx

The lynx has been documented to occur on the Nez Perce National Forest. They are known to occupy habitats in Idaho occurring at elevations above 4,000' elevation. They utilize Englemann spruce, sub-alpine fir or logdepole pine habitats that provide a mosaic of forest age classes. They require early successional habitats for foraging and forested habitats for security, cover and denning. They prey almost exclusively on snowshoe hares (**Lepus americanus**).

Lynx utilize early successional habitats or forest age classes of approximately 6+ years occurring in at least 20-25 acre patches. Their foraging habitat can best be evaluated by evaluating snowshoe hare habitat. Snowshoe hares have a home range of 20-25 acres and require both forage and thermal cover. Limiting habitat factors for snowshoe hares are winter forage (willows, birch and conifers) and thermal cover. Snowshoe hare thermal and security cover is characterized by stands with 3,000+ stems per acre and coniferous tree heights of 11.5 feet or greater. Thermal and security cover are important in that snowshoe hares may select this habitat even if browse is limited.

Lynx denning habitat is characterized as mature forests with mesic habitat associations on N and NE aspects. Denning sites require a high density of down-logs 1-4' above the ground. Denning areas range from 1-5 acres, connected by mature forest travel corridors accessing prey habitat.

Lynx require forested cover to provide security and facilitate hunting success. They usually will not cross openings greater than 300 feet. Favored travel routes are forested areas along ridges and saddles.

A Level A Survey for lynx habitat characteristics was done in the project study area. An unconfirmed sighting was reported in late January 1993, near Lowell, Idaho, approximately 1.5 airmiles from the perimeter of the Upper Swiftwater study area.

Assessment of the Level A Survey results indicated the project study area does not contain significant mature subalpine fir habitats. However, because of the recent probable (but unconfirmed lynx sighting near Lowell), a low to moderate potential that lynx or its habitat exists within the study area.

h. Western Big-eared Bat

Western big-eared bats are found in a wide variety of habitat types and most notably occur in the southern part of Idaho. They roost in caves or cave-like structures for hibernacula and maternity roosting sites. In winter, western big-eared bats roost communally in sites called hibernaculas.

The females are dormant during both the day and night period, however, males are less apt to hibernate and may frequently change their winter roost sites. Western big-eared bats form nursery colonies in the spring and summer in which just the females and young roost. The males and non-reproductive females roost alone during the summer.

They are insectivorous and feed primarily on moths. They do not migrate over long distances, however, they do move from one roost site to another.

A Level A Survey for western big-eared bat habitat characteristics was done in the project study area. Review of historical and current records indicate that no sightings of the western big-eared bat have occurred on the Selway Ranger District. The presence of Western big-eared bats on the Nez Perce National Forest has not been confirmed. Assessment of the survey results indicated a Low Potential that western big-eared bats or their habitat exists within the study area.

i. White-headed Woodpecker

White-headed woodpeckers range from southern British Columbia south through Washington and Idaho to southern California. The species occurs in mixed coniferous forests between 3,500-9,000' elevation. White-headed woodpeckers typically prefer open canopy stands of large trees (particularly ponderosa pine). In Idaho, white-headed woodpeckers use mature or older forested stands which contain snags with advanced decay. This species has also been observed foraging and nesting in partially logged areas.

In Idaho, white-headed woodpeckers are not known to nest in stands with more than 26% canopy cover or 166 trees/acre. They typically excavate nest holes in the bottom 10' of large (23+" dbh) snags or stumps which are in advanced decay. Nest sites may be located in dry meadows, along forest edges or in selectively logged areas. Stand age is apparently not critical, provided a sufficient quantity of mature and older trees are available for nesting and foraging.

Home range size of white-headed woodpeckers averages 20-25 ac. White-headed woodpeckers feed mainly on seeds from live cones and on insects (including larvae) and arachnids. They usually feed on the lower 13' of large (>10" dbh), live ponderosa pine trees. The birds drink water regularly and may require a water source within their home range. White-headed wood-

pecker's habitat loss, where they historically occur in Idaho, is due to the commercial harvest of mature, large diameter trees.

A Level A Survey for white-headed woodpecker habitat characteristics was done in the project study area. This survey determined that the lower portions of the analysis area below 5000' elevation on south aspects contain limited numbers of large ponderosa pine and Douglas fir. Assessment of the survey results indicated a Low Potential that white-headed woodpecker or their habitat exists within the study area.

j. Wolverine

Wolverines typically inhabit large areas of medium or scattered mature timber and ecotonal areas around slides, cliffs,and swamps. Habitat types used by wolverines include subapline fir, logdepole pine, western larch, Douglas-fir and mixed conifer. Wolverines rarely utilize dense young timber stands, burned over areas or wet meadows.

Wolverines prefer remote mountainous habitat with little human disturbance or essentially roadless areas. They are known to cover long distances but can exhibit fidelity to certain areas. Male home ranges are known to average approximately 163 square miles and female home ranges averaged approximately 150 square miles.

Wolverines usually winter at approximately 4500' elevation and summer at elevations exceeding 6000'. Wolverines are omnivorous and opportunistic scavengers, taking advantage of food sources that are easily obtained. Wolverines prey on deer and elk, other mustelids, snowshoe hare, small mammals and birds. They also feed on carrion, insects and berries and often cache their food in trees or under snow and ice.

Wolverines are considered uncommon and have a restricted distribution in the state of Idaho. Review of historical and current records indicate that wolverine sightings are rare. Four reports of wolverine have been reported however only one has been confirmed within 30 miles of the analysis area. Unconfirmed tracks and at least one confirmed sighting of a wolverine have been made on the Nez Perce National Forest in the past five years. One probable wolverine sighting was reported in 1989, on the Selway Ranger District.

A Level A Survey for wolverine habitat characteristics was done in the project study area. The Upper Swiftwater study area does not contain elevations or habitats which could be used (at least seasonally) by wolverine. A wolverine sighting was reported within six airmiles of the project study area, this appears to be an isolated occurrence (based on sighting records across the Forest). Assessment of the survey results indicated a Low Potential that wolverine inhabits the study area.

2. Fish

THREATENED OR ENDANGERED

a. **Fall Chinook Salmon**

Fall chinook salmon typically spawn in mainstem portions of the Clearwater River. Habitat currently utilized is the Clearwater River from the confluence with the Snake River upstream to an area near the mouth of the North Fork of the Clearwater (near Orofino, Idaho). Historic fall chinook habitat in the Selway River is found from the confluence with the Lochsa River upstream to Selway Falls. The northern boundary of the Swiftwater analysis area is downstream from Selway Falls, within the historic fall chinook range

Level C surveys were conducted for all threatened and sensitive fish species and their habitats. The survey revealed that chinook salmon are found in the Selway River. Redds were observed just downstream of the mouth of Gedney Creek during Septembers of 1990, 1991 and 1992. Also in 1992, chinook salmon redds were observed and documented just upstream from the mouth of Gedney Creek in the Selway River. Chinook salmon were observed using these redds. Juvenile chinook salmon were observed in Gedney Creek, a major tributary of the Selway River approximately 15 miles east (upstream) of Swiftwater Creek, as late as 1984.

Fall chinook salmon typically spawn in mainstem portions of the Clearwater River. Their habitat extends up the Clearwater system as far as Selway Falls on the Selway River, and includes the Middlefork of the Clearwater River. The streams within the analysis area are tributary to historic (not current) fall chinook habitat.

All races of chinook salmon need clear streams with silt-free, gravelled riffles with average water depths of 9-42 inches, and water velocities of 1.5-3 feet per second. Being a large fish, there is a great need for adequate escape cover near spawning areas. Large deep pools with undrcut banks or large debris or boulders are needed for security and resting until water temperatures fall to levels required to induce spawning.

Chinook salmon are grouped by the time of year they enter a river to spawn. Spring chinook enter the Columbia River from March 1 to May 31, summer chinook enter from June 1 to July 31, and fall chinook usually enter from August 1 to November 30. Spring chinook enter the Snake River and its tributaries from late March to June 17. Summer chinook runs are concentrated from June 18 to August 17 and fall chinook peak from August 18 to September 15. Spawning migrations used to take up to several months, but with dam construction and associated passage problems, recent studies have shown migration can be delayed significantly beyond these time frames (Bjornn, 1991).

Approximately 75 percent of the adult chinook salmon entering Idaho waters have spent one year in fresh water and three years in the ocean. The remaining 25 percent spend two years in freshwater, and two or three years in salt water (Simpson and Wallace, 1982). Chinook salmon can spend anywhere from 1-5 years in the ocean before returning to their natal streams.

The current range of chinook salmon has been severely reduced from historic levels by dam construction on the Columbia and Snake Rivers and thru degradation of their habitat by various land management practices.

Prior to construction of the Lewiston Power Dam in 1927, the Clearwater River and its principal tributaries supported an excellent run of spring and possibly summer chinook. Since the dam lacked fish passage facilities, the runs were annihilated. Public outcry about the loss of the salmon resulted in construction of fish ladders several years later. The chinook failed to respond and repopulate the river system, and beginning in 1960 the Idaho Department of Fish and Game undertook an extensive program of planting eyed eggs directly into the gravel of tributary streams and some artificially constructed channels (Simpson and Wallace, 1982). Fall chinook did not respond these efforts, but spring chinook were successfully reestablished. Spring chinook remain at very low numbers to this day, and there is considerable interest among a variety of agencies about supplementation to augment fish numbers.

Only the fall run chinook salmon has been listed as threatened in the Clearwater River system. Habitat currently utilized is the Clearwater River from the confluence with the Snake River upstream to an area near the mouth of the North Fork of the Clearwater (near Greer, Idaho). Historic fall chinook habitat in the Selway River is found from the confluence with the Lochsa River upstream to Selway Falls. Boundaries of historic range were developed during Section 7

consultation between the Northern Region, Idaho Fish and Game and NMFS. The eastern boundary of the Swiftwater analysis area is tributary to the Selway River, within the historic fall chinook range.

There is no open fishing season for salmon in the Selway River.

SENSITIVE SPECIES

a. Spring/Summer Chinook

Spring chinook salmon typically enter many of the smaller tributaries to the Lochsa, Selway and Clearwater Rivers such as Meadow Creek and Moose Creek. Swiftwater Creek is tributary to currently used spring chinook habitat in the mainstem Selway. It does not provide any chinook habitat itself.

Spring chinook usually begin spawning from late August to early November. Activity on the lower Selway River has seemed to peak about the middle of September in most years (Hibbs, pers. comm.). Redds (the area prepared by a female salmon for the purpose of spawning) are usually 12 inches deep, and average about 4 square meters in area. Winter and early spring water temperatures determine the exact time of emergence, but this usually takes 5-6 months. All spring chinook, and some summer chinook migrate to the oceans as yearlings.

Spring/summer chinook salmon, steelhead trout, westslope cutthroat and bull trout have been listed by the Regional Forester as Sensitive species because their viability is a concern to the Northern Region. Steelhead and westslope cutthroat have been found in Swiftwater Creek. Spring/summer chinook do not utilize Swiftwater Creek.

Spring/summer and fall Snake River chinook salmon (*Oncorhynchus tshawytscha*) have been identified as threatened species under the Endangered Species Act by the National Marine Fisheries Service. Within the Clearwater River, only the Fall chinook has been listed. Fall chinook salmon have been observed as far upriver as Kooskia in 1991 (Pettit, pers. comm), although at this time these are believed to be strays from systems further down the Columbia system.

b. Steelhead Trout

Studies on the characteristics of steelhead trout redds (Orcutt, et. all) have shown that preferred minimum water depths are 0.7 feet; although maximum depths do exceed 5 feet. Water velocities at 0.4 feet above streambed averaged 2.3 to 2.5 feet per second, averaging slightly greater than that preferred by salmon. Steelhead prefer spawning gravels in the 0.5 to 4.0 inch diameter class (smaller than salmon); howver, they readily use smaller or larger gravels. The average redd size is 6.5 square meters, but can range between 2.9 and 13.4 square meters.

Steelhead utilize much smaller tributaries than salmon, and will move much further up the drainages into higher gradient sections to access suitable habitat. Most of the streams along the Selway support, or have historically supported steelhead populations, including Swiftwater Creek.

Cover is very important, and ideally should be 25% or more of the total stream area. Undercut banks, river debris piles, large logs and rocks provide the needed hiding and resting cover. Deep pools, low velocities are required winter elements.

Steelhead trout spend about half their lives in the Pacific Ocean. They spawn from March through early July in small headwater streams with fry emerging from the gravels in mid-June through mid-August.

Steelhead entering Idaho waters are of two races and are classified as A and B Group steelhead. The A Group enter both the Clearwater and the Salmon River systems and are quite generally widespread within each system. The B Group steelhead have a more restricted range. They are confined primarily to the North and Middle Forks of the Clearwater River and South and Middle Forks of the Salmon River. The average size of A Group steelhead is 4-8 pounds and B Group steelhead is 12-20 pounds. A Group steelhead enter the Columbia River earlier than the B Group. Both groups spend 2 or 3 years in freshwater and 1 to 3 years in the ocean (Simpson and Wallace, 1982). Swiftwater Creek supports wild B-run steelhead.

Population declines have been attributed primarily to dam construction; additional factors which have adversely affected steelhead populations include commercial fish harvest and increased sedimentation from land management activities which has affected the integrity of spawning and rearing habitats.

The Nez Perce National Forest currently has the habitat capability to produce roughly 15% of the summer steelhead within the Columbia River Basin; actual numbers are below full production capability.

There is no open fishing season for steelhead in the Selway River.

c. Westslope Cutthroat Trout

Westslope cutthroat trout prefer river headwaters and clear, deep lakes with water temperatures below 60 degrees Fahrenheit. Habitat diversity is important for cutthroat trout survival. Fry and juveniles require shallow water and slow flows for rearing. Structures such as boulders, log jams, and other debris supply cover to over-winter fish. Sediment free riffles are needed for spawning, and slow, deep pools are important as adult feeding and resting areas.

Westslope cutthroat trout are also adversely impacted by non-native species because they are poor competitors for food and space. Westslope cutthroat readily hybridize with other spring spawning trout, thereby reducing the number and genetic diversity of pure cutthroat populations. Westslope cutthroat are sensitive to fishing pressure. When cutthroat reside in a stream with steelhead, they are commonly confined to the upper reaches of the stream. This is the case in Swiftwater Creek.

The distribution of westslope cutthroat trout has been greatly reduced. Land disturbing practices that reduce availability of important habitat types reduce a stream's ability to produce cutthroat trout.

The areas where the westslope cutthroat is still the dominant trout are small compared to its original range. Although the westslope cutthroat has vanished from most of its range, there are areas where essentially pure native trout are relatively common, usually this is the case only in undisturbed stream sections at the highest elevations. Even though they have been exposed to hybridization, the native stocks show little or no outward sign of hybridization; that is, phenotypically they are S.c.lewisii. Such areas include the tributaries to the Clearwater drainage.

Local populations seem to be fairly common. These populations were subjected to years of intensive outplantings of hatchery rainbows along the Selway River, so the degree that these

local populations are genetically pure is not known. Cutthroat numbers tend to be depressed when found together with rainbow/steelhead. Populations densities are better in the extreme headwater areas where the rainbow component decreases. There are numerous trophy cutthroat streams in the area. Swiftwater Creek has a very limited presence of cutthroat.

New fishing regulations were imposed on the Selway River in 1992. Daily bag limit was reduced from 6 to 2 fish, with fish needing to be a minimum of 14 inches to be retained. Bag limits and seasons were shortened along tributaries to protect trout spawners.

d. Bull Trout

Swiftwater Creek does contain habitat that is suitable for bull trout, but they have not been identified during surveys. One reason for this may be the time of year the surveys have been conducted. Generally bull trout that are one year or older will have migrated downstream to larger rivers such as the Selway by early June. Most surveys are conducted after this time, and young of the year could easily be lumped as trout under 50mm.

Choice of spawning sites is influenced by a number of habitat variables. Shepard (1985) lists the following; higher stream orders (third to fourth), stream bed composition with a low percentage of boulders and greater amounts of gravel and rubble, low channel gradients, areas of overhanging brush, maximum stream tempratures of less than 18 degrees Centigrade,and areas of groundwater recharge (upwelling). Bull trout literature indicates a decided temperature threshold for the initiation of breeding. Temperatures generally need to drop to 9 degrees Centigrade or lower, with activity peaking at 5-6 degrees Centigrade. Along the Selway River, tributaries generally begin to reach these suitable ranges by mid-September. Swiftwater Creek is typical in this regard.

Clean bottom substrates and the presence of large woody debris are important in the rearing phase as bull trout are bottom dwelling as juveniles and are closely associated with lots of good cover elements. Undercut banks and deep pools are utilized as well. Gravel/cobble substrates are very important.

Low cobble embeddedness and high woody debris counts are critical in survival from egg to fry and for fry escape cover. High embeddedness results in low bull trout survival (population numbers).

Bull trout have long been confused with Dolly Varden. In 1978, the species formerly called Dolly Varden was split into two separate species; the inland form is now called bull trout.

Bull trout generally don't mature sexually until age 4 or 5. They are fall spawners, usually waiting until stream temperatures drop to 9 degrees Centigrade or lower in September or October to begin spawning.

Bull trout are largely resident or fluvial within the Clearwater and Selway River system, as there is no access to large lakes for the adfluvial life history. Many of the resident populations occupy headwater streams. Resident populations mature at an earlier age, are reduced in size, and age and have a low reproductive rate.

Repeat spawning does occur. Generally, bull trout spawners, especially in the fluvial populations, are older than first time spawners of other trout populations. Bull trout usually emerge from the gravels in late April or May. Most juveniles tend to focus on a fixed territory after emergence, and maintains this site throughout the summer. Plenty of instream cover allows higher fish densities; a lack of cover forces downstream migration.

Juvenile bull trout have very specific habitat requirements. Small bull trout are bottom-dwelling, seeking positions near or below the stream bottom. They often seek out shallow, low velocity side channels or eddies, particularly if they contain high numbers of woody debris.

After 2 or 3 years in the stream young fluvial bull trout will seek out the larger river systems where they mature. Generally this migration coincides with spring runoff, but may be precipitated by carrying capacities.

Adult bull trout in the larger rivers show the same decided preference as juveniles for deep pools of cold rivers. They will seek out the mouths of tributaries where water temperatures are moderated during the summer.

Hybridization with non native introduced brook trout, sedimentation and increases in stream temperature are thought to have had the greatest impacts on bull trout numbers.

There is little local survey data on the current range and populations of bull trout. Bull trout sightings wre not recorded on a single snorkel survey in 1989, 1990, 1991 or 1992. Generally little local knowledge exists on the bull trout.

Bull trout habitat requirements are becoming better known, so areas can be delineated that should provide the required elements. Bull trout are believed to occur in most major drainages on the Nez Perce Forest, including the Selway River drainage, but additional surveys are needed to accurately document presence and numbers in most drainages across the Forest.

Brook trout were extensively stocked into streams across the Nez Perce Forest in the past. Bull trout hybridize readily with brook trout. Since the hybrids are almost always sterile, this has contributed to population declines. Brook trout were not present in Swiftwater Creek.

3. Plants

THREATENED OR ENDANGERED

No plants listed or proposed as threatened or endangered species are known or suspected to exist in the Swiftwater area.

SENSITIVE SPECIES

Field surveys were conducted during the spring and summer of 1992 of all proposed activity areas. The Conservation Data Center and the US Fish and Wildlife Service were contacted for species lists and Forest Service records were searched for historical sightings of sensitive plants within the Swiftwater area. The above actions resulted in the following table (3.6) which lists the potential and known species of sensitive plants within the Swiftwater analysis area.

A Biological Assessment for these species has been completed for the analysis area and is contained in the project file, it is incorporated here by reference. Additional information can be found in Chapter 4.

TABLE 3.14 - SENSITIVE PLANTS IN THE SWIFTWATER ANALYSIS AREA

SPECIES	HABITAT REQUIREMENTS	PROBABILITY OF OCCURENCE
Bank Monkey Flower (*Mimulus clivicola*)	A regional endemic; inhabits steep southerly exposures in pockets of deep, moist, exposed soils. Known to occur along the Selway River in association with open ponderosa pine, Douglas fir and grand fir stands dominated by a grass and shrub understory.	Probability of plant occuring within study area is very low except in the extreme lower elevations in the NE portion of the study area.
Clustered Lady's Slipper (*Cypripedium fasciculatum*)	This orchid is usually found in moist to dry, often rocky sites beneath mature forests of mixed conifers or western red cedar.	Populations of this species have been documented at various locations within the Swiftwater analysis area. Field surveys on the Selway district have shown that this species is more abundant than previously thought.
Constance's Bittercress (*Cardamine constanceia*)	Appears to be widely scattered but common under old-growth western red cedar/maidenhair fern habitats (and other THPL habitats) near major streams; although, it does not grow in areas of deep shade.	Probability of species occuring within study area is high at lower elevations. A population has been documented at the mouth of Burned Creek and the Selway River.
Crinkle-Awn Fescue (*Festuca subuliflora*)	Often found under a forested canopy. May occur on moist slopes and in meadows. Lower western red cedar zones.	Probability of species occuring within study area is high in *THPL* habitat types in the lower elevations of the Swiftwater Study Area. A population has been documented at the mouth of Swiftwater Creek and the Selway River.
Dasynotus (*Dasynotus daubenmirei*)	Usually found in forest openings at mid to high elevations (3,100-6,200 feet). Often associated with Pachistima (*Pachistima myrsinites*), it generally occurs near mature stands of western red cedar, grand fir or subalpine fir.	Probability of species occuring within study area is moderate at the higher elevations.
Henderson's sedge (*Carex hendersonii*)	Bogs or springs to moist forest (THJA series with *Adiantum pedatum*) in the bottoms of river canyons.	Has been documented on the Selway District but not within the Swiftwater analysis area. The probability of this species occuring within the study area is high, especially at low elevations and valley bottoms.
Oregon Bentgrass (*Agrostis oregonensis*)	Boggy sites, wet meadows, and streambanks at mid to low elevations.	Probability of species occuring within study area is moderate at mid to low elevations. There are no known individuals or populations within the analysis area.
Oregon Bluebells (*Mertensia bella*)	Occurs in wet, seepy, open or partially shaded areas at elevations from 4,300 to 6,300 feet. On the Nez Perce this plant is found under grand fir habitat types.	A population of this species has been documented adjacent to the analysis area. (Lofts, 1991) Probability of this species occuring within the analysis area is moderate to high at the higher elevations.
Pacific Dogwood (*Cornus nuttallii*)	Usually found along streams in open to fairly dense forests. Found in early successional areas with western red cedar below 2,500 feet elevation.	Populations of this species have been documented along the Selway River in the extreme NE corner of the study area. Probability of this species occuring elsewhere within the analysis area is low.

F. Transportation System

HISTORY

Development of the first roads into the Swiftwater area began with the construction of the bridge across the Selway River at the mouth of Swiftwater Creek in 1936. This road, Road 470, was completed up the west side of the drainage, crossing into the Clear Creek drainage, in 1939. This was the first management activity in the Swiftwater area. In the early 1960's the road was reconstructed to accommodate modern logging trucks and lowboys for equipment hauling.

Transportation analysis of the Swiftwater area has determined that significant areas of instability occur throughout the drainage. There have been numerous field reviews of this area; since 1975 there have been at least three examinations of the area by road location specialists, Geotechnical Engineers, Logging Engineers, and others (reports from these examinations are contained in the Project File). These examinations have determined that a portion of the Swiftwater area, that area south of Swiftwater Creek downstream from the center of the northeast quarter of Section 19, T32N, R7E, cannot be roaded without unacceptable risk of slope failure and sediment production. To initiate timber harvest activities in this area logging systems not dependent upon roads adjacent to the proposed harvest units, primarily helicopters, would be required.

ACCESS MANAGEMENT

Access Management as defined in the Nez Perce National Forest Plan is-- "The management and distribution of Forest users." Access strategies or prescriptions are developed for a road, trail, or area that correspond to the objectives and standards for the management areas within a project area. The specific Forest Plan standard that is driving the access management strategy within the Upper Swiftwater assessment area, as well as most of the surrounding area, are the elk habitat objectives.

To achieve elk habitat objectives in the area the current access strateg is to close all local and primitive roads to all forms of motorized travel. There are no "area restrictions" in effect and there are no maintained trails in the area. The main or collector roads in the area are currently unrestricted. The table below shows all roads within the Upper Swiftwater analysis area and their current access prescription.

TABLE 3.15 - EXISTING ROAD ACCESS PRESCRIPTIONS

ROAD #	ACCESS PRESCRIPTION	TYPE OF BARRIER
470	OPEN YEAR-ROUND TO ALL MOTORIZED EXCEPT WHEN OBSTRUCTED BY SNOW THEN SNOWMOBILE USE IS PERMITTED	NONE
470 A-E	CLOSED YEAR-ROUND TO ALL MOTORIZED VEHICLES	CONCRETE BARRIER
1119 (JNCT 470 TO JNCT 9723)	OPEN YEAR-ROUND TO ALL MOTORIZED EXCEPT WHEN OBSTRUCTED BY SNOW THEN SNOWMOBILE USE IS PERMITTED	NONE
1119A	CLOSED YEAR-ROUND TO ALL MOTORIZED VEHICLES	GATE
1119 (JNCT 9723 TO JNCT 1129)	CLOSED YEAR-ROUND TO VEHICLES ABOVE 40 INCHES WIDE	GATE
9723	CLOSED YEAR-ROUND TO ALL MOTORIZED VEHICLES	CONCRETE BARRIER

There are four standard control/restriction designs that can be employed to implement access prescriptions; these are signs only, gates, barriers, and road obliteration. Combinations of these control designs are also used.

The most effective control design is road obliteration. Simply defined, a road is considered obliterated if it is physically not feasible for a motorized vehicle user to gain access to or easily travel on the road right-of-way. In the Swiftwater area, earthen barriers in combination with vegetation growth are in place on several older primitive roads. Where these occur, there has been no motorized use observed. Foot travel is possible and some minor use occurs by the most adventurous Forest user.

The next most effective control design is the use of barriers. Concrete barriers in conjunction with signs and a gate have been employed on four locations within the assessment area, Roads #470B, #470C, #470D, and #9723. Typically the concrete barrier is dug slightly into the road surface to prevent its movement. Often the gate is not locked in this situation, but is maintained in place in the event temporary use is required in the future. This type of installation is very effective against highway vehicles due to the size and weight of the concrete barriers. In the last five years only one breach by a highway vehicle has occured. This happened when the concrete barrier on road #9723 had not been properly dug-in and a vehicle was able to swing one section to the side. If the concrete barriers are located so that the entire width of the road is spanned, their effectiveness against ATV and over-snow vehicles is maximized. Due to the width of road #9723 at the closure location, the ditch has afforded a narrow bypass for some types of ATV vehicles. An estimated six violations each year occur at this location, all associated with hunting seasons. Enforcement efforts in the fall of 1992 have been expanded and has resulted in the successful prosecution of two violations.

On Road #1119A a gate with associated signing is employed to control access. This gate has not been breached by a highway vehicle in the last five years. This can be assumed since the gate has never been damaged and the lock has not be broken off. Two wheeled ATV's can

bypass the gate by traveling through the ditch. It is estimated that one violation each year may be occuring.

LOW STANDARD, TEMPORARY ROADS

In an appeal to the original Upper Swiftwater Environmental Assessment the National Wildlife Federation showed concern that that analysis did not look at the use of low-standard, temporary roads to be obliterated after their intended use.

The District Ranger and ID Team evaluated the proposed transportation system for the Swiftwater analysis area with respect to long-term resource management and environmental conditions, the results of this analysis are located in Chapter Four of this EIS.

G. Social and Economic

The social and economic setting of the Nez Perce National Forest is described on pages 3 to 8 of Chapter III of the Forest Plan EIS; it is incorporated here by reference.

The acceptance of the silvicultural practice of clearcutting is equally a social as well as a scientific issue. It is possible to demonstrate biologically and ecologically that clearcut harvesting is the optimum treatment for much of the Swiftwater assessment area. The existing even aged stands resulting from naturally occurring disturbances; wildfire and insect or disease infestations; are best duplicated by prescribing even age management. The site specific silvicultural prescriptions show the scientific rationale for clear cut harvesting.

The rejection of clearcutting is based upon social concerns. The image of an undisturbed forested environment represents National Forests in the minds of most Americans. When forest management, particularly clearcut harvesting, is applied to the land, people do not like the resulting impacts to the forest landscape. The gap between expectation and reality creates conflict. Many people want to resolve this conflict by making sure that reality matches their expectation by eliminating clearcutting of National Forest lands.

Where a clearcut is located and the amount of time that has passed since the trees were harvested are important factors on the acceptance of clearcutting. Clearcuts which are on gentle ground far from roads open to the general public are seldom noticed or objected to. In these situations the practice of clearcutting is socially more acceptable. On steeper ground visible from, or adjacent to, roads open to the public the adverse reaction to clearcutting increases.

This is where the amount of time from harvest enters into the thinking. When an area has been recently clearcut, the fuels have been reduced, and site preparation for reforestation has been completed; it is essentially devoid of conifers. The site will be reforested to a mixed conifer stand but brush and forbes usually dominate the site for up to 15 years. The conifers will then begin to reestablish dominance on the site. Approximately 30 years after the clearcut harvest, most sites appear to be healthy young stands of conifers. The time from initial harvest to dominance of the site by the newly established stand of conifers, about 20 years, is when most people can identify the unit as a clearcut and object to the appearance.

H. Air Quality

The atmosphere is a dynamic process interacting with other processes. As Hall (1972) indicated "we presume 'clean air' is an achievable reality. In truth, our knowledge of biology and other

sciences teaches us that clean air, all made up of many different gases, never existed and probably never will.

Air quality associated with the Upper Swiftwater analysis area is generally considered good to excellent most of the year. Local occurances of pollution result from dust from native-surfaced roads, sporatic debris, refuse and landscape burning, agricultural field burning, occasional wildfires, and prescribed burning of slash by private, state, and federal landowners.

The general climate of this area is transitional between a north-Pacific coastal type and a continental type. The Pacific influence is noted particularly by the autumn and winter peak in cloudiness and precipitation over most of the area, although amounts are further affected by the mountainous topography. The winter, at times, slips into the cold continental pattern. The Pacific high dominates in July and August resulting in hot and dry weather. There is normally a secondary peak of precipitation that occurs in late spring. Frontal storms that occur in the fall, winter, and most springs are low intensity, long duration occurrences. Thunderstorms occurring between May and October are accompanied by locally high winds, high intensity, and short duration events.

The normal wind pattern is from west/southwest. Normally restrictions on prescribed burning on the Nez Perce National Forest are imposed because of air stability and adverse effects on air quality in parts of western Montana. Locally, all major river canyons are subject to temperature inversions that can trap smoke and effect smoke dispersion in topographic basins. Temperature inversions are more common in the late fall and winter, although they can occur at other times of the year.

The atmosphere is self-cleaning within reasonable and predictable periods. Particulates (one of the two major concerns with prescribed fire, the other being hydrocarbons) are cleansed from the air when they become nuclei for condensing or freezing water and fall with the rain or snow. Historically, the atmosphere has been capable of handling particulates and gases from fire, sandstorms, and volcanic eruption. Present rates of release in urban areas are sometimes in excess of this capacity.

The Clean Air Act amendments of 1977, set up a process which included designation of Class I, II, and III areas of air quality management. The primary difference between Class I, II, and III areas are in the protection and processes provided for in the 1977 amendments. Class I areas receive the highest level of protection under the Prevention of Significant Deterioration (PSD) Program. The numerical criteria are less restrictive for Class II than for Class I areas, and similarly even less restrictive for Class III areas. This program regulates new major or modified stationary sources of air pollution through application of numerical criteria for specific pollutants and use of best available control technologies.

The Selway-Bitterroot Wilderness, 21 air miles to the east; and Hells Canyon National Recreation Area, 37 air miles to the southwest, are the closest Class I areas to the Upper Swiftwater analysis area. All other areas on the Nez Perce National Forest are designated Class II areas.

The Upper Swiftwater Timber Sale Area is non-classified, but is considered to be in attainment with the National Ambient Air Quality Standards. The closest area of non-attainment are portions of Missoula County, Montana (approximately 95 air miles to the northeast); and Boise and Sandpoint, Idaho (approximately 200 air miles to the south and north, respectively).

The Forest Service is a party to the North Idaho Smoke Management Memorandum of Agreement, which establishes procedures to regulate the amount of smoke produced by prescribed fire. These procedures are described in Chapter Four, Environmental Consequences.

III. DISCUSSION OF OTHER RESOURCES

A. Wildlife Management Indicator Species

There are 11 wildlife indicator species on the Nez Perce National Forest. These species are bald eagle, grizzly bear, gray wolf, peregrine falcon, elk, moose, bighorn sheep, pileated woodpecker, goshawk, pine marten, and fisher. Most of these species have been previously discussed in this Chapter. The following discussions will cover only those Management Indicator Species not included in the discussion of Threatened, Endangered, or Sensitive Species (i.e., peregrine falcon, moose, bighorn sheep, pileated woodpecker, pine marten and goshawk):

1. Peregrine Falcon

No reports of peregrine falcon have been documented in or near of the Swiftwater Area. The US Fish and Wildlife Service did not indicate that this species or its habitat occurred in the vicinity.

2. Moose

Moose inhabit the analysis area. Their use, however, is considered light. Pacific Yew, a significant moose winter forage, is very limited, occurring in isolated areas in a few stands in the upper elevations in the Swiftwater area. Typically, the yewwood in this area is associated with mature or old growth grand fir mosaic plant community. Approximately 160 acres of old growth grand fir mosaic have been designated MA 20 (old growth coniferous forest). There is no designated MA 21, moose winter range, within the analysis area and no management for moose is occuring at this time.

3. Bighorn Sheep

The nearest known bighorn sheep in the Selway River drainage, along with their habitat, occurs approximately 10-20 airmiles from the study area. The Swiftwater area is not known to have been historically used by bighorn sheep. Bighorn sheep typically use steeper terrain where they can better escape potential predators. The study area does not exhibit the steep, open terrain charactistic of suitable bighorn habitat. The lack of documented historic use indicates there is no suitable habitat for bighorn sheep in the Swiftwater study area.

4. Pileated Woodpecker

These woodpeckers typically prefer dense canopy stands of large trees for nesting and foraging and are known to occur in the Swiftwater Creek watershed. In Central Idaho, pileated woodpeckers typically use areas of mature or older mixed conifer forests which contain snags with advanced decay. Approximately 15% of the Swiftwater area is in mature coniferous forest older than 100 years. Their staple food is insects excavated from rotting standing or down trees, stumps or roots.

5. Pine Marten

Pine marten typically inhabit moist habitats in mature and old growth mixed coniferous forest. Approximately 15% of the Swiftwater area is in mature coniferous forest older than 100 years. No field surveys for pine marten or reports of sightings have been documented in or near the analysis area. Interpretation of aerial photos indicated a moderate potential that pine marten or its habitat exists within the higher elevations fo the the Swiftwater area.

6. Goshawk

Goshawks prefer mature timber stands with high canopy cover. They apparently seek areas beyond the nest that have a higher basal area, greater canopy closure, and more trees/ha. Because of this tendency, it may be difficult for this forest-adapted raptor to compete with raptors that do well in open environments.

Home ranges have been estimated to be approximately 20-25 acres. Permanent water sources, stands of dense timber (conifers) and mature forest edge appear to be significant factors associated with goshawk territory selection. Riparian zones, meadows or natural ecotones also appear important in affecting fidelity to previously selected territories.

Goshawks typically nest in stands of mature or old growth forest which have at least 60-80% crown closure and larger than 25 acres. They are known to reproduce regardless of the proportion of old growth in their range. However, stands of old growth or dense, mature conifers appeared to be important for increasing vegetative diversity within all home ranges. Nests are typically constructed below the upper canopy on limbs supported by one of the largest trees in the stand. Loss of breeding habitat is implicated to be the most critical factor affecting habitat suitability.

Goshawks typically feed on a variety of forest dwelling mammals and birds ranging in size from snowshoe hares (**Lepus Americanus**) to chipmunks (**Tamias spp.**). Goshawks are best suited to hunting near the ground or forest edge, especially during nesting season.

The Upper Swiftwater study area contains tree species and stands described as known or potential goshawk habitat. The forest in the Swiftwater analysis area is typically mixed conifer (greater than 60% crown closure) on warm, moist habitats. Water is common in most well defined draws throughout the study area.

Nearly all of the documented goshawk sightings on the Selway Ranger District in 1992, were located in mature (or approaching mature) Douglas fir/mixed conifer stands (as depicted in the literature). Mature (greater than 16" dbh) grand fir and Douglas fir trees are abundant throughout the study area and suitable for nest construction. Documented nest sites on the Selway Ranger District have been in non-old growth coniferous stands. These stands characteristically contained larger individual trees that supported nests.

A Level B Survey for goshawk habitat characteristics was done in the Upper Swiftwater study area. This survey was conducted at the time of the coniferous old growth forest survey. One goshawk nest was documented in the study area; another was discovered immediately adjacent to the study area. Assessment of the survey results determined that goshawks and their nesting habitat exists within the study area.

B. Recreation

1. Recreation Setting and Opportunity Classification

The Recreation Opportunity Spectrum (ROS) system is used to evaluate recreation resources on the Nez Perce National Forest (See Forest Plan EIS, Chapter III, pages 8 and 9). The Forest has been inventoried and divided into four ROS classes; primitive, semiprimitive nonmotorized, semiprimitive motorized, and roaded natural.

The ROS classifications for the Swiftwater analysis were established for Forest planning purposes. A re-evaluation of the ROS classifications of the area was performed during the integrated resource analysis, this evaluation concluded:

Roaded Natural/Roaded Modified.....3304 Acres
Semi-Primitive Non-Motorized.....730 Acres

The attributes of each ROS category are:

Roaded Modified (RM) - There is no distance or size criteria but these areas are often large and, except for easy access, feel remote during periods of inactive resource activity. The natural setting is modified by intensive resource activity (including roads) to the point that such activities are dominant from most any point in the setting. Roads vary from challenging minimum impact skid roads to very dominant high level of design roads and highways. User established sites are usually scattered in singles or small groups.

Roaded Natural (RN) - An area designated within 1/2 mile from better than primitive roads. There is no size criteria. Natural setting may have modifications which range from being easily noticed to strongly dominant to observers within the area. However, from sensitive travel routes and use areas these alterations would remain unnoticed or visually subordinate or unnoticed to the sensitive travel route observer. Rural or urban recreation facilities may exist as points within this setting.

Semi-Primitive Non-Motorized (SPNM) - An area designated at least 1/2 mile but not further than 3 miles from all roads or trails with motorized use; can include the existence of primitive roads and trails if usually closed to motorized use. Size must be greater than 2,500 acres. The SPNM within the Swiftwater area is a part of a larger block of land that extends into the adjacent Elk City Creek and Goddard Creek drainages, which in total exceeds the 2,500 acre minimum. Natural setting may have subtle modifications that would be notice but not draw the attention of an observer wandering through the area. Little or no evidence of primitive roads and the motorized use of trails and primitive roads.

2. Recreation Resources and Activities

TRAILS

Currently there are 8 miles of trail on the inventory in the area. These trails are:

Trail 706, Hot Point, is 5 miles long running from the Selway River near the mouth of Burned Creek, over Hot Point, to Road 9723 at its junction with Road 1119.

Trail 716, Swiftwater Crosscut, is 3 miles long running from near the six mile mark on Road 470, crosses Swiftwater Creek, and connects with Tr. 706 near road 1119A.

These two trails have not been maintained for over ten years and would require major reconstruction work to bring back to a usable standard. They are both low on the priority list to receive even minimal maintenance through regular trail maintenance allocations. As a result both of these trails currently provide little recreational opportunity to anyone other than the more adventurous hunter.

RIVER INFLUENCE

Driving for pleasure and sight seeing are the most important recreational activities along the Selway River Road. The clear waters and natural appearing forested environment provide the settings and viewing opportunities that are important to recreationists. Recreational activities relating to the river are very important during the spring, summer, and autumn. Floating the river, fishing, camping, and swimming are significant activities during these times.

HUNTING

In the majority of the assessment area hunting is the frequentrecreational activity. However, the steep terrain and minimum road access limit its popularity as a hunting area. Huntable populations of elk, deer, black bears, and cougars are present throughout the assessment area. Hunting pressures are greatest in the areas that are accessible by motorized means. Some type of hunting is available in the area in all months except July and August. Spring bear hunting in April-June, fall bear from September-October, general elk and deer season plus a late season muzzle loader hunt and a late whitetail buck hunt from October through December, and the season for cougar hunting is from September-February.

Several dispersed camping locations are within the assessment area. The use of these is most noticeable during the early weeks of the general deer and elk hunting seasons in October.

Two outfitters are permitted to offer services in the area. Lazy J Outfitters, operated by Larry Jarrett, offers guided hunting opportunities for all big game species in the area. Bob Smith also provides guided hunting opportunities in this area during the bear and cougar hunting seasons. Neither of the outfitters have any reserved camp sites in the area; both provide day-hunt opportunities based from the roaded portion of the area. Their actual use of the Swiftwater assessment area is light.

C. Noise

The Swiftwater analysis area is located in a rural area of North Central Idaho. There are no large cities or towns, populations of 10,000 or greater, within 100 miles of the Swiftwater area. This area is characterized by forested environments with minimal noise associated with man's activities.

It is common for noise associated with commercial logging; chainsaws, tractors, cable yarders, log trucks, etc., to be heard in or adjacent to the Swiftwater area. Within the past five years there have been approximately 222 acres in, or adjacent to, the Swiftwater area harvested in commercial timber sales. The noise disturbance associated with this timber sale activity has been localized and relatively short in duration.

The Elkard Timber Sale, approximately two miles south of the Swiftwater analysis area, currently under contract is scheduled to harvest about 397 acres of timber beginning in 1993. This timber is scheduled to be yarded by tractors, skyline equipment, and helicopters. Depending on local conditions, the noise associated with the Elkard Timber Sale will be noticable in the Swiftwater area.

D. Cultural Resources

A total of six (6) archeological sites, five (5) of which are eligible for nomination to the National Register of Historic Places (NRHP), exist within and in close proximity to the Upper Swiftwater analysis area. Archeological and ethnographic resources indicate the utilization of this area as

grounds for hunting, fishing, gathering and habitation both historically and prehistorically. Native American ridgetop trail complexes, later adopted by Euro-American settlers, offer access, through this area to the abundant natural resources of the Selway and Swiftwater drainages. Potentially significant archeological information may be located within this area. As such, the Upper Swiftwater analysis area is important in determining the temporal developmental land-use patters of the native inhabitants and early Euro-American settlers of the Region.

Of the nearly 4,000 acres with in the analysis area, 5% (217 acres) has undergone cultural resource survey as part of the proposed Upper Swiftwater T.S.(91-NZ-7-1) and the past Swiftwater T.S. (84-NZ-7-1) projects. During previous cultural resource survey work and supplementary research, four (4) previously recorded archeological sites (2 historic sites and 2 prehistoric sites) have been located within the analysis area. Of these, three (3) are eligible for nomination to the NRHP. Two (2) documented NRHP eligible prehistoric archeological sites have been located within close proximity (within 1/2 mile) of the analysis area boundary. A number of NRHP ineligible historic Forest Service administrative trails run through the area. Potential for locating additional cultural resource properties (CRP's) within the Swiftwater Analysis Area is dependant upon future cultural resource sample surveys of both high and low cultural site probability areas.

The existence of undocumented CRP's is highly probable in an estimated 13% (510 acres) of the analysis area. The remaining 87% (3524 acres) is considered to be low cultural site location probability area. The predicted percent of high/low cultural site probability acres, as presented here, is based upon topographical landforms, slope percentage and other associated natural features.

Notification and involvement of the Nez Perce Tribal Council concerning Native American cultural resource matters will be carried out as specified by the Code of Federal Regulations (CFR), 36 CFR 296.7. Detailed description and location of archeological and historic resources is exempt from disclosure under the Freedom of Information Act as stated in Forest Service policy (F.S.H. 6209.13, section 11.12) in accordance with the Archeological Resources Protection Act of 1979 (16 U.S.C. 470hh) and the National Historic Preservation Act of 1966 (16 U.S.C. 470w-3).

E. Wetlands and Floodplains

The streams in the Swiftwater area have little to no floodplain development because of their steep gradients and the shape of the stream channel. As shown on Figure 3.2, in the soils section of this chapter, there is approximately 32 acres of flood plains and alluvial fans located at the mouth of Swiftwater Creek which are on privately owned lands.

There are approximately 385 acres of riparian area within the Swiftwater assessment area. These riparian areas have been identified and mapped as MA 10 (see Chapter 1 Figure 1.3). All of the riparian areas in the Swiftwater assessment area are associated with perennial or intermittent streams.

Chapter Four

Environmental Consequences

CHAPTER FOUR

ENVIRONMENTAL CONSEQUENCES

I. INTRODUCTION

This chapter forms the scientific and analytic basis for comparisons of the alternatives, including the proposed action [40 CFR 5102.16]. It emphasizes measures to mitigate adverse environmental impacts [40 CFR 1502.16(h)] through compliance with Forest Plan standards [36 CFR 219.11(c)] and summarizes monitoring programs required by NEPA [40 CFR 1505.2(c)] and NFMA [36 CFR 219.11(d)].

A. Organization of This Chapter

Resources are discussed in the same order as in previous chapters. The effects of proposed activities are treated resource by resource instead of activity by activity; for example, the relationship between road construction and stream sedimentation is analyzed within the "Soils, Watershed and Fisheries" section rather than in "Transportation Systems". In other words, the format is effect-cause instead of cause-effect. This has been done to facilitate analysis of total impact on each specific resource.

Shown below is the format used for each recource section. In sections where more than one resource is discussed, such as "Soils, Wathershed and Fisheries" the section will have the following duplicated for each resource. Similarly, resources with multiple aspects will also duplicated the below format for each aspect of that resource. An example would be watershed where both water yield and riparian management are considered. This format was chosen to facilitate the comparision of alternatives for the decision maker and general reader.

GENERAL INFORMATION

This section will contain information on how the effects were determined including assumptions, models, research, and field study. As well this section will disclose any incomplete or unavailable information relevant to the effect analysis for that resource.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Direct effects to the resources will be displayed in this section. Direct effects are defined as those effects that are caused by, and occur at the same time and place as the action [40 CFR 1508.9(a)].

INDIRECT AND CUMULATIVE EFFECTS

This section centers on effects indirect or cumulative. These can be either beneficial or adverse. They are defined as follows:

* **Indirect** - Impacts that are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable [40 CFR 1508.8(b)].

* **Cumulative** - Those impacts which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions [40 CFR 1508.7].

Based on current technical literature and 40 years of site-specific experience, the Nez Perce Forest Plan EIS disclosed direct, indirect, and cumulative environmental impacts of timber harvest and road construction. The Forest Plan presented standards designed to mitigate the effects of these activities. Chapter IV of the Forest Plan EIS will not be repeated here; instead, this chapter will incorporate it by reference (40 CFR 1502.21), summarizing relevant sections and pointing out any significant differences between forest wide impacts and those specific to the Swiftwater area.

MITIGATION REQUIRED

Since the advent of NFMA planning on the Nez Perce approximately 10 years ago, public understanding of forest management issues and impacts of various management activities has increased dramatically. As many of the written comments on the draft EIS to the Forest Plan, Chapter Six display public, agency, and organizational concerns are now focused less on identification of specific, significant impacts than on the application and effectiveness of mitigation measures adopted in the form of Forest Plan standards.

As defined by 40 CFR 1508.20, mitigation includes:

* Avoiding the impact altogether by not taking a certain action or parts of an action;

* Minimizing the impact by limiting the degree or magnitude of the action and its implementation;

* Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

* Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

* Compensation for the impact by replacing or providing substitute resources or environments.

Forest Plan standards employ all of these measures. This chapter is a site-specific tie between impacts identified in Chapter IV of the Forest Plan EIS and Forest Plan standards for mitigating them.

It should be noted that NEPA does not require a fully developed mitigation plan in an EIS or impose a substansive duty on agencies to mitigate adverse environmental effects. The NEPA requirement is that mitigation be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated (Robertson v. Methow Valley, 1989 U.S. Supreme Court). However, other laws and the Nez Perce Forest Plan require that mitigation measures be implemented to a degree sufficient to provide for resource protection.

The effectiveness of many of these measures sould be self-evident; for example, the effectiveness of no harvest within a visually sensitive area to avoid visual impacts. In other cases the effectiveness of mitigation measures may be hard to quantify, but implementation would be preferable over doing nothing.

Forestwide monitoring of mitigation application and effectiveness will be briefly summarized in this chapter. The 1988-1991 Nez Perce Forest Monitoring and Evaluation Reports are incorporated here by reference, and the reader is referred to them for further information.

Future proposed actions for timber harvest in the Swiftwater area are reasonably foreseeable in the second decade (1998-2007) of Forest Plan implementation. Impacts of these actions cannot yet be analyzed because these actions themselves are yet to be formulated. In addition, the scheduled revision of the Forest Plan at year 10 (1998) may result in standards that are different from those now in effect. Therefore, prediction of impacts and mitigation beyond the term of this project can only be done in general terms and is necessarily speculative.

MONITORING REQUIRED

Monitoring management activities is not discretionary under NFMA; it is an integral part of all Forest plans [36 CFR 219.11(d)]. It is done on a sample basis and demonstrates any need for changes in management direction [36 CFR 219.12(k)]. Forestwide and site-specific monitoring elements are listed in Chapter V and Appendix O of the Forest Plan. Most involve mitigation; all measure progress toward the desired future condition. There are three types of monitoring:

* **Implementation Monitoring** - Used to determine if goals, objectives, standards, and management practices are implemented as detailed in the Plan.

* **Effectiveness Monitoring** - Used to determine if management practices as designed and executed are effective in meeting Forest Plan standards, goals and objectives.

* **Validation Monitoring** - Used to determine whether the data, assumptions, and coefficients used in the development of the Plan are correct.

Forest Plan standards mitigate direct, indirect, and cumulative impacts that were identified in the Forest Plan EIS. The Forest Plan monitoring program measures the effectiveness of that mitigation. This chapter discusses that process, notes any impacts of proposed activities in the Swiftwater area that are expected to be significantly different from those previously identified, and describes additional mitigation if necessary.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

This section will show the balance (trade-offs) between short-term uses and long-term productivity. It should give a clear sense of what is being "gained" or "lost" in the short and long term. For reference short-term shall be considered the forseeable future (10-15 years) and long-term shall be considered 100 years or more in the future.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section will make clear any irreversible or irretrievable commitment of resources where these terms are defined as:

Irreversible. A term that discribes the loss of future options. Applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity that are renewable only over long periods of time.

Irretrievable. A term that applies to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Although not desireable, an agency's management activities may produce adverse environmental impacts. NEPA requires that these adverse impacts be fully disclosed and analyzed; this section will disclose those impacts.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

Development of this EIS is based on direction contained in the National Forest Management Act (NFMA) and its implementing regulations at 36 CFR 219; the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations at 40 CFR 1500-1508; the National Historic Preservation Act and its accompanying regulations at 36 CFR 800; the Wild and Scenic Rivers Act, P.L. 90-542 (82 Stat. 906) and the *River Plan of the Clearwater (including the Lochsa and Selway)*, implementing the law; the Federal Water Pollution Control Act (Clean Water Act) together with regulations at 40 CFR 130; and the Clean Air Act. Also the Endangered Species Act and 50 CFR 402.12.

If any proposed activity or effects of a proposed activity are in conflict with any of the above or other law, regulation, management plan, or policy it will be stated in this section.

II. DISCUSSION OF EFFECTS TO ISSUE RELATED RESOURCES

A. Visual Quality

GENERAL INFORMATION

Impacts of timber harvest and road construction on the landscape can be pronounced, particularly when even-aged systems are used and little attention is paid to the size, shape, slope position, and silvicultural treatment of the harvest units (Forest Plan EIS, Chapter IV, p.48).

Visual Quality Objectives describe the degree of acceptable alteration of the natural landscape. The degree of alteration is measured in terms of visual contrast with the surrounding natural landscape. Visual quality objectives (VQO's) were adopted for the Upper Swiftwater analysis area as explained in Chapter Three. Below the effects of proposed activities on VQO's are displayed for each of the three sensitivity areas that were discribed in Chapter Three.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Effects Common to All Alternatives

Sensitivty Level 1 Areas- No harvest activity is proposed under any of the alternatives within this sensitivity level area. This area includes areas seen from US Hwy. 12, the Selway River Road #223, all recreation sites and private property within or adjacent to the analysis area. No timber harvest would be seen from the river corridor in any alternative.

Sensitivity Level 2 Areas- No harvest is proposed in the foreground, or adjacent, to Road #470 in any alternative. Harvest is proposed within the middle ground in the action alternatives and the effect of that harvest is described below by alternative.

Retention and Partial Retention Area- No alternative proposes harvest in these areas. The acreage within these areas will remain the same and the visual quality will only be affected by natural processes.

Alternative One- No Action

The no action alternative would have no direct effect on visual quality, as it does not propose any harvest activity or road building. Since this alternative does not propose any management activities, the current situation with the Armellaria root disease could continue to spread which, with time, would result in dead trees. To some, the sight of dead trees is unpleasent.

Alternative Two- Proposed Action

Sensitivity Level 2 Areas- No harvest is proposed adjacent to road #470. Proposed Unit #2 is approximately 300 yards off of Road #470 and will likely be visible from that road. Proposed Unit numbers 1, 3 and 6 are located in the middle ground seen area from Road #470. Approximately 115 acres would be harvested in these units, of which 75 acres would be clearcut with reserves and 40 acres seed tree harvested. This proposed harvest within the middle ground seen area is allowed and meets the VQO of Modification where management activities may dominate the landscape.

Sensitivity Level 3 Areas- All spur roads to Road #470 have a sensitivity level of 3. The remaining units in this alternative would be in these areas. Unit numbers 4, 5, 8, 9 and 10 are located in the far ground seen area from Road #470, and adjacent to 470 spur roads. Harvest on these units would be approximately 160 acres of which 120 acres would be clearcut with reserves and 40 acres seed tree harvested. As mentioned above this harvest is allowed and meets the given VQO of Modification.

Alternative Three-

Sensitivity Level 2 Areas- No harvest is proposed adjacent to road #470. A small portion of proposed Unit #7 is adjacent to Road #1119, this unit is approximately 40 acres in size and would utilize a shelterwood harvest. The shelterwood harvest would increase visual diversity of the harvested area with the residual trees. Unit numbers 1 and 6 would be within the middle ground seen area from road #470, approximately 77 acres would be harvested of which 40 would be clearcut and the remainder seed tree harvested. This proposed harvest within the middle ground seen area is allowed and meets the VQO of Modification where management activities may dominate the landscape.

Sensitivity Level 3 Areas- The remaining units, 4 and 8, in this alternative would be in this area. Approximately 60 acres would be harvested in these units, all of which would be clear cut with reserves. As mentioned above this harvest would meet the given VQO of Modification.

Alternative Four-

Sensitivity Level 2 Areas- No harvest is proposed adjacent to road #470. A small portion of proposed Unit #7 is adjacent to Road #1119, this unit is approximately 40 acres in size and would utilize a shelterwood harvest. The shelterwood harvest would increase visual diversity of the harvested area with the residual trees. Unit numbers 1, 2, 3, 6, and 12 would be within the middle ground seen area from road #470, harvesting approximately 179 acres of which 70 would be seed tree harvested and the remainder clearcut with reserves. This proposed harvest within the middle ground seen area is allowabled with the VQO of Modification where management activities may dominate the landscape.

Sensitivity Level 3 Areas- Unit numbers 4, 5, 8, 9, 10, 11, and 14 would harvest approximately 240 acres of which 160 would be clearcut with reserves, 40 acres shelterwood harvest and 40

acres seed tree harvest. As mentioned above, this harvest is acceptable given the VQO of Modification.

Alternative Five-

Sensitivity Level 2 Areas- No harvest is proposed adjacent to road #470. Proposed Unit #2 is approximately 300 yards off of Road #470 and will likely be visible from that road. Proposed unit numbers 1 and 6 are located in the middle ground seen area from Road #470. Approximately 77 acres would be harvested in these units where 37 would be clearcut with reserves and 40 acres seed tree harvested. This proposed harvest within the middle ground seen area would meet the VQO of Modification where management activities may dominate the landscape.

Sensitivity Level 3 Areas- All spur roads to Road #470 have a sensitivity level of 3. The remaining unit in this alternative would be in these areas. Unit numbers 4, 5, 8, 9 and 10 are located in the far ground seen area from Road #470, and adjacent to 470 spur roads. Harvest in these units would be approximately 160 acres of which 120 acres would be clearcut with reserves and 40 acres seed tree harvested. As mentioned above this harvest would meet the VQO of Modification.

Alternative Six- Preferred Alternative

Sensitivity Level 2 Areas- As with Alternative Five, no harvest is proposed adjacent to road #470. Proposed Unit #2 is approximately 300 yards off of Road #470 and will likely be visible from that road. Proposed unit numbers 1 and 6 are located in the middle ground seen area from Road #470. Harvest in these units would cut approximately 77 acres where 37 would be clearcut with reserves and 40 acres seed tree harvested. This proposed harvest within the middle ground seen area is allowable with the VQO of Modification where management activities may dominate the landscape.

Sensitivity Level 3 Areas- Unit numbers 4, 5, 8, 9, 10, 11, and 14 would harvest approximately 240 acres of which 160 would be clearcut with reserves, 40 acres shelterwood harvest and 40 acres seed tree harvest. As mentioned above, this harvest is acceptable given the VQO of Modification.

MITIGATION REQUIRED

Unit layout and design should minimize the visual impact of timber management as seen from the three sensitivity areas. This would be accomplished through the use of natural terrain features as unit boundaries and individually marked leave trees for riparian protection and snag recruitment would also create visual, verticle diversity.

INDIRECT AND CUMULATIVE EFFECTS

Alternative One would have no direct effect on the visual quality of the analysis area. This alternative would however, have indirect effects on the visual quality due to the possible (probable) spread of Armellaria root disease that will eventually kill trees.

The other alternatives will have direct and cumulative effects on the visual quality of the analysis area. These alternatives would **directly** alter the visual landscape with harvest activities. Harvest activities would produce open areas which may look unpleasant to some Forest visitors. The proposed harvest in connection with past harvest would create **cumulative** visual impacts where this harvest activity would create openings in addition to the existing harvested areas.

MONITORING REQUIRED

Informal, post harvest monitoring would be required to check the effectiveness of the unit layout and design mitigation required above. The Forest Plan requires monitoring visual quality objectives on 5-year intervals (Forest Plan Chapter V page 6 and Appendix O page 3).

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Timber harvest and road construction would alter the visual landscape through the removal of trees. Roads, unless obliterated, will remain treeless throughout the road's useful life. However, these roads would be used for long-term management of resources in the proximity of the Upper Swiftwater analysis area. Harvest units would have much less tree cover than before yet these trees would grow back and in approximately 30 years would become healthy young stands of conifers.

IRREVERSIBLE AND IRRETREIVABLE COMMITMENT OF RESOURCES

As mentioned above proposed roads and harvest units would have trees removed which may would impact visual quality to the extent decribed above in the short-term. The areas of harvest would be revegetated with a mixture of conifers within five years and in approximately thirty years these areas would have healthy young conifer stands. The proposed actions would be neither irreversible nor irretrevable.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Short-term adverse visual impacts can be expected with the removal of trees, the mitigation measures displayed above should minimize those impacts.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None are expected.

B. Elk Habitat

As discussed in Chapter IV of the Forest Plan EIS, road construction (pp.78-79) and timber harvest (pp.54-56) have the greatest impacts on elk habitat of any management activity. Roads can mean loss of security areas, displacement of animals, increased competition among them, and increased vulnerability to both legal and illegal hunting. Timber harvest may alter security cover, distribution patterns, and forage opportunities. These effects can be cumulative if no mitigation is applied. The Forest Plan EIS discussions cited above are incorporated here by reference, together with the technical literature used in that analysis. Additional information contained in the Uppper Swiftwater project file is incorporated here by reference, specifically the document titled "Alternative Analysis for Elk Habitat" dated December 10, 1992.

This section on effects to elk habitat is seperated into two portions; 1) Summer Range and 2) Winter Range.

1. Summer Range

GENERAL INFORMATION

Analysis of elk summer habitat effectiveness was completed for both the Lodge Point and Goddard Elk Summer Range Evaluation Areas. Analysis indicated that the current elk habitat potential was approximately 53% in the Lodge Point evaluation area and 70% in the Goddard evaluation area (refer to Chapter Three for explainations of existing elk habitat evaluations).

The principal concern for reduction in elk habitat effectiveness is associated with the loss of effective security area during hunting season. Another significant influence on elk calving areas and summer habitat effectivenss due to distribution and use of roads located through openings. Because of the influences of road access on elk summer habitat effectiveness, the following are assumptions made for the above habitat evaluations:

* Access on all roads (reconstruction or constructed for this timber sale) would be limited to timber sale purchaser vehicles and Forest Service timber sale administrative traffic.

* Timber harvest and road construction/reconstruction activities should be prohibited on road systems 1119A and 9723 between October 1 and December 15. This practice will provide for full retention of security area (i.e., no reduction in the elk habitat potential associated with a loss of security area) during hunting season.

* Timber harvest and road construction/reconstruction activities would also be prohibited on road systems 1119A and 9723 between May 15 and June 15. This would provide for protection of elk calving habitats during the peak of calving season.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

With all alternatives, a significant displacement/security area will be unaffected in the Elk City Creek watershed. All alternatives assure at least a minimum of 28% of the Lodge Point and 35% of the Goddard elk summer habitat analysis analysis units qualify as security area (irrespective of the hunting season security area that also occurs at winter range elevations) during and after active roading and logging. The table below compares the security area remaining after the implementation of each alternative.

TABLE 4.1- ESTIMATED ELK SECURITY AREA REMAINING

EHAU	EXISTING CONDITION (ACRES:%)	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6
Lodge Point	2300:32%	32%	28%	32%	32%	28%	28%
Goddard	3100:45%	45%	35%	45%	45%	35%	35%

To accommodate the concerns of the IDF&G regarding increased bull elk vulnerability during hunting season, Alternatives 1 and 3 are preferred (with Alternative 1 being the most preferred). This is because these alternatives do not involve additional roading. All alternatives assure that

elk travel corridors would remain within the study area sufficient to provide for at least current levels of elk use.

If an alternative were selected that includes harvesting units 9 & 10, all possible efforts should be made to control the timing and duration of logging disturbance to elk. Specifically, the following recommendations should be incorporated:

* Control roading and logging to be concurrent with activities on the Elkard Timber Sale. This will limit the length of disturbance elk habitat associated with logging activity on Rd 9723 (which is already under contract). In essence, get in and get out.

* Limit the roading and logging activities on units 9 & 10 to exclude May 15 - June 15 and October 1 - December 15. This will limit the impacts of logging on elk calving, elk security and hunters.

Logging outside these periods should not be restricted due to elk habitat considerations. Winter logging would be appropriate (and encouraged) because it would diminish the effects of roading and logging on elk summer range.

All action alternatives include some obliteration of new or reconstructed roads. The proposed segments are relatively short and/or within a short distance to an otherwise open road. The effects of obliterating these segments are inconsequential (not quantifiable within the elk summer range model) to achieving over-all elk summer habitat effectiveness or increasing/restoring elk security areas. Therefore, the values for elk habitat are unchanged as the result of actions to obliterate road segments.

Lodge Point Elk Habitat Analysis Unit

No significant difference between action alternatives exists. The percent habitat effectiveness, as displayed by the Elk Guidlines model, range between 53 and 54 percent, which cannot be considered significantly different given the sensitivity of the model. All alternatives meet the Forest Plan standards for elk summer range. All alternatives assure that at least 28% of this analysis unit qualifies for security area (irrespective of the hunting season security area that occurs at winter range elevations) during and after active roading and logging. All alternatives assure that elk travel corridors would be retained within the study area sufficient to provide for at least current levels of elk use.

With respect to elk summer range, Alternatives 2, 4, 5 and 6 are preferred over Alternatives 1 & 3. Alternatives 2, 4, 5 and 6 would provide for creation and distribution of additional forage areas in areas currently receiving low to negligible summer/fall elk use. Alternative 4 is the most preferred because: 1) it achieves the highest elk summer habitat effectiveness; and 2) it creates the most additional forage while prohibiting additional road access to units 9 & 10 (refer to Goddard EHAU discussion for rationale). Elk summer habitat effectiveness could reach approximately 55% after the timber sale is complete.

Goddard Elk Habitat Analysis Unit

The Goddard EHAU does not contain any proposed harvest units of the Swiftwater timber sale, it only contains one road (#9723) which provides access to units 9 and 10 of the proposed sale. This EHAU also includes the Elkard Timber Sale which is currently under contract. All roads for the Elkard Timber Sale have been constructed; logging is expected to begin in 1993. The normal operating season in which logging activities are considered appropriate for the Elkard timber sale is May 15 - October 31 (per formal contract). The normal operating season, therefore, is

inclusive of calving and general hunting season. Vehicle access on roads into the Elkard Timber Sale (Rd 9723 system) is restricted to timber harvest and Forest Service administrative traffic only.

Access on Rd 9723 to the proposed Swiftwater timber sale units 9 & 10 (with alternatives 2, 5 & 6) would be over a road already considered accessible for timber harvest in the Elkard Timber Sale. Therefore, the effects of this road respective to elk summer habitat effectiveness are already incorporated with those from the Elkard timber sale. However, the Swiftwater timber sale operating period could extend beyond the Elkard Timber Sale contract period by 2-3 years.

With all action alternatives (two through six) it will be necessary to further restrict motorized vehicle access on road 1119. The current situation on this road restricts highway vehicles yearlong. To achieve Forest Plan standards for the Goddard EHAU, it will be necessary to restrict Rd 1119 (in the Goddard Creek watershed) yearlong to all motorized vehicles. All alternatives assure that at least 35% of this analysis unit qualifies for security area (irrespective of the hunting season security area that occurs at winter range elevations) during and after active roading and logging.

Current elk summer habitat effectiveness is estimated at 70% (approximately 5% below the Forest Plan standard). Alternatives 3 and 4 exceed the Forest Plan standards for elk summer range (i.e., elk habitat effectiveness is expected to be approximately 77% with these alternatives). Alternatives 2, 5 & 6 achieve approximately 74% elk habitat effectiveness. This value is considered within the limits of modelling precision and could be considered as meeting the elk summer habitat effectiveness of 75%. With Alternatives 2, 5 & 6, elk habitat effectiveness will increase to approximately 77% after activities are complete on units 9 & 10. Again, Alternative 4 is the most preferred because it creates the most additional forage while prohibiting additional road access to units 9 & 10.

MITIGATION REQUIRED

The following items would be implemented to limit the adverse impacts to elk summer range:

1. Contract clause C5.51# - Closure to use by others. Option A will be implemented on all local roads within the Swiftwater anaysis area. This clause would not apply to roads #470 and #1119.

2. Contract clause C3.316# - Limited operating period will be implemented during Oct. 1 through Dec. 15 and May 15 through June 15. The limited operating period will apply to all timber harvest activities including road construction/reconstruction, felling, yarding and hauling of timber in proximity to road systems 1119A and 9723.

3. Following timber harvest, all local roads would be closed yearlong to motorized highway vehicles. Roads 1119A and 9723 would be closed to **all** motorized vehicles yearlong. Road 470 would remain open yearlong to all motorized vehicles and road 1119 would remain closed to all motorized yearlong with the exeption of snow machines after Dec. 15.

4. Control roading and logging to be concurrent with activities on the Elkard Timber Sale. This will limit the length of disturbance within elk habitat associated with logging activity on Rd 9723 (which is already under contract). In essence, get in and get out.

5. Limit the roading and logging activities on units 9 & 10 to exclude May 15 - June 15 and October 1 - December 15. This will limit the impacts of logging on elk calving, elk security and hunters.

INDIRECT AND CUMULATIVE EFFECTS

All action alternatives would provide some additional access to areas that have been rather inaccessible. This access may increase bull elk vulnerability

MONITORING REQUIRED

Elk are a Nez Perce Forest management indicator species (MIS), as such population trends are monitored annually as directed by [36 CFR 219.19(6) and Forest Plan, Appendix O, p.2-3.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Timber harvest activity may temporarily displace elk. Long-term productivity would be maintained and may be enhanced since elk favor small openings with abundant forage such as those created by timber management.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

A small amount of roadless habitat would be lost and the existing elk habitat condition would be changed but these impacts would not necessarily be irreversible or irretrievable over time.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Some displacement, loss of security, loss of habitat, and increased vulnerability would occur with all species. Although mitigation would reduce these impacts, it cannot eliminate them.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

No known or expected.

2. Elk Winter Range

GENERAL INFORMATION

The Upper Swiftwater analysis area currently has approximately 160 acres of winter range in forage production.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Only Alternative Two proposes to harvest timber on elk winter range. This alternative would seed tree harvest approximately 30 acres (unit # 12). This alternative would create an additional 4% of winter range forage bringing the total to approximately 24% which is beyond that which is desireable.

MITIGATION REQUIRED

The mitigation displayed in the summer range section would be also be sufficient to protect winter range. No additional mitigation would be neccessary.

MONITORING REQUIRED

Elk are a Nez Perce Forest management indicator species (MIS), as such population trends are monitored annually as directed by [36 CFR 219.19(6) and Forest Plan, Appendix O, p.2-3.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

As mentioned in Chapter Three, the Upper Swiftwater area currently has sufficient elk winter habitat for the next 15-20 years. Timber harvest in winter range would be premature and actually cause a short-fall in winter forage production sometime in the future.

Timber harvest activity may temporarily displace elk. Long-term productivity would be maintained and may be enhanced since elk favor small openings with abundant forage such as those created by timber management.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The harvest of winter range at this time would cause a short-fall in winter forage sometime in the future; this would be a irretievable commitment of winter forage resources. This action would, however be reversible with time.

A small amount of roadless habitat would be lost and the existing elk habitat condition would be changed but these impacts would not necessarily be irreversible or irretrievable over time.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Some displacement, loss of security, loss of habitat, and increased vulnerability would occur with all species. Although mitigation would reduce these impacts, it cannot eliminate them.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

The no action alternative would cause elk habitat effectiveness in the Goddard Elk Habitat Evaluation Unit to be below the Forest Plan objective of 75%. This would not be in-line with the Nez Perce Forest Plan nor would this be acceptable to Idaho Fish and Game or the Nez Perce Tribe.

C. Soils, Watershed and Fisheries

This section addresses the use of best management practices, riparian management, and soils and watershed resource improvement projects. Watershed and fisheries objectives are discussed in portions 2 and 3 of this section. These three topics are closely related so the discussion will cross between areas in this section.

1. Soils

a. Road Construction

GENERAL INFORMATION

Impacts of timber harvest and road construction on soils are discussed on pages 49, 62, and 80, Chapter IV, of the Forest Plan EIS. In summary, the Forest Plan states that soil productivity will be maintained and that soil erosion will be minimized through the application of best-

management practices (including mitigation for new actions), implementation of Forest Plan standards for riparian area management, application of fish/water quality objectives for prescription watersheds, and soil and water resource improvement projects.

Effects on soils from timber harvest and related activities can include increased erosion, increased risk of mass wasting, loss of nutrients and organic matter, and compaction or displacement of productive surface soils. Of these potential effects, compaction and displacement of soils within harvest units that have been tractor logged are the most likely to occur at levels that could result in soil conditions below Forest Plan standards.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

The tables below compare the alternatives by acres of harvest by logging system, acres of harvest by landform, and miles and type of road construction by landtype. The effects of these actions are discussed by alternative.

TABLE 4.2- MILES OF ROAD BY LANDFORM AND ALTERNATIVE

LANDFORM	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Rolling Uplands	0	2.29	1.36	1.72	2.19	2.19
Steep Mountain Slopes	0	0.20	0	0	0	0
Dissected Stream Breaklands	0	1.09	0.44	0.06	1.09	1.09
Landslide Prone	0	0.10	0	0	0	0
Totals	0	3.68	1.80	1.78	3.28	3.28

Alternative One- No Action

The no action alternative would construct no new roads, nor would it reconstruct roads for use. There would be some new soil exposure through improvement of the existing condition of roads when projects identified through watershed condition inventories and scheduled in the Swiftwater watershed are implemented. Most of these improvement projects will occur on high hazard (landslide prone) sites. Erosion would be reduced by planting, seeding and regular road maintenance. Some areas of mass movement would be stabilized, largely through planting trees. Existing road problems which are contributing to undesirable sediment increases will be improved. These scheduled watershed improvement projects are detailed in Chapter 3 under the watershed existing condition discussion.

Alternative Two- Proposed Action

This alternative proposes the most total miles of construction at 3.68 miles. The proposed access to Units 3,6,9, and 10 would be the principal causes of increases in sediment production. This alternative constructs the greatest number of miles of new roads (most new disturbance), and like Alternatives 5 and 6 has the highest number of miles of road on the dissected stream breaklands (highly erosive types). Twenty percent of all new road construction will be obliterated the same season of use under this alternative.

Alternative Three

Would reconstruct Road 1119G to access Units 6 and 7. This would pass through wet soils where road location surveys and watershed inventories indicate large amounts of sediment and surface water are currently being stored. Field reconnaissance indicates that reconstruction of this road would free a large amount of stored sediment, is extremely risky and would be very expensive.

This alternative proposes nearly the same overall miles of roading as Alternative 4 (helicopter alternative) which is the lowest proposed. However, it has more miles of new construction, which generates more sediment, and more of these miles are on more highly erosive landtypes than alternative 4. Twenty three (23%) percent of the roads constructed will be obliterated after use under this alternative.

Alternative Four

This alternative makes extensive use of helicopter yarding systems to access harvest units. New road construction is lowest under this alternative at 0.95 miles. Virtually all roading is limited to landtypes with lowered sediment production potential. Since most historical mass movement events have been associated with roads, and since this alternative has no roading on the problem landtypes, overall risk from roading is lowest under this alternative.

Alternative Five

Like Alternative 6, has the second highest number of miles of new road construction (2.45), the second highest total miles of road work (3.28), and as many miles of road construction on highly erosive landtypes as Alternatives 2 and 6 (1.09). Twenty three percent of the road miles will be obliterated after use under this alternative. This alternative is the same as Alternative 2, except it drops the extension of Road 470E into Unit 3. This reduces the predicted sediment impacts for this alternative to slightly less than Alternative 2.

Alternative Six- Preferred Alternative

This alternative would construct or reconstruct the same road package as Alternative 5. Predicted responses are the same as for Alternative 5 when effects of roading is considered.

MITIGATION REQUIRED

All road construction/reconstruction for local roads wll be mitigated to 80 percent. Non-system roads (designated temporary roads) will be mitigated to 90 percent by requiring them to be obliterated, seeded and mulched the same operating season as constructed. This will require that harvest units are completed within the same operating season as temporary road construction. Appendix B lists detailed best management practices to be used in conjunction with all road construction.

Other Direct Impacts: Under all alternatives local roads will be left in place. This will permanently remove ground from the suitable timber base. The open road prism and ditches will collect water in a different fashion than natural overland flow, resulting in lasting sediment additions to streamcourses where runoff is directed from ditching and culvert installation.

INDIRECT AND CUMULATIVE IMPACTS

Indirect Impacts: Under all action alternatives there will be changes in sediment concentrations in Swiftwater Creek due to road construction. Streamflow regimes would be altered but not significantly.

Cumulative Impacts: Past and present land management activities in the Swiftwater Creek watershed include timber harvesting/prescribed burning/reforestation, road construction/ maintenance, grazing, and watershed improvement activities.

Past activities, small landslides (natural and management induced) and incomplete implementation of mitigation measures have resulted in increased sediment loading of Swiftwater Creek. Sediment levels are currently estimated at 10 percent over baseline (natural levels). All new action alternatives will further increase the sediment levels within Swiftwater Creek. The amounts and duration of these changes are displayed under the NEZSED results by alternative. Within the decade sediment levels are predicted to slightly improve or return to existing condition levels.

Road densities within the watershed will increase as a result of all action alternatives.

There will be additional risk of failure of roads (major landslope processes) through implementation of any of the new action alternatives. Although past experience has shown these occurrences to have a low probability of occurring, it stands to reason that this probability will increase in relation to increases in road miles on landtypes prone to these events. In addition, as activities increase in other drainages, the liklihood of multiple events occurring at the same time increases. This could result in large discharges of sediments and large woody materials affecting areas well downstream of the project area.

MONITORING REQUIRED

The Forest Plan requires that mitigation measures used to mitigate for the impacts of transportation facilities on resources be monitored to assure implementation has occurred. (Forest Plan Chapter V-7, and Appendix O, page 16).

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

The short-term use (construction of roads and timber harvest) could have an adverse effect on the long-term productivity of the land. The soils would be affected by excavation, displacement, erosion, and compaction. These effects would remain evident for a long time even when the area is closed to further use.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Once roads are constructed, maintenance is reasonably foreseeable. Soil productivity lost is irretrievable.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

The negative impacts on soils from construction and maintenance of roads can be minimized but not avoided.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

No conflicts with other land management plans are likely to occur.

b. Harvest Activities

COMPARISION OF ALTERNATIVES

TABLE 4.3- ACRES OF HARVEST BY LOGGING SYSTEM AND ALTERNATIVE

SYSTEM	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Tractor	0	34	0	34	34	34
Skyline	0	275	177	97	237	237
Helicopter	0	0	0	328	0	80
TOTALS	**0**	**309**	**177**	**459**	**271**	**351**

TABLE 4.4- ACRES OF HARVEST BY LANDFORM AND ALTERNATIVE

LAND-FORM	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Rolling Uplands	0	86	37	93.5	86	86
Steep Mountain Slopes	0	61	23	83.5	23	23
Dissected Stream Breaklands	0	162	117	282	162	242
TOTALS	0	309	177	459	271	351

Alternative One- No Action

Recent burns would continue to revegetate and large woody debris on these upland sites would continue to decay, improving the soil conditions on these sites. Harvest units and riparian areas will be reforested. Where past activites have resulted in degraded conditions and are affecting water quality required reforestation efforts and regeneration exams will continue until stocking is attained.

Alternative Two- Proposed Action

This alternative proposes 309 acres for harvest (34 acres of tractor and 275 acres of skyline). The majority of the proposed harvest acres are in dissected stream breaklands which have a high erosion potential. Since all of the access to these units is by road (roads producing most of the sediment), and since this alternative proposes the greatest number of acres harvested under conventional systems (these systems more site disturbing than helicopter systems), this alternative has the highest predicted impacts from sediment. Alternatives 4 and 6 propose more acres for harvest, but some of these are yarded by helicopter systems which reduces predicted sediment production. The extension of Road 470 to reach Unit 3, and subsequent harvest of this unit, account for the expected increase in sediment production of this alternative over alternatives 5 and 6 which have the second highest sediment production.

Alternative Three

This alternative proposes the fewest acres for harvest of any alternative while proposing the fewest acres for harvest in each landtype. This alternative has the lowest impacts, of the action alternatives, on fish/water quality due to there being no tractor units (most site disturbing) and fewer acres proposed overall (less total activity). All of the units would be yarded with skyline systems (moderately site disturbing). Although this alternative proposes to harvest the fewest acres of any action alternative at 177 acres, this alternative proposes to harvest Units 1, 6, and 7 which are on highly erosive landtypes and closely aligned with sensitive riparian areas.

Alternative Four

Alternative four proposes to harvest the greatest number of acres of all the alternatives at 459 acres. The majority of the proposed harvest acres are in dissected stream breaklands which have a high erosion potential. With 282 acres proposed in these breaklands this alternative

would harvest more on these landtypes than any other alternative. However, by proposing extensive use of helicopter yarding systems, this alternative would limit ground disturbance and result in projected impacts similar to that of Alternative 3. This alternative proposes to tractor yard 34 acres, skyline yard 97 acres and helicopter yard 328 acres. This alternative proposes to harvest Units 1, 6, and 7, which are on highly erosive landtypes. The use of helicopter yarding in Units 6 and 7 would limit eliminate roading and reduce ground disturbance resulting in less sediment production. The sediment model does not predict large overall increases in sediment delivery from this alternative because the yarding system has a low impact. However, the model does not consider landslide potential or risk in its calculations. Under this alternative there would be more risk taken with harvest on highly erosive landtypes. When difficulties with access are considered for prescribed burning, and one considers the potential long term effects, risk increases. This alternative has no new road construction on highly dissected stream breaklands, while taking more risk with harvest on these landtypes. Since most landslide events have been associated with roading, overall risk is believed to be lowest, of the action alternatives, under this alternative.

Alternative Five

Alternative 5 differs from Alternative 2 by dropping Unit 3. It drops this unit and the harvest of 38 acres in steep mountain slopes landtypes. It would harvest 34 acres utilizing tractor yarding systems and 237 acres with skyline systems. This alternative harvests the same number of acres as Alternative 2 on steep, dissected stream breaklands.

Alternative Six- Preferred Alternative

This alternative is similar to Alternative Five. It harvests all units proposed under Alternative Five but adds two units totaling 80 acres on highly erosive, and potentially unstable dissected stream breaklands. These are accessed via helicopter eliminating the need to construct roads. Since less risk would be taken than when roading through these landtypes, and since most mass failures have been associated with the roads, these units are added without addition of much more risk. Again, the increase in projected impacts over Alternative 5 is immeasurable with the NEZSED model.

MITIGATION REQUIRED

The District Silviculturist has specified logging systems, season of activity, cutting system and method of regeneration for each harvest unit to mitigate adverse impacts to site productivity and limit ground disturbance. On ground review has identified riparian areas and unit layout has mitigated for harvest impacts to these areas. Prescribed fire plans will mitigate for fire effects to harvested units.

INDIRECT AND CUMULATIVE EFFECTS

Indirect:

There will be increases in water yield from the clearcut harvesting of units within the Swiftwater Timber Sale. This will be more significant in downstream areas as the combined effects from many different units will be more concentrated there. Water yield increases will fluctuate with the season and will vary based on the difference in annual weather patterns. Varying depths of snowpack and a range in spring weather patterns (rainfall and temperatures), would result in widely varying indirect effects due to water yield. The overall effect on water yield is predicted to be below that required to result in negative changes to the stream channel morphology.

However, natural events alone could result in channel morphological changes, and at this time these could become more significant as a result of clearcutting.

Cumulative:

Additional clearcut harvesting will increase the equivalent clearcut area of the Swiftwater watershed. Past clearcuts are recovering as will the new units. However, this recovery rate is dependent on survival of trees planted after harvesting, and natural events can effect this through drought, freezing or infestation. The additional acreage proposed under all alternatives will result in a predicted level of equivalent clearcut which is not predicted to result in cumulative negative changes to stream channel function even without recovery. However, reforestation is required under Federal law and will be achieved.

MONITORING REQUIRED

Reforestation will be accomplished on all harvested acres. This will be monitored through standard regeneration examinations. This are done the first,third and fifth years after harvest. If the units are not certified as restocked after this time, the process will continue until regeneration is accomplished.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Timber harvest in the Swiftwater area provides an opportunity to improve long-term timber productivity by replacing existing stands with new, faster growing stands. While providing for the immediate and long-term needs of the beneficial uses of the riparian resources, timber productivity in riparian areas would not be maintained due to lengthened rotation required by deferring harvest.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Forested sites committed to roads and landings would be taken out of productivity. Riparian areas deferred from harvest may never be harvested.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

None anticipated.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

No conflicts with other land management plans are likely to occur.

2. Watershed

Unmitigated impacts of sediment on fish habitat can be severe and long-lasting. Many years may be required for a stream to flush itself naturally. In general, as sediment yield increases, fish habitat potential decreases (Forest Plan EIS, Chapter II, p. 125). Excess sediment in stream channels reduces water flow to developing fry, blocks fry emergence from spawning gravels, destroys food organisms, and fills in summer and winter rearing habitat (Stowell, et. al.,1983). Impacts vary by the miles of road constructed, silvicultural methods used, the season of activity, soil and geological types, steepness of slopes, and mitigation applied (Megahan and Kidd, 1972).

The sediment yield and entry frequency guidelines defined by the Forest Plan address only sediment production and mitigation. While this may be the most significant link between fish habitat, water quality, timber harvest, and road construction, there is more to water quality than just the fish habitat components. Other water quality features include water temperatures, turbidity, pH, and alkalinity.

The discussion of effects to the watershed within the Upper Swiftwater analysis area has been seperated into three areas 1) Riparian Areas; 2) Water Yield; and 3) Sediment Predictions.

a. Riparian Areas

GENERAL INFORMATION

Riparian areas include those lands within a minimum 100 horizontal feet of the high water line of any perennial stream and 50 horizontal feet of the high water line of any intermittent stream; together with wet meadows, bogs, and some alder glades. High soil moisture is the norm; the actual width of riparian areas varies with vegetation type and valley bottom width.

Although all riparian areas are included in Forest Plan Management Area 10, all of this management area may not be shown accurately on the management area map because of problems of scale. Therefore, for the purpose of this analysis, 100 feet on either side of perennial streams and 50 feet on either side of intermittent streams is assumed to be riparian.

A tool used in determining the extent of the riparian areas is the Federal Manual for Identifying and Delineating Jurisdictional Wetlands. This document was jointly produced by the Army Corps of Engineers, Environmental Protection Agency, Soil Conservation Service, and Fish and Wildlife Service. The document can be used to determine whether an area is a jurisdictional wetland, to delineate the upper boundary of those wetlands, or to identify vegetated wetlands for the National Wetlands Inventory, the current mapping system on the Forest. These areas are routinely added to through on the ground inventories, so this process is constantly updating the Wetlands Inventory Maps.

Riparian ecosystems are intricate and easily damaged. Impacts of timber harvest on riparian-dependent fish and wildlife species are discussed on page 51, Chapter IV of the Forest Plan EIS. In general, the most significant adverse impacts would be total or near-total removal of tree cover and drastic alteration of stream channels. These impacts would be direct (on the site), indirect (on downstream habitat), and cumulative (along with past actions current activities might result in decades being required for the riparian ecosystem to restore itself).

Forest Plan standards (Chapter II, p.22) require that in any otherwise unresolvable conflicts, preference will be given to the riparian-area dependent resources.

Management Area 10 standards (Forest Plan, Chapter III, pp.31-32) establish logging and road construction practices that will protect the riparian resource values. These standards and guidelines will apply with implemention of any of the action alternatives.

Impacts of management activities on riparian areas are monitored annually through administrative field reviews (Forest Plan, Appendix O, p.15). Compliance with Idaho Water Quality Standards in riparian areas, as described in the previous section of this document, is checked in timber sale audits conducted by the Idaho Department of Health and Welfare.

COMPARISION OF ALTERNATIVES

All Alternatives would maintain the existing conditions. Following the specific mitigation measures proposed for this timber sale, all riparian areas were mapped out. During unit layout, these preliminary boundaries were ground truthed. Marking guidelines developed by the District Silviculturist (utilizing IDT input) was to exclude all known riparian areas from all harvest units. Proposed new road locations were overlayed against the National Wetlands Inventory and then surveyed on the ground. No known riparian areas will be affected by the new road construction. There are no major stream crossings scheduled under new construction. There will be improvements made to existing road segments which have resulted in permanent losses of riparian acres in the past.

MITIGATION REQUIRED

Well defined riparian areas will be identified prior to activities and will be avoided during road construction and harvest. Small, isolated riparian areas occuring within harvest units will be avoided where possible. Where avoidance is not possible due to constraints such as logging systems conflicts, marking is prescribed as mitigation to avoid negative impacts to the riparian areas. Trees are marked to provide for such things as channel stability, shade or large woody debris inputs.

Other Direct Effects: There is no planned harvest in any riparian area. There may be problems with administration or subsequent blowdown of riparian leave areas. These areas are expected to be small and insignificant in terms of overall riparian function. It is not expected that there would be any significant direct effects.

INDIRECT AND CUMULATIVE EFFECTS

Indirect: Because no direct effects are anticipated there should also be no indirect effects.

Cumulative: Existing riparian areas have been harvested. There are numerous first order streams where riparian function has been impaired and where regeneration has not yet occurred. Some of these are resulting in increased water temperatures and increased sediment delivery. No further impacts to riparian areas is planned under any of the action alternatives. Riparian areas have been avoided in all alternatives. However, planning does not preclude the occurrence of natural events of large scale like blowdown or large rain on snow events. In the event that riparian leave areas experience catastrophic events, then there could be some cumulative impairment to watershed function. The risk of this is slight when compared with removal or harvest in these areas concurrent with the proposed actions.

MONITORING REQUIRED

The timber sale administrator and other resource specialists will report on implementation effectiveness of the prescription to avoid riparian areas. Effectiveness monitoring will occur post harvest for a number of years as the effectiveness of these riparian leave areas is evaluated.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

The short-term use (timber harvest) would be excluded in riparian areas so that long-term productivity of fish habitat (riparian-dependent resources) is not impaired by detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment, and so that cover and security for dependent species are maintained.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Roads and stream crossings in riparian areas constitute an irretrievable loss of riparian habitat as long as the roads are in place.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Adverse impacts from road construction and timber harvest in or immediately adjacent to riparian areas can be mitigated but not completely eliminated. There will be sediment produced from road segments which will enter riparian areas, and harvesting will open up canopies near riparian areas which increases the liklihood of blowdown of riparian timber.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

No conflicts with other land management plans, policies and controls are likely to occur as a result of management practices on the riparian resources.

b. Water Yield

GENERAL INFORMATION

Predictive models are available which estimate the effects of silvicultural activities on water yield, but these models are not currently in use on the Nez Perce Forest. On the Nez Perce National Forest, the sediment model was found to be a more restrictive activity scheduling tool than the water yield in most watersheds. For this reason, no guidelines for water yield increase were included in the Forest Plan. Increase in water yield may be a concern in watersheds where a high percentage of the natural vegetation as been removed, especially if rain-on-snow influences or glaciated soils are present.

Since there is not a predictive water yield model in use at this time, equivalent clearcut area (introduced in Chapter 3) is addressed here in order to answer concerns from reviewers of recent Forest environmental documents about potential effects of water yield on watershed function. The relationship between the percentage of a watershed harvested, and the likelihood of negative effects is examined.

TABLE 4.5- EQUIVALENT CLEARCUT AREA BY ALTERNATIVE

ALT	Har. Ac. = CC	Road Ac. = CC	Total Ac. = CC	(Ext + AL) = CC	Watershed Acres	% Watershed = CC
1	307	75	382	382	3933	10
2	309	18	327	709	3933	18
3	177	9	186	568	3933	14
4	459	7	466	848	3933	22
5	311	16	327	709	3933	18
6	351	16	367	749	3933	19

Harvest acres shown in column 1 are the total acres which would be harvested under a clearcut prescription under the alternatives. These acres will decrease over time through regeneration. Road acres in column 2 are the number of acres which would be changed from timber to open road surface as a result of road construction. These acres will not recover over time as they are permanently dedicated to the road system. Total acres as clearcut in column 3 is derived by adding columns 1 and 2. When the total acres harvested to date in the Swiftwater watershed were adjusted to account for recovery (regrowth of trees and canopy) a total of 382 acres remains in equivalent clearcut status. This figure is added to the acreages resulting from implementation of each alternative. This total is displayed in column 5. Column 6 relects the size of the watershed in acres. Column 7 isderived from dividing the anticipated total of acres in equivalent clearcut area (column 5) by column 6.

COMPARISION OF ALTERNATIVES

Alternative 1 would not harvest any timber. There would be no increase in net equivalent clearcut acres from selection of this alternative. The ten percent of the watershed currently existing as equivalent clearcut would continue to recover (add canopy) resulting in a steady decrease in equivalent clearcut acres overtime.

Alternatives 2 and 5 would result in the same increases in equivalent clearcut area, up to 18 percent from the existing condition of 10 percent. Since Alternative 2 proposes slightly more road there would be less recovery over time, since the road prism would not be removed nor would it regrow its tree cover. Both alternatives result in a total watershed percentage in clearcut that should not have an incremental effect on water yields that would result in any stream channel degradation.

Alternative 3 would have the least increase in equivalent clearcut area, and hence the least increase in its effect on water yield. It would raise the percent of the watershed in clearcut area by only 4 percent over existing.

Alternative 4 while constructing the least amount of new road, harvests the most acres and would result in an equivalent clearcut area greater than any other alternative. At 22 percent of the watershed this alternative begins to approach the level where increases in water yields could result in negative changes in stream channel morphology, especially if some type of large natural runoff were to occur.

Alternative 6 has the second highest predicted increase in equivalent clearcut area, though its effects are nearly the same as Alternatives 2 and 5. At 19 percent of the watershed, this should not result in water yields that would effect stream channels in a negative way.

MITIGATION REQUIRED

When the percentage of a watershed in equivalent clearcut area approaches one quarter (25%) to one third (33%) it is generally agreed that changes could occur in stream channel morphology; there could be channel degradation, bank cutting, increased sediment deposition in the stream channel, etc. No alternative proposed exceeds 22 percent, while the preferred alternative proposes an increase to 19 percent. Oftentimes during harvest of the units, it is discovered that during the logging systems planning phase some details have been missed. Generally, this is caused by some natural feature that does not allow a cable system to operate properly. Manytimes the unit size will be increased to achieve proper deflection or angle. To assure that equivalent clearcut area does not exceed that of the selected alternative, these small changes in acreage, if deemed necessary, will be tracked to assure that they don't allow an increase in the percentage of the watershed in equivalent clearcut area.

Other Direct Effects: All alternatives result in increases in water yield, but all are within generally recognized limits that should not result in any decreases in channel stability, downcutting or sediment production.

INDIRECT AND CUMULATIVE EFFECTS

Indirect: There should be increases in water yield during peak flows downstream of the proposed actions. These effects should not have negative consequences on any of the habitat components required to protect beneficial uses, in this case steelhead and domestic water.

Cumulative Effects: When added to the past actions, all action alternatives result in increases in the equivalent area in clearcut status. Since the number of acres are proposed for harvest keeps increases within generally recognized limits, there should be no net negative cumulative change associated with implementation of any action alternative. The units proposed in these alternatives all lay on easterly or northerly aspects which present the least difficulty in regenerating. Furthermore the landtypes present in the proposed project area are of a type that regenerate well, especially on the aspects units are proposed on. Recovery of the canopy for rain and snow interception in these areas through regeneration of its conifer stand should be steady over the short term, and as a result cumulative effects should not be long term. These effects should not have negative consequences on any of the habitat components required to protect beneficial uses, in this case steelhead and domestic water.

MONITORING REQUIRED - Standard reforestation regeneration exams would track development of the new forest stand and report the time it is classified as restocked and at what rate. These occur the first, third and fifth years after harvest.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Short-term use (harvest and creation of openings) may effect water yields. The effects are minimized by the amount of the activity proposed and should not result in any negative long-term trend.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None anticipated as recovery of timber stands will occur quickly in the short-term. The aspects and soil types found in the project area are of types known not to have regeneration/ revegetation difficulties.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

None anticipated.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None are indicated.

c. Sediment Predictions

GENERAL INFORMATION

Predictive models are used to determine if streams will meet objectives under future management. The most commonly applied models to evaluate water quality and fish habitat on the Nez

Perce national Forest are NEZSED and FISHSED. These models predict effects of management on sediment yield, deposition, and fish habitat. Equations have been developed which relate predicted sediment yield to effects on habitat. The sediment yield and entry frequency guidelines displayed in Appendix A to the Plan show the degree of sediment yield increase which should not be exceeded in order to maintain a specified fish/water quality objective. This applies to sediment alone, and does not attempt to account for the other habitat variables that make up the overall objective.

Assumptions used in modeling sedimentation are included in the Project File. In general however, activities were concentrated in time to estimate maximum effects. NEZSED uses information on miles of road by landform and slope position, and on acres of harvest units by landform and silvicultural treatment. It uses information on soil types and stream reaches to predict overall sediment production. It also predicts sediment production under different levels of mitigation. The minimum mitigation required is that which is necessary to bring a project within the established fish/water quality objectives for the affected drainages.

To project the anticipated effects of proposed activities in a prescription watershed, the NEZSED model adds the above information to inventoried data concerning the existing condition of the watershed. All previous activities in the watershed; road construction, harvesting, prescribed fires, and any watershed improvement projects are included in the report of the existing situation for the watershed. For this analysis, the existing condition of Swiftwater Creek is 11 percent over its natural baseline. The sediment decrease to 10 percent overbase shown for the No Action Alternative (Alternative 1) is a result of implementation of scheduled watershed improvement projects which will occur in Swiftwater Creek with or without a decision on the currently proposed timber sale.

Forest Plan standards (Chapter II, p.25) specify that all road systems will be designed to mitigate at least 60 percent of the predicted sediment. This standard is exceeded in all alternatives. On all local roads and timber harvest units, 80 percent of the potential sediment is predicted to be mitigated. On non-system temporary roads mitigation is predicted at 90 percent. (To achieve 90 percent mitigation a road must be constructed to low standard levels, all harvest and hauling must occur, then the road must be obliterated/seeded/mulched during the same season as use.) These requirements are expected to reduce stream recovery time.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Predicted sediment increases are significantly less than the allowable displayed for this watershed in Appendix A of the Forest Plan. This is the second entry this decade in this watershed, again allowable by Forest Plan standards. It is the final planned entry this decade.

TABLE 4.6- NEZSED OUTPUTS REPORTED AS % OVER BASE

ALT.	WATERSHED MANAGEMENT OBJECTIVE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
	EXISTING CONDITION	11	11	11	11	11	11	11	11	11	11
1	(2-45%)	10	10	10	10	10	10	10	10	10	10
2	(2-45%)	31	16	12	12	11	11	11	11	11	11
3	(2-45%)	19	13	11	11	10	10	10	10	10	10
4	(2-45%)	19	13	12	11	11	10	10	10	10	10
5	(2-45%)	28	15	12	12	11	11	11	11	11	11
6	(2-45%)	28	16	12	12	11	11	11	11	11	11

Testing of the NEZSED model with the Horse Creek watershed has indicated that the model may overpredict peak year sediment rates and underpredict long term recovery. What this means is that it is likely that short term effects (peak year preditions) are not as great as displayed, but that recovery may be delayed longer than shown. The general range of model sensitivity is 10 percent. Changes less than this may not be significant.

Alternative 1: Alternative 1 is a no new action alternative. There would be no new road construction/reconstruction or harvest activities. There would be required mitigation which has been listed in Chapter 3. Direct effects of implementation of this alternative would be confined to decreases in sediment production from existing closed roads and harvest units. There would be a predicted decrease in the sediment over baseline of about 1 percent.

Alternative 2: This alternative predicts the greatest single year increase in sediment production of any action alternative at 31 percent. This predicted value is below the allowable increase of 45 percent. Along with Alternatives 4, 5 and 6, this alternative predicts that sediment would be back to the same levels as the exisitng condition by year five after implementation.

Alternatives 3 and 4: These alternatives predict the single lowest peak in sediment production at 19 percent overbase. By year three and four,respectively, after implementation these alternatives are predicted to return to existing levels. Alternative 4 shows a slightly slower recovery time than Alternative 3 due to the much greater number of acres harvested. The lack of road construction is the reason these two alternatives generate less sediment.

Alternatives 5 and 6: These alternatives have virtually the same effects in sediment production. While they have the second highest level of sediment predicted, their predicted effects do not vary significantly from Alternative 2. Alternative 6 has a slightly slower recovery than Alternative 5 due to harvesting more acres on erosive landtypes. Alternatives 2, 5 and 6 are predicted to return to existing levels by year five after activities.

MITIGATION REQUIRED

Watershed rehabilitation work identified during watershed condition inventories and listed on the following page would be required to be completed. These projects are largely associated

with past activities from the last entry. They are required to bring current mitigation on the roads and harvest units into line with the 80 percent mitigation that was claimed during the last entry. At this time, mitigation has been reviewed and it is felt that a 70 percent level reflects existing condition on these areas. New construction which is modeled at 80 percent must be achieved during project implementation. Road construction contracts and road maintainance will be monitored to assure compliance with the 80 percent mitigation requirements.

The projects displayed in the following table were identified by field personnel as needed for watershed improvement and assurence of upward trend. These projects have been input into the District's Watershed Improvement Data Base (WIPDB) for prescription watershed 17060302-01-24 (Swiftwater Creek).

TABLE 4.7 - WATERSHED IMPROVEMENT PROJECTS REQUIRED FOR MITIGATION

PROJECT #	LOCATION	SOURCE	LANDTYPE	PRIORITY*
702	SW 1/4 SEC 17 Road #470D1	Mass erosion Rotational Slump	31D48 31D48	2 1
703	SE 1/4 SEC 17	Mass erosion	50CUU	2
704	NW 1/4 SEC 16	Mass erosion	50EUU	2
705	NW 1/4 SEC 16	Channel Erosion	50EUU	2
706	NW 1/4 SEC 16	Channel Erosion	50EUU	2
707	NE 1/4 SEC 17	Fireline Erosion	31D38	2
708	Road #470D	Cutslope failure	50CUU	1
709	Road #470B	Rotational Slump Culvert failure	50EUU 50EUU	2 1
710	Road #470C	Cutslope failure	50EUU	1
711	Road #470D1	Cutslope failure Crossdrain failure Culvert failures-17	50CUU	1 1 1
712	Road #470E	Culvert failure Crossdrain failure	50CUU	1 1
713	Road #470E	Ponding water	50CUU	1
715	SE 1/4 SEC 24	Streambank Bank Erosion	31D48	3
716	SE 1/4 SEC 24	Streambank Bank Erosion	31D48	3
717	NE 1/4 SEC 19	Streambank Bank Erosion	31D48	3
718	NE 1/4 SEC 19	Streambank Bank Erosion	31D38	3
719	SE 1/4 SEC 17	Streambank Bank Erosion	61E48	3
720	NE 1/4 SEC 19	Streambank Bank Erosion	31D48	3

* PRIORITY has been given to indicate which projects should be completed first where priority 1 projects should be completed prior to timber sale activities; priority 2 projects should be completed during project implementation; and priority 3 projects could be completed at any point prior to the close of the timber sale contract.

INDIRECT AND CUMULATIVE EFFECTS

All alternatives except Alternative 1 would result in increases in the amount of sediment produced over baseline. These direct effects would be well below established thresholds for sediment production, and would not result in long-term indirect or cumulative impacts to Swiftwater Creek or the Selway River.

MONITORING REQUIRED

Table 4.11 displays the required monitoring elements. In the past required mitigation has not always been obtained. Assurance that it will should be provided through annual monitoring reports.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

The proposed timber sale and its short-term effects should not result in any long-term decreases in the productivity of Swiftwater Creek given full implementation of the required mitigation.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

There will be increases in sediment levels in Swiftwater Creek. Since these increases are predicted to fall well below the allowable amounts, they are not expected to result in any long-term effects to fish habitat or domestic water use. Predictive models indicate that recovery to existing levels should occur in approximately 5 years; calibration of the model suggests this may take slightly longer. The trend in all fish habitat components except sediment are expected to be continuously upward.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None.

3. Fisheries

Information regarding effects to specific fish species can be found on pages 42-47 of this chapter.

Fish/water quality objectives have been assigned for all nonwilderness prescription watersheds on the Forest. These objectives range from 70 to 100 percent of fish habitat potential. Sediment yield and entry frequency guidelines are also established for meeting these objectives at the project level.

The existing condition of the fish habitat in Swiftwater Creek and affected by the proposed action and alternatives was summarized in Chapter Three (Table 3.4: *Habitat Variable Analysis Table*). The optimum ratings for Swiftwater Creek are fish habitat parameters identified in surveys from various streams within the Clearwater River Basin, representing an approximation of the stream's optimum natural potential.

The existing ratings for Swiftwater Creek result from measuring the fisheries habitat in this prescription watershed using the Nez Perce Basinwide Stream Survey Methodology (Lanigan, 1989). The "% optimum" ratings compare surveyed results (existing condition) to the optimum (100 percent DFC Table conditions).

The Habitat Components Rating Table (Chapter Three, Table 3.5) shows a combination of fish habitat parameters associated with summer, winter, spawning and riparian needs. This table provides a means of addressing limiting factors so that the fish/water quality objectives for each watershed can be met. The components that make up the habitat are listed by channel types (Rosgen, 1988).

Predictive models are used to determine if streams will meet objectives under future management. The most commonly applied models to evaluate water quality and fish habitat on the Nez Perce National Forest are NEZSED and FISHSED. These models predict effects of timber harvest and road construction on sediment yield, deposition, and fish habitat. Equations have been developed which relate predicted sediment yield to effects on habitat.

The sediment yield guidelines displayed in Table 4.8 shows the degree of sediment yield increase and the number of entries which should not be exceeded in any decade in order to meet Forest Plan specified fish/water quality objectives for Swiftwater Creek.

TABLE 4.8- FISH/WATER QUALITY OBJECTIVES - SWIFTWATER CREEK

STREAM	INDICATOR SPECIES	FISH/WATER QUAL. OBJ	SEDIMENT YIELD GUIDELINE	# ENTRIES/ DECADE
Swiftwater	Steelhead	80%	<45%	2

The above guidelines apply only to sediment and do not attempt to account for the other habitat variables that make up the overall objective. The sediment yield guideline is expressed as a percentage increase over baseline conditions. This guideline is keyed to sediment yield predicted to occur after the first year of an activity. These guidelines were developed with the current condition of the watersheds being considered. Swiftwater was considered to be at 100 percent of its objective (see Forest Plan Appendix A). This is now known not to be the case. Therefore, allowable sediment rates and entrys need to be examined in light of the predicted upward trend.

a. FISHSED

GENERAL INFORMATION

The FISHSED computer program uses the equations described in *Guide for Predicting Salmonid Response to Sediment Yields in Idaho Batholith Watersheds* (Stowell et al, 1983) to predict the effects of sediment yield on fish habitat.

FISHSED utilizes the peak year sediment predictions from the NEZSED model in making these predictions. Since calibration of the NEZSED model has indicated peak year sediment production may be overestimated, there is the possibility that in using these values FISHSED is slightly overstating effects on fish habitat capability. Information on pristine habitat (cobble embeddedness and percent fines by channel type) from the DFC tables and existing conditions (cobble embeddedness) from the basinwide survey enter into the calculations as well.

FISHSED allows the user to analyze a series of disturbances that may affect sediment yield and deposition, called "entries" in the program. In this section, disturbance and entry are used interchangeably.

FISHSED displays fish density as fish/m^2 for "pristine" conditions, then displays fish density and percent of pristine for "existing" and "after entry" conditions.

By dividing "after entry" figures by "existing", the percent decline in habitat potential is calculated for each alternative by channel type. These values are displayed in Tables 4.9

Model outputs are reasonable estimates not absolute numbers of high statistical precision. The capability of the FISHSED model in analyzing and displaying change at the levels shown in Table 4.8 is very limited. "Significant" changes are considered to begin at about a 10 percent change in habitat quality. In this case, the data from FISHSED is most useful as a comparative tool in evaluating the relative effects of implementing the various alternatives. However, results obtained must be used in combination with sound biological judgement. All action alternatives are predicted to result in non-substantial changes in habitat quality; resulting in projected levels of change which are well below the precision of the model. The Forest Fisheries Biologist and Forest Hydrologist have determined that these levels of change, coupled with the prescribed mitigation measures and improvements, would maintain an upward trend in Swiftwater Creek.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Table 4.9 displays the FISHSED model predictions of decline in fish habitat capacity which would result through implementation of the various alternatives. The percent change is derived from the decrease in the percent of pristine as a result of the action alternatives.

TABLE 4.9- PERCENT DECLINE IN FISH CAPACITY FROM EXISTING

ALTERNATIVE	CHANNEL TYPE	SUMMER FISH	WINTER STEELHEAD	WINTER CUTTHROAT
1	A B	0 0	0 0	0 0
2	A B	2-4 1-3	2 6	2-3 4-6
3	A B	1-2 1-2	1 4	1-2 2-3
4	A B	1-2 1-2	1 4	1-2 2-3
5	A B	2-3 1-3	2 6	2-3 3-5
6	A B	2-4 1-3	3 6	2-3 3-5

Summer Fish refers to age 0 and age 1 summer rearing capacity for all species combined.

Winter Steelhead refers to age 0 winter rearing capacity for steelhead alone.

Winter Cutthroat refers to age 0 and age 1 to 2 winter rearing capacity for cutthroat trout.

Since it appears likely that NEZSED overpredicts peak year sediment rates, and FISHSED uses these figures to calculate the change in fish habitat capability it is likely that the magnitude of change displayed in Table 4.8 is greater than actual. The predicted changes remain so slight as to be unmeasureable.

Alternative One proposes no new activity and would not preclude needed and scheduled watershed improvement projects identified in Table 4.7. Current conditions would be improved through reduction of sediment inputs. Since no new sediment from management activities would be added, there would be no lag in upward trend (see Upward Trend discussion page 4-29) in sediment or habitat capacity.

Alternatives Two, Five and Six would have nearly identical effects in changing fish habitat capacity from existing conditions. Alternatives 5 and 6 have the same roading package, and harvest virtually the same units. Alternative 6 adds two helicopter units accounting for a minor increase in effects over Alternative 5. Winter steelhead capacity is predicted to be reduced 6 percent from existing within the B channel reach in these alternatives. This comes the closest among any of the alternatives and channel types to approaching a significant level (10 percent), of habitat reduction. Since Alternative 2 proposes the most road construction or reconstruction, 3.68 miles it is expected that in reality its effects would be slightly greater than either Alternatives 5 or 6, especially since portions of the new construction are in landtypes which yield significant amounts of sediment upon disturbance. Effects on summer fish rearing and winter cutthroat are similar among these three alternatives.

Alternatives Three and Four have identical predicted effects. However, Alternative 3 should have the most minor impacts to fish habitat capacity of these two because it proposes to harvest far fewer acres overall. Reconstruction of the existing road to access Units 6 and 7 would require extensive work in very wet soils. Watershed inventories conducted in June and July 1991 found that this old road contains many seeps and springs, and is storing significant amounts of fine sediments. Road reconstruction and timber harvesting would be expected to produce more sediment than predicted by NEZSED. Alternative 4 is predicted to have exactly the same decrease in fish capacity as Alternative 3 while harvesting 282 more acres, an increase of over 2.5 times. Restricting road construction and reconstruction to more stable landtypes and using helicopter yarding systems would limit potential sediment production. This alternative would also harvest Units 1, 6, and 7 which include significant riparian acreages. Helicopter yarding of units 6 and 7 would result in less sediment production from these areas than the proposed road reconstruction and skyline yarding of Alternative 3.

MITIGATION REQUIRED

The Forest Service is required by law to comply with water quality standards developed under authority of the Clean Water Act. Both the Environmental Protection Agency and the State of Idaho are responsible for enforcement of these standards. The Nez Perce Forest Plan states (Chapter II, p. 21) that the Forest will "apply State water quality standards and Best Management Practices to land-disturbing activities to ensure that State water quality standards are met or exceeded...projects that will not meet State water quality standards shall be redesigned, rescheduled, or dropped."

Idaho water quality standards require the use of Best Management Practices (BMPs) to mitigate nonpoint pollution. State-recognized BMPs that would be used during project design and implementation are contained in these documents:

* **Idaho Forest Practices Rules**, as adopted by the Idaho Land Board;

* **Rules and Regulations and Minimum Standards for Stream Channel Alterations**, as adopted by the Idaho Water Resources Board;

* **Best Management Practices for Road Activities**, as agreed upon between the Forest Service and the State of Idaho.

BMP formulation, adoption, and evaluation are constantly evolving. The Nez Perce Forest is a participant in this process. Compliance with all present BMPs is affirmed through project planning, provisions in Divisions B and C of timber sale contracts, Special Project Specifications in road construction contracts, and Forest Plan Standards for timber management and road construction.

The Forest Service Soil and Water Conservation Practices Handbook (FSH 2509.22) guides interdisciplinary development of BMPs in project design. The BMPs listed in Appendix B of this DEIS are referenced to the Practices listed in the Handbook. All rules contained in Chapters 3 (Timber Harvesting) and 4 (Road Construction and Maintenance) of the Idaho Forest Practices Act (IFPA) Rules are addressed. Relevant portions of the rules and regulations developed under the Idaho Stream Protection Act are also covered.

Appendix B of this document lists soil and water conservation practices which tie directly to the State water quality laws affecting timber sales. The practices, their objectives, implementation and effectiveness are discussed.

The goals and objectives in site specific mitigation for the Swiftwater Timber Sale are shown below.

TABLE 4.10 - Watershed Goals and Objectives

Goal	Objective
Maintain and enhance water quality.	Minimize increases in introduced sediment and sediment transport. Maintain or enhance existing water temperatures.
Maintain or enhance channel or slope stability.	Minimize changes in geomorphic stability, sediment loading, and storage capacity for sediment and water.
Maintain long-term inputs of large woody debris.	Woody debris stabilizes the stream bed and stores sediment in tributary streams, therefore maintain long-term riparian function.
Maintain soil productivity.	Minimize erosion, compaction and displacement that can result in increased sediment and reduced capability to support vigorous plant communities in the riparian zone.

Site Specific Mitigation Measures for Upper Swiftwater Timber Sale.

a. To limit increases in water temperature, maintain all streamside vegetation which provides shading to the water surface.

b. To provide for sediment storage; allow for no decrease in numbers of acting and potential woody debris along any Class I or II stream section in this watershed.

c. No riparian harvest shall be scheduled along any Class I or II stream. (Exception will be a minimum numbers of trees required for yarding systems breakthroughs for skyline yarding systems). Place unit boundaries at or above the slope break above live water. Where well defined slope break does not exist, boundary will be located above streamcourse sufficient distance to provide for goals and objectives above.

d. All road construction/reconstruction, associated with timber harvesting will be mitigated to 80%. Roads constructed in past entries and identified as being below the required 80% mitigation will be upgraded to meet the 80% effectiveness level.

e. Use of temporary roads will be minimized. Temporary road locations shall be reviewed and approved by an interdisciplinary team consisting of at least the District Ranger, the timber sale Forest Service Representative, a logging system specialist, and a fisheries/ hydrology specialist. Temporary roads identified will be obliterated back to the original ground contours, seeded and mulched in the same season constructed and used.

f. Prescribed burning will have a prescription to meet the needs for reforestation while burning at moisture levels to minimize duff consumption. Burn patterns and contingency plans should be designed to protect streamcourses and riparian area. Use non-traditional approaches to protection of streamcourses and riparian areas such as foam agents, sprinklers, YUM yarding or handpiling will be used as necessary to achieve objectives.

INDIRECT AND CUMULATIVE EFFECTS

There would be additional sediment moved downstream in Swiftwater Creek, but this is not expected to result in any significant incremental loss of habitat capability. The cumulative effects to Swiftwater Creek and the Selway River should be insignificant.

MONITORING REQUIRED

Swiftwater Creek will need to be resurveyed for its fish habitat components. Watershed condition inventories will need to be performed. Analysis of these will verify whether there is an upward trend in place in fish habitat components, and whether channel integrity is being maintained.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

The short-term use is not expected to result in a significant change to long-term productivity. Actions tied to decreasing sediment inputs to Swiftwater Creek are significant enough to offset increases due to the action. There should be maintenance of existing capability.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None known or suspected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Sediment will be produced and will enter Swiftwater Creek. However, sediment additions from the proposed action will be balanced by the required mitigation and watershed improvement projects. There is enough work programmed through improvement to result in significant gains

in reducing sediment and improving habitat capability to offset the effects of the preferred alternative.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None known or suspected.

b. Upward Trend

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Table 4.11 displays information from Appendix A of the Forest Plan and shows that the management objective for Swiftwater Creek is 80% of the fishery habitat potential. This DFC for Swiftwater Creek has been analyzed relative to optimum conditions for the various habitat components for streams in the Clearwater drainage. Swiftwater Creek is below objective for a number of its habitat components.

The current fishery habitat condition is the existing condition as it relates to the natural potential of each habitat component within a prescription watershed. These values are calculated by weighting each set of habitat components by the length of each channel type.

These figures were displayed in Chapter Three, Table 3.4, they are repeated here.

TABLE 4.11- EXISTING FISH HABITAT CONDITION

Habitat Component	Rating of A Channel	Rating of B Channel	Weighted Average
Summer Rearing	79	79	79
Winter Rearing	45	62	49
Spawning	75	88	77
Riparian Condition	55	55	55

The management objective for Swiftwater Creek is 80%. Existing conditions do not currently meet the objectives for winter rearing or riparian components. Summer rearing and spawning are very close and probably do meet the objectives. Averaging these four values gives a relative comparison of the streams overall rating, percentage of optimum, which would be about 65 percent. The most limiting element in this case is winter rearing at 49 percent of habitat potential.

Upward trend means that stream conditions determined to be below the Forest Plan objective will move toward the objective over time. All presently measured habitat components, except sediment, should display a continuous upward trend, with no temporary downturns or reduction in the rate of improvement.

Where deposited sediment is a primary concern, sediment sources in the watershed need to be identified and stabilized. Watershed improvement inventories have been completed for the Swiftwater Analysis Area. Planned improvement projects were described in Tbale 4.7 of this chapter.

To help determine the site specific actions which would be implemented to insure an upward trend in this drainage, the ID Team visited the Swiftwater area on July 11, 1991. This field visit helped in prioritizing the scheduled watershed improvements in the Swiftwater watershed. Improvements will involve projects such as:

a. Old roads which are producing excessive sediment will be reconstructed to meet their planned mitigation level of 80 percent.

b. Grass seeding and revegetation will occur on all areas of raw soil where 80% mitigation is not being achieved and undesirable sediments are being produced in the watershed. This will include cut and fill slopes, as well as interior portions of harvest units and firelines of areas of exposed soil.

c. Natural sediment sources such as eroding streambanks will be revegetated as money and opportunity present themselves.

Where deposited sediment is a limiting factor, an improving trend should be maintained by limiting additional sediment from proposed activities to below the maximum increase allowable as specified in Forest Plan Appendix A. This should allow for the natural flushing capacity of the stream to remove accumulated sediment. All action alternatives provide for this predicted sediment flushing, but at various levels.

The Forest Plan, Appendix A, allows for a 45% increase in sediment over baseline conditions. The NEZSED and FISHSED models projected that at least 80% of habitat potential would be maintained with sediment increases of this amount twice during a decade. With site specific evaluation showing that Swiftwater is below objective primarily due to sediment from past activities, the natural ability of the stream to flush sediment is an important element in maintaining an upward trend. The greater the increase in sediment over baseline conditions, the less stream energy available to flush existing deposited sediment from the system. All alternatives provide for increased flushing ability by staying well below the threshold levels for sediment production.

Only sediment production is expected to be a factor in maintaining upward trend. After site specific review of the proposed watershed improvement projects (Table 4.7) and analysis of the stream habitat components and capabilities, it is recognized that implementation of these projects will provide significant reductions in sediment inputs to the stream. These improvements are believed to be adequate to maintain existing habitat capabilities will providing for an upward trend over the short-term (decade).

Factors considered in this determination include:

a. There will be more miles of reconstruction/improvement than new construction resulting in an improvement of the existing condition.

b. The proposed projects include extensive resloping and revegetation of cutslopes, installation of drop inlets (large diameter culvert section at entrance to culverts that prevent plugging of culverts), addition of additional culverts and water bars to facilitate drainage, and establishement of vegetation that will stabilize slopes. These projects will reduce sediment production in the watershed. Field review has verified that these areas are currently producing significant amounts of sediment and are responsible for much of the poor existing condition. Maintenance of these sites will be effective at reducing sediment immediately upon implementation.

c. Monitoring

The following table displays the fish-water quality elements that will be monitored under any of the action alternatives to determine trends. Some of these will be site specific to the Swiftwater Creek drainage, while others will be covered more generically through broad interpretation from Forest Plan monitoring sites.

TABLE 4.12- MONITORING REQUIREMENTS

#	MONITORING REQUIREMENT	DOCUMENTED IN	WHEN DONE
1	Soil and water rehabilitation and improvements.	Upper Swiftwater EIS	1993-1999
2	Fish habitat trends by drainage.	Forest Plan	Once in Five years
3	Impacts of management activities on soils.	Upper Swiftwater EIS	Year of Activity
4	Impacts of management activities on water quality.	Forest Plan	Year of Activity
5	Effectiveness of specific water quality mitigation measures.	Upper Swiftwater EIS	Year of Activity
6	Impacts of management activities on riparian areas.	Upper Swiftwater EIS	Year of Activity
7	Population trends of indicator species-wildlife and fish.	Forest Plan	Annually
8	Additional surveys to verify upward trend and effectiveness of mitigation measures.	Upper Swiftwater EIS	4-5 Years Post Activity

D. Biological Diversity, Fragmentation, and Ecosystem Management

GENERAL INFORMATION

This section is designed to describe the effects of each alternative on the structure, composition and function of the vegetation in the analysis area. Other sections in this chapter discuss the effects of these changes on the animals and invertebrates that rely on the vegetation for their survival. Taken together, these sections comprise the entire discussion of the effects of the proposed management activities on biological diversity.

This analysis will concentrate on the effects of alternatives on the patterns and composition of vegetation. These two measures, along with their inherent place in time and space are being used because they are somewhat quantifiable and describable. They also relate to the processes and connections between the biota and the landscape. Our current knowledge and skills are too limited to assess effects on processes and biological connections.

The patterns and composition of the vegetation on the analysis area are always changing. A "snapshot" of the existing conditions is portrayed in Chapter 3. Each alternative, if implemented, will have effects on these existing conditions.

Since this section was written and published, the existing condition has changed. Some of the vegetation has died and rotted, some new plants have begun to grow. These ever-changing ecosystems can best be described by using estimates of the amount of certain broad classes of vegetation called succesional stages, ie seral conifers, late successional oldgrowth, etc. These stages are products of the landtypes on which the vegetation grows, the temperature and moisture regimes that exist on these sites and the perturbations or disturbances that influence the vegetation's establishment and growth.

In Chapter 3, we offered a scenerio that probably accounts for the origin of the natural vegetation on the analysis area. As the vegetation grows over time, this natural cycle will repeat itself

until an element of a longer cycle, such as another ice age, interupts these relatively short stand-replacing cycles. These cycles lay down patterns of vegetation on the landscape that can be seen both from an aerial view and from on the ground. These patches have observable edges that can be used to define their shape and size. The structure and composition of the edges themselves play an important role in the biological diversity on the analysis area. Patch sizes, shapes, composition and their edge characteristics will be used to characterize the changes in the vegetative diversity proposed by each alternative.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Since things are always changing in this forested environment, the discussion of Alternative 1 - No Action, will display the scenerio that will likely take place within the forseeable future if one of the action alternatives is not implemented. The discussions of each action alternative will then display the effects to this natural progression due to the activities in that alternative.

Alternative One - No Action

As shown in Chapter 3, the vegetative mosaic on this area is a product of stand replacing wildfires in conjunction with disease and insect infestations, primarily armellaria root rot. Root rot infection sources are common throughout the analysis area, and are persistent for 50-60 years on these sites. Historically, these infection sites have been subjected to large, lethal wildfires on a cycle of near 120 years, which generally result in about 70% of the landscape being turned back to a young even-aged forest. Within this broad cycle, other smaller fires and a mosaic of root rot infection sites contribute to a diversity of structure and stages of vegetation. About 65% of the analysis area is currently in an age catagory of 60-100 years old, 20% is younger than 60 years and 15% is older than 100 years. The older stands seem to be the least likely to be changed due to a disturbance such as a large wildfire because of their location in the landscape. The younger stands are primarily the result of logging since the late 1950's.

Within the next 50 years, those areas within the 60-100 year catagory will be moving into a position in the ecosystem where they will most likely be subjected to a stand-replacing, large wildfire. This is due to the fuel buildup caused by root rot mortality. Even without man-caused ignition, it is highly likely that 50-100% of the analysis area will be burned by a stand-replacing wildfire within this timeframe. If this occurs, the younger stands that are interspersed within this broad area will also be subject to some of the effects of this fire. The older stands may be affected, but to a lesser degree, due to their natural inflammability. The structural diversity of the area will probably decrease as a large area of highly diverse structure is reduced to a young regenerating stand. Species, or compositional diversity will shift to early successional vegetation, ie those plants which compete best on highly disturbed sites, and species that do well within a mature forest environment will decrease in numbers. Average patch size will increase. The effects on edge "fuzziness" are hard to predict. The intensity, extent and duration of the wildfire will effect this parameter, and may vary greatly.

Alternatives Two, Three, Four, Five and Six-

These alternatives propose to harvest some amount of timber with old growth characteristics. These areas are **not** designated old growth (management area 20) and all alternatives would maintain the XXX acres of designated old growth. The table on the following page shows the old growth character for each proposed unit and the amount of old growth proposed for each alternative.

TABLE 4.13 - AMOUNT OF OLD GROWTH HARVEST BY ALTERNATIVE

			ALTERNATIVE					
HARVEST UNIT #	ACRES	OLD GROWTH CHARACTER	1	2	3	4	5	6
01	37	Old Growth	NO	YES	YES	YES	YES	YES
02	34	Replacement Old Growth	NO	YES	NO	YES	YES	YES
03	38	Replacement Old Growth	NO	YES	NO	YES	NO	NO
04	37	Replacement Old Growth	NO	YES	YES	YES	YES	YES
05	30	Replacement Old Growth	NO	YES	NO	YES	YES	YES
06	40	Old Growth	NO	YES	YES	YES	YES	YES
07	37	Old Growth	NO	NO	YES	YES	NO	NO
08	23	Replacement Old Growth	NO	YES	YES	YES	YES	YES
09	40	Replacement Old Growth	NO	YES	NO	YES	YES	YES
10	30	Replacement Old Growth	NO	YES	NO	YES	YES	YES
11	40	Replacement Old Growth	NO	NO	NO	YES	NO	YES
12	30	Replacement Old Growth	NO	NO	NO	YES	NO	NO
14	40	Replacement Old Growth	NO	NO	NO	YES	NO	YES
TOTAL ACRES **REPLACEMENT OLD GROWTH** HARVESTED			**0**	**232**	**63**	**345**	**234**	**274**
TOTAL ACRES **OLD GROWTH** HARVESTED			**0**	**77**	**114**	**114**	**77**	**77**

Each of these alternatives proposes some timber harvest, and some propose road construction and/or reconstruction. These activities will, to some extent, change the natural progression that is portrayed under the No Action Alternative. They also have direct effects on the parameters we are using to assess changes to biodiversity.

The size of the proposed harvest units is relatively uniform, varying from 23 to 40 acres in size. While within the bounds of the natural variation for patch size on this analysis area, the concentration and ordered spacing of these patches is well outside the natural variation that exists here. These units will have edges that are not very "fuzzy". These edges will be in places that do not ordinarily occur in natural landscapes, that is on contour across mid slopes. Some of this occurance, especially adjacent to wet riparian areas is common naturally on the analysis area. Shapes of these patches will be more geometric than natural-occurring patches. Both the shape and edge parameters will change over time and become more natural as minor perturbations happen within and at the edge of these patches.

The composition of these units will be different from the onset of logging. Trees, both dead and alive that would have survived even a stand-replacing wildfire will be taken away as merchantable sawlogs. Trees left for vertical diversity, as seed sources and unmerchantable down logs, standing dead trees and other vegetative debris will account for some structural as well as compositional diversity as the regenerating stand adjusts to these influences. Planting of

conifers that would not normally be expected to revegetate these sites will have a profound influence on the vegetative composition as well as the physical structure of these stands.

INDIRECT AND CUMULATIVE EFFECTS

The continued placement of similar sized and shaped units within this landscape will result in a total pattern change within the next 80-100 years. It is expected that edges will be more well defined, and age/structure classes will be more distinct and more homogeneous within stands. This fragmentation of the forested environment on this landscape would normally be replaced periodically with large areas of homogeneous stands caused by wildfires. This type of disturbance may occur again on the analysis area. The effects of a manmade pattern on the fire's behavior and the subsequent regenerating forest is unpredictable at this time. It is estimated that the reestablishment of a totally natural pattern of vegetation would take hundreds of years void of human disturbance.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Removal of forest products from this landscape will result in moving and storing carbon and other elements into long-term storage. This change is not as dramatic as that which resulted when large stand-replacing wildfires burned up the wood and released these elements directly into the atmosphere. Present logging and site preparation practices will mimic some of the natural processes that occured here, but cannot duplicate them. The pattern of soil loss due to erosion may change as roads are constructed and units are logged, but the sum of errosional losses will probably decrease as fewer, large stand-replacing fires occur on the managed landscape. Long-term productivity will be enhanced if the increased soil depth is not compacted or the chemical properties are not changed by man's activities.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

No irreversible and irretrievable commitment of resources were identified.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

None identified.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, AND CONTROLS

None identified.

E. Threatened, Endangered and Sensitive Species

1. Wildlife

a. Threatened and Endangered

GENERAL INFORMATION

As required by the Endangered Species Act and 50 CFR 402.12(c), a list of species and designated or proposed critical habitat was requested from the U.S. Fish and Wildlife Service. The reply listed the grey wolf as a threatened species which may occur within the Swiftwater area. The ID team also identified the bald eagle as inhabiting the perimeter of the study area

from October through March. A Biological Evaluations for Threatened and Endangered species has been prepared and is contained in Appendix C of this DEIS.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

The Biological Evaluations are summarized below by alterntive.

Alternative One- No Action

The No Action alternative would maintain the existing situation. There would be no impacts on habitat or populations for the gray wolf, bald eagle, or grizzly bear.

Alternatives Two, Three, Four, Five, and Six-

These alternatives would construct, or reconstruct, roads in the Swiftwater area and would initiate timber harvesting. With the prescribed access controls and unit layout there would be no adverse impacts on habitat or populations for the gray wolf. The increased forage areas that would be created by the proposed harvesting would contribute to an increased population of possible prey for the gray wolf. There is no proposed activity within the bald eagle habitat along the Selway River; therefore, there would be no impacts on the habitat, populations, or prey base for the bald eagle. The gray wolf has been given a "not likely to adversely effect" determination and the bald eagle and grizzly bear have been given "no effect" determinations.

MITIGATION REQUIRED

Timber sale contract clause C6.25# - Protection of Habitat of Endangered Species would be implemented. This contract clause states that "...if other such areas are discovered, or if new species are listed on the Endangered Species List, Forest Service may either cancel under C8.2 or unilaterally modify ... to provide additional protection regardless of when such facts become known."

INDIRECT AND CUMULATIVE EFFECTS

The cumulative vegetative changes described in the Biodiversity, Fragmentation, and Ecosystem Management section would hold true here. These vegetation changes, in the long-term, may have an effect on Federally listed species, but it is unknown what these effects may be.

MONITORING REQUIRED

All threatened and endangered wildlife species are also management indicator species (discussed in Sec. III A of this chapter) and population trends of these species are monitored annually [36 CFR 219.19(6) and Forest Plan, Appendix O, p.3].

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Gray wolf and bald eagle management would not affect the inherent productivity of the land but could be a factor in timber harvest scheduling.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

There would be no irreversible of irretrievable commitment of resources unless a conflict develops between human activity and recovery of a threatened or endangered species. If that

happens, further analysis would be done to resolve the conflict. Until threatened or endangered populations have recovered to desired levels, resolution would favor the wolf and bald eagle.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Additional roads would be constructed. Vegetation would be altered in places and human presence would increase. These factors may effect future habitat of a threatened or endangered species however, at this time no adverse effects are expected.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, AND CONTROLS

No conflicts are expected with regard to Fish and Wildlife Service recovery plans for the gray wolf or the bald eagle.

b. Sensitive Species

GENERAL INFORMATION

A Biological Evaluation was prepared in compliance with Chapter 2670 of the Forest Service Manual. Forest Service direction for sensitive species is to manage habitats to maintain at least viable populations of such species and avoid actions which may cause a species to become threatened or endangered. The "Sensitive Wildlife Biological Evaluation" is summarized below: The actual document is contained in the project file and is incorporated here by reference.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

The table below displays the determinations of effect to the known or suspected sensitive wildlife species within the Upper Swiftwater analysis area. These determinations are based on analysis of the preffered alternative (Alternative Six) only. Following the table is further discussion for those species that had other than a "no effect on species" determination.

TABLE 4.14- DETERMINATION OF EFFECTS TO SENSITIVE WILDLIFE SPECIES

COMMON NAME	SCIENTIFIC NAME	DETERMINATION OF EFFECT
Black-backed & Three-toed Woodpeckers	*Picoides articus & P. tridactylus*	May affect individuals, but is not likely to jeopardize population viability or result in a trend toward Federal listing
Boreal Owl	*Aegolius gentilis*	No effect on species
Coeur d'Alene Salamander	*Plethodon vandykei*	May affect individuals, but is not likely to jeopardize population viability or result in a trend toward Federal listing
Flammulated Owl	*Otus flammeolus*	May affect individuals, but is not likely to jeopardize population viability or result in a trend toward Federal listing
Fisher	*Martes pennanti*	May affect individuals, but is not likely to jeopardize population viability or result in a trend toward Federal listing
Harlequin Duck	*Histrionicus pennanti*	No effect on species
Lynx	*Felis lynx canadensis*	No effect on species
Western Big-eared Bat	*Plecotus townsendii*	No effect on species
White-headed Woodpecker	*Picoides albolarvatus*	No effect on species
Wolverine	*Gulo gulo luscus*	No effect on species

1. Black-backed and Three-toed Woodpeckers

Even though there is a low potential for these species to occur and the existing habitat for these species is marginal within the analysis area it has been given a "may affect individuals" determination. This is a conservative determination because there is little information on these species and the effects of forest management activities on them. Even though a "may affect individuals" determination has been given, no effect to these species is expected.

2. Coeur d'Alene Salamander

This specie's habitat can be effected by soil erosion. The proposed preferred alternative has the potential to increase soil erosion, even though effects would be mitigated to be minimal, it may affect the habitat of the Coeur d'Alene Salamander and the determination "may affect individuals" has been given.

3. Flammulated Owl

As with the Black-backed and Three-toed Woodpeckers, there is little information on the Flammulated Owl on the Selway District. There is a low potential for the species to occur within the analysis area and there is only marginal habitat but the conservative determination of "may affect individuals" has been given.

4. Fisher

The habitat for Fishers is limited within the analysis area and their potential occurance is low. The proposed activity would increase human disturbance and access to the Swiftwater area which may limit the supporting potential of the area. The fisher has been given a "may affect individuals" determination.

MITIGATION REQUIRED

The Forest Plan specifies that approximately 5 snags and 4 green trees per acre should be retained in harvest units. 20-25% of the trees retained should be greater than 20 inches in diameter and the remainder at least 12 inches in diameter. The trees should be left in well dispersed clumps throughout the units.

INDIRECT AND CUMULATIVE EFFECTS

The planned activity will have little affect on tree cover, snag sizes, and food sources for the identified sensitive species outside of the proposed harvest units. The proposed harvest units could reduce the total amount of habitat (whether nesting or forage) available within the Swiftwater area but over time and space (the Forest or District) the amount of habitat available would allow for viable populations of these sensitive species.

MONITORING REQUIRED

No monitoring is specifically required in the Forest Plan. District personnel are encouraged to document any sightings of wildlife to the District Biologist.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

As mentioned above, no adverse effect to sensitive species is expected in the short-term nor long-term. Some species have inadequate information to determine whether harvest activities will have adverse effects in the long-term.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None are expected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

None are expected.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None are expected.

2. Fish

a. Threatened and Endangered

GENERAL INFORMATION

In its final rule dated April 7, 1992 the National Marine Fisheries Service listed fall chinook as a Threatened Species in the Snake River and Clearwater subbasin. The Swiftwater watershed lies within this designated area. Swiftwater Creek enters the Selway River at a point downstream of historic fall chinook occurence. Current fall chinook habitat is believed to end on the Clearwater River near Greer, although fall chinook straying from other systems have been found as far upstream as Kooskia in the past two years (Roseburg. pers.comm). Therefore the Upper Swiftwater EIS requires effects on fall chinook be examined in accord with section 7 of the Endangered Species Act.

National Marine Fisheries Service and U.S Forest Service Regions 1, 4 and 6 have an agreement that charges the US Forest Service to prepare information on the cumulative effects of on-going projects within the various basins with critical chinook habitat. This analysis was initiated in the summer of 1992 and is continuing today (spring 1993) with an expected completion date of July 1993. Until that time, it would be inappropriate to make a determination of effects on the fall chinook salmon. A determination of effect will be prepared for the proposed Upper Swiftwater Timber Sale upon the completion of the basin-wide cumulative effects analysis. Should the Upper Swiftwater Timber Sale be other than a "No Effect," consultation with NMFS will occur prior to a decision on this timber sale by the Nez Perce Forest Supervisor.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Alternative One

This alternative would maintain or improve the existing condition within Swiftwater Creek. No new roads would be constructed and no new units would be harvested. Watershed improvement projects would be be initiated. As a result, it is expected that sediment production and water yield would decrease overtime.

Alternatives Two, Three, Four, Five and Six

These alternatives would construct/reconstruct roads in the Swiftwater area and would initiate timber harvesting. All five action alternatives would have direct effects through addition of sediment, increases in water yield, and increases in risk of catastrophic landslope failures. The effects have been analyzed, and are not likely to have an adverse effect since the degree of their effects is kept below thresholds where negative effects are expected to occur.

MITIGATION REQUIRED

There is no chinook spawning or rearing habitat within Swiftwater Creek, therefore chinook habitat will not be directly affected. The level of activity proposed will not in itself affect chinook habitat downstream, unless land management activities are responsible for creation of a major event such as a landslide or debris torrent of such size that considerable sediments were transported into the Selway River. The opportunity exists for such an event as roading and harvesting will occur on sensitive landtypes prone to such events. As a result, the mitigation

required will be those associated with road building and yarding. All road construction will be mitigated to 80 percent (maximum possible).

INDIRECT AND CUMULATIVE EFFECTS

The effects from the proposed actions are not expected to result in any significant indirect effects, since the direct effects have been designed to be insignificant themselves. There is the possibility of long-term cumulative effects if a single large, or multiple small sediment producing events were to occur over time. The nearest known population of spawning fall chinook is approximately 46 miles downstream at Greer, Idaho. There is however, suitable habitat for fall chinook within historic fall range in the Selway River which Swiftwater enters. The results of a major debris torrent or landslide (sediment producing event) from Swiftwater Creek alone that could be sufficient to cause an adverse effect on fall chinook in Greer, Idaho is highly unlikely, but not impossible. Such an event from Swiftwater Creek would have to be coupled with other natural events such as rain-on-snow or extremely heavy rainfall to have an effect on fall chinook in Greer.

MONITORING REQUIRED

Since the threat to fall chinook salmon comes from mass events associated with roading or harvesting, regularly scheduled road maintenance will be tracked to assure lack of maintenance does not result in creation of significant land disturbing events. Regular reforestation exams will assure reforestation occurs reducing risk of hillslope failure through propagation of stabilizing rooting strength.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Short-term use (harvest) may effect water yields. The effects are minimzed by the level of activity proposed and should not result in any long-term effects. The short-term use (construction of roads) could have an adverse effect on the long-term productivity of the land. This would remain for some time. This would not have an effect on fall chinook slamon. The short-term use (sediment production) is not expected to have any long-term effects on fish habitat, as the amounts and length of effects are small.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None are anticipated.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Instream sediment levels will rise slightly in the short-term, as will water yields. There will be increased risk of massive landslope failures.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None.

b. Sensitive Species

GENERAL INFORMATION

A biological evaluation was prepared in compliance with Chapter 2670 of the Forest Service Manual. Forest Service direction for sensitive species is to manage to maintain at least viable populations of such species and avoid actions which may cause a species to become threatened or endangered. The sensitive Fish Biological Evaluation is summarized below: The actual document is contained in the project file and is incorporated here by reference.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

The table below displays the determinations of effect to the known or suspected sensitive fish species within the Upper Swiftwater analysis area. These determinations are based on analysis of the preferred alternative (Alternative 6) only.

TABLE 4.15- DETERMINATION OF EFFECTS TO SENSITIVE FISH SPECIES

COMMON NAME	SCIENTIFIC NAME	DETERMINATION OF EFFECT
Westslope Cutthroat Trout	*Oncorhynchus clarkii lewisi*	May affect individuals, but is not likely to jeopardize population viability or result in a trend toward Federal listing
Steelhead Trout	*Oncorhynchus mykiss*	May affect individuals, but is not likely to jeopardize population viability or result in a trend toward Federal listing
Bull Trout	*Salvelinus confluentus*	May affect individuals, but is not likely to jeopardize population viability or result in a trend toward Federal listing

1. Westslope Cutthroat Trout

Cutthroat trout are found within Swiftwater Creek in densities approaching the lower end of their expected range when found in anadromous systems. Current sediment levels are very high, and are likely affecting reproductive and rearing success. Additional sediment production under the preferred alternative is kept at levels not expected to have significant effect on the existing condition.

2. Steelhead Trout

Steelhead trout numbers are depressed due to a combination of below objective habitat and poor escapement. Generally habitat is improving. Additional sediment production is within State and Federal standards and meets Forest Plan standards designed to prevent further degradation of habitat. Although more risk is taken by building roads on sensitive landtypes, it is not expected that these actions will result in declines in fish habitat that are significant enough adversely effect steelhead or their numbers.

3. Bull Trout

Little is known about the life history of bull trout in the Clearwater and Selway River systems. Although large adult bull trout are taken by sports fishing in the Selway River, they have not been identified in Swiftwater Creek. Swiftwater Creek is a fourth order stream, and given that bull trout are known to prefer third and fourth streams should offer suitable habitat. Bull trout are known to be very sensitive to high sediment levels (both for spawniong and rearing). It may be that given the current high sediment levels that bull trout have been extirpated from this system already, but his is not known to be fact. Bull trout are also known to prefer streams with upwelling water, another condition it is not known that Swiftwater Creek meets. The current proposal does not propose large sediment increases that would further degrade bull trout habitat.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Alternative One

This alternative would maintain or improve the existing condition within Swiftwater Creek. No new roads would be constructed and no new units would be harvested. Watershed improvement projects would continue as planned. As a result, it is expected that sediment production

and water yield would decrease in the short trm resulting in the most rapid improvement of fish habitat of any of the alternatives.

Alternatives Two, Three, Four, Five and Six

These alternatives would construct/reconstruct roads in the Swiftwater area and would initiate timber harvesting. All five action alternatives would have direct effects through addition of sediment, increases in water yield, and increases in risk of catastrophic landslope failures. The effects have been analyzed, and are not likely to have an adverse effect since the degree of their effects is kept below thresholds where negative effects are expected to occur.

MITIGATION REQUIRED

The level of activity proposed is not expected to adversely affect habitat for sensitive fish species unless land management activities are responsible for creation of a major event such as a landslide or debris torrent of such size that considerable sediments are deposited into Swiftwater Creek. The opportunity exists for such an event as roading and harvesting will occur on sensitive landtypes prone to such events. As a result, the mitigation required will be those associated with road building (80 percent/maximum possible), harvesting, and prescribed burning.

INDIRECT AND CUMULATIVE EFFECTS

The effects from the proposed actions are not expected to result in any significant indirect effects, since they have been designed and modeled to be to be insignificant themselves. There is the possibility of long-term cumulative effects if a large scale event(s) were to occur. The results of a major debris torrent or landslide within Swiftwater Creek would be sufficient to cause a direct and given current condition cumulative effect on fish habitat in Swiftwater Creek. Such an event coupled with other similarly sized events from nearby drainages could have a cumulative effect on the Selway River. Although such a situation is unlikely, but not impossible, especially since many nearby drainages are heavily roaded, and much of this is on landslide prone landtypes. A series of natural events such as a massive rain on snow event could trigger such multiple events. Since the possiblity exists for these types of events, individual sensitive fishe species may be affected.

MONITORING REQUIRED

Since the real threat to sensitive fish comes from the probability of mass events associated with roading or harvesting, regularly scheduled road maintenance will be tracked to assure lack of maintenance does not result in creation of significant land disturbing events. Regular reforestation exams will assure reforestation occurs reducing risk of hillslope failure through propagation of stabilizing rooting strength. Watershed condition inventories, fish habitat inventories and channel stability and reach surveys will be performed.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Short-term use (harvest) may effect water yields. The effects are minimzed by the level of activity proposed and should not result in any long-term effects. The short-term use (construction of roads) could have an adverse effect on the long-term productivity of the land. This would remain for some time. This would not have an effect on sensitive fish. The short-term use (sediment production) is not expected to have any long-term effects on fish habitat, as the short-term effects are limited.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Local roads will remain indefinitely. There are no other irretrievable commitment of resources planned or expected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Instream sediment levels will rise slightly in the short-term, as will water yields. There will be increased risk of massive landslope failures.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None known or suspected.

3. Plant Species

a. Threatened and Endangered

There are no known or suspected Threatened or Endangered plants within the Upper Swiftwater analysis area; therefore no alternative would have an adverse effect on habitat or populations.

b. Sensitive

DIRECT EFFECTS COMPARED BY ALTERNATIVE

The following table shows the effects of the proposed actions on sensitive species within the Upper Swiftwater analysis area for all action alternatives. A biological evaluation has been completed for these species and is contained in the project file.

TABLE 4.16 - EFFECTS TO SENSITIVE PLANTS IN THE SWIFTWATER AREA

SPECIES	PROBABILITY OF IMPACT	DETERMINATION OF EFFECT
Bank Monkey Flower (*Mimulus clivicola*)	No management activities are plannned in the habitats occupied this species. No individuals or populations would be affected.	No effect on species
Clustered Lady's Slipper (*Cypripedium fasciculatum*)	Activities are proposed in this habitat however, designated old growth areas and riparian management practices should effectively protect most populations. Alternatives 2 and 4 would require additional mitigation to protect a population near proposed unit # 3.	May affect individuals, but id not likely to jeopardize population viability or result in a trend toward Federal listing.
Constance's Bittercress (*Cardamine constanceia*)	Only limited activity is proposed for these habitats. Designated old growth areas and conservative riparian management should adequately protect populations. Research has shown that slight disturbances can stimulate growth of this species.	No effect to species
Crinkle-Awn Fescue (*Festuca subuliflora*)	Limited activity is proposed in the habitat for this species. Designated old growth and conservative riparian management should adequately protect populations. The Conservation Data Center has established a monitoring plot for this species to monitor the effects of harvest activity. The plot is located within the Peterson Salt Timber Sale area located approximately 4 miles to the east.	No effect to species
Dasynotus (*Dasynotus daubenmirei*)	This species does not occur in the Swiftwater area and therefor should not be affected by any of the proposed activities.	No effect to species
Henderson's sedge (*Carex hendersonii*)	Only limited activities are proposed in the habitat for this species. Designated old growth areas and conservative riparian management should adequately protect any existing populations.	No effect to species
Oregon Bentgrass (*Agrostis oregonensis*)	Only limited activities are proposed in the habitat for this species. Designated old growth areas and conservative riparian management should adequately protect any existing populations.	No effect to species
Oregon Bluebells (*Mertensia bella*)	Only limited activities are proposed in the habitat for this species. There is no activity proposed that would effect known popluations of the M. bella. Designated old growth areas and conservative riparian management should adequately protect any existing populations. Research has shown that ground disturbance is not detrimental to this species.	No effect to species
Pacific Dogwood (*Cornus nuttallii*)	This species is only known to occur in the lowest portions of the analysis area, near the Selway River. Designated old growth areas and conservative riparian management should adequately protect any other existing populations.	No effect to species

MITIGATION REQUIRED

No mitigation is required for the preferred alternative to protect sensitive plant species as designated old growth and riparian management would adequately protect these species.

Alternatives 2 and 4, which propose to harvest unit #3 would require additional mitigation to protect a known population of Clustered Lady's Slipper near that unit. Should one of these alternatives be selected the District Botanist would apply on-the-ground mitigation that would include marking leave trees near the population or adjusting the harvest unit boundary

INDIRECT AND CUMULATIVE EFFECTS

Individual plants may be effected by any of the alternatives however, the viability of the species' populations would not be effected.

MONITORING REQUIRED

No monitoring is required.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Harvest of timber products and road construction should not effect the long-term population viability of any sensitive plant species known or suspected to exist in the Swiftwater area.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None are expected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

None are expected

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None are expected.

F. Transportation System

The environmental effects of road construction and reconstruction have been discussed in other sections of this chapter, specifically section B, Elk Habiat and C, Soils, Watershed and Fisheries. Rather than repeat those sections, this section will discuss the use of existing and proposed roads (access management) and construction of low-standard, temporary roads which would be obliterated. Additional information on road construction and access management can be found in the Nez Perce Forest Plan EIS Chapter IV pages 78-89 and the Nez Perce Forest Plan ROD page 30. These sections are incorporated here by reference.

1. Access Management

GENERAL INFORMATION

The Forest Plan Record of Decision states on page 30 that "roads will be closed or restricted primarily to provide security for wildlife." In addition, the Nez Perce Forest approach to road

closures and restrictions was changed: "In the past, we decided which roads should be closed; now we will be deciding which roads are to remain open."

As required by Forest Plan standards (Chapter II, p. 24), a methodology was developed in 1988 to provide management and distribution of forest users. It includes both roads and trails. The key feature of this methodology is a tie among access management strategies, Forest Plan management area objectives and standards, and site-specific evaluation areas. Road densities and distribution are measured over time in each evaluation area and resource conditions correlated with them. Road access strategies were evaluated to determine which would comply with these standards. The analysis was based on preceding management direction, wildlife needs, impacts on recreation use, timber management needs, and public participation.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Alternatives 1, 3, 4 and 5-

No change in the current access management scheme within the Swiftwater analysis area is proposed. Roads #470 and #1119 would remain open yearlong to all motorized vehicles. Roads which are currently restricted would remain restricted under their current access prescription.

Alternatives 2 and 6-

These alternatives propose to close all proposed roads year-long to all motorized vehicles. Existing road access prescriptions would remain with the exception of road #1119 south of its junction with road #9723 to it's junction with road #1129. The access for this road would change from a yearlong closure to highway vehicles to a yearlong closure to all motorized vehicles (excluding snowmoblies after Dec. 15). No adverse environmental impacts would result from this action as it is primarily an administative action. Forest visitors which use off road vehicles may be inconvienced by the proposed road closure however, motorized access would remain to those portions of the Forest by way of road #286 over Lookout Butte.

In all action alternatives, official traffic related to timber harvest, reforestation, fish and wildlife habitat improvement, maintenance of road drainage structures, and fire suppression would be allowed. Public access for firewood could be allowed if conditions warrant and Forest Plan standards are met.

MITIGATION REQUIRED

To prevent access to newly constructed roads, barriers would be placed in strategic places which would deny access to the types of vehicles which would be prohibited. There are three types of barriers used on the Selway District; cement, gates, and "tank traps" (impassible earthen barrier). Appropriate barriers would be used for each road based on the potential for that road barrier being breeched.

INDIRECT AND CUMULATIVE EFFECTS

Adverse effects of access management primarily involve people and thier use of National Forest lands. The proposed access management would not allow for vehicular use of newly constructed roads, but would allow foot and horse traffic into previously inaccessible areas. This increased access may have an indirect effect on wildlife. No cumulative effects are expected.

MONITORING REQUIRED

Informal, annual monitoring of barrier effectiveness would be required. If it is shown that a barrier is being continually breeched or is otherwise ineffective, that barrier ahould be replaced with a more effective barrier.

The Forest Plan (Chpater V, page 7 and Appendix O, page 16) requires that the adequacy of transportation facilities to meet resource objectives and user needs be monitored on a 5-year basis.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Construction of permanent roads has a long-term effect on vegetative productivity in that cut and fill slopes and roadbeds themselves would never produce as much timber as the previously undisturbed site. However, the roads would assist forest managers in improving the productivity of adjacent lands.

IRREVERSIBLE AND IRRETREIVABLE COMMITMENT OF RESOURCES

Conversion of land into roads is an irreversible and irretrievable commitment of resources unless the roads are obliterated.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Road restrictions necessary for the protection of wildlife prevent full utilization for other purposes such as recreation and firewood cutting.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

No conflicts are expected if Forest Plan standards are followed. There will always be differences of opinion about restrictions on individual roads.

2. Low Standard, Temporary Roads

GENERAL INFORMATION

Low standard, temporary roads are best used in areas where acess to resources for management over the long-term is not needed and where environmental, primarilly soils and geotechnical, conditions allow for the use of a low standard road. If obliteration is specified for a proposed road, obliteration would accomplish the following:

1) natural slope would be re-created through the replacement of soil and rock within the road prism;

2) road would be revegetated with conifers and grass species;

3) and if needed, barriers would be placed at junctions with other roads to deter vehicle access.

During an interdisciplinary team meeting, held on November 9, 1992, the Swiftwater Area Transportation Plan (ATP) was analized to determine the future use of each proposed road within the Upper Swiftwater analysis area. The future use of each road determines to what

standard that road would need to be constructed. The sequence of questions below were asked for each road proposed within the analysis area:

1) Is the road needed for long-term forest resource management?

   a) **YES** - road should be a permanent system road constructed to full specifications (stop).

   b) **NO** - go to 2.

2) Do the environmental conditions allow the use of a low standard road and temporary road?

   a) **YES** - road should be built to lowest standard possible while providing for protection of other resources.

   b) **NO** - See 1a

Table 4.17, following, shows the determination of the questions above for each proposed road.

TABLE 4.17 - DETERMINATION OF LOW STANDARD, TEMPORARY ROAD USE

ROAD # OR SEGMENT	ACCESS TO UNIT #	LONG-TERM USE?	CON-STRUCTION PROPOSED	COMMENTS
470E	1	YES	RECONST	Reconstruction would correct existing drainage problems on this road.
470E1	3	YES	CONST	Extending the 470E road would require new construction. The area is wet which is prohibitive to the use of temporary roads.
470E SPURS	1 and 3	NO	TEMP	Obliterate after use.
470F	2	NO	TEMP	Must be built to full specifications to provide for water crossing. Can be obliterated after use.
1119A1	4 and 5	YES	CONST	Road is needed for long-term management of adjacent resources.
1119D	6	YES	RECONST	This road is hardly visible on-the-ground and is nearly impassible to even motor-bikes at this time. The location of the road is poor with potential for failure. It would be preferred to construct road 1119G where resource potection can be assured.
9723D	9 and 10	YES	CONST	This area is steep with water crossings which would prohibit the use of a tempo-rary road.
1119A2	5	YES	CONST	Slope concerns prohibit use of temporary road.
1119G	6	YES	CONST	This road would be constructed nearly parallel to the (somewhat) existing 1119D road. Placing the road at this location rather than reconctructing 1119D is preferred.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Table 4.17 has shown the type of road construction necessary to provide for resource protection as determined by the Interdisciplinary team. The environmental effects of building roads are discussed in other sections of this chapter, specifically sections B. Elk Habitat and C. Soils, Watershed, and Fisheries.

INDIRECT AND CUMULATIVE EFFECTS

Indirect and cumulative effects of road building are discussed in other sections of this EIS particularly section B. Elk Habitat and C. Soils, Watershed, and Fisheries.

MITIGATION REQUIRED

1. Road construction/reconstruction would be designed to minimize disturbance to the existing soil and vegetation conditions. Major reconstruction would be specified in those cases where it is demonstrated that long-term improvement in conditions would result from this level of activity. Anticipated sediment yields from new road construction or major reconstruction would be mitigated to the 80% level. The Forest Plan requires mitigation of sediment yields to a 60% level as a minimum; the additional measures involved in building to the 80% mitigation level would continue to promote an upward trend in the fish/water quality conditions in Swiftwater Creek. The following mitigation measures are necessary to obtain 80% mitigation of sediment yields.

   a) Designed and controlled cut slopes, fill slopes, road width, and road grades.

   b) Designed and controlled ditches, cross drain spacing, and culvert discharge.

   c) Stabilization of road surface and ditch lines with over a six percent grade with rock of sufficient size and strength to protect channel bottoms from scouring.

   d) Installation of slash filter windrows at the base of fill slopes and below culverts where fish passage is not required. In areas where suitable material for the construction of slash filter windrows is not readily available; material to construct slash filter windrows in critical areas of exposed soil and near live water crossings will be brought in or suitable substitute material will be installed.

   e) Culvert installations at all live streams will be dewatered; that is, the stream will be diverted while the culvert is being installed. No temporary culverts will be installed.

   f) Installation of temporary strawbale sediment traps below all culverts placed in intermittent or perennial first order stream channels.

   g) Final road maintenance will be performed following completion of tree planting.

2. Should the need arise for the authorization to haul logs down (northwest) Road 470 from Road 470C to the Selway River Road, reconstruction/reconditioning work would be implemented to provide for safety and maintenance as well as enhance the long-term upward trend of Swiftwater Creek:

   a) Vegetation (primarily brush species) should be removed to increase sight distances, but would occur only where needed.

   b) Turnouts would be reconstructed/constructed at such interval to allow for safe passage of large trucks.

   c) Appropriate drainage structures would need to be installled to accomodate the increased traffic and heavy loads associated with timber harvest activities.

   d) Crushed rock would be applied where needed to reduce erosion and sedimentation.

   e) All work would be within the existing prism of the road; no previously undisturbed areas would be affected.

f) Additional signing would be required at both ends of Road 470 warning forest visitors of the logging traffic.

MONITORING REQUIRED

The Forest Plan requires that mitigation measures used for and impacts of transportation facilities on resources be monitored (Forest Plan Chapter V, page 7 and Appendix 0, page 16).

SHORT-TERM USE vs. MAINTENENCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Construction of roads has a long-term effect on vegetative productivity in that cut and fill slopes and roadbeds themselves would never produce as much timber as the previously undisturbed site. However, the roads would assist forest managers in improving the productivity of adjacent lands.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Conversion of timbered land into roads is an irretrievable commitment of resources. However, it is not an irreversible commitment of the resources as any road proposed within this analysis could be obliterated after use.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Road construction produces the most sediment of any activity on this National Forest. Mitigation is applied to keep this sedimentation to a minimum, roads are maintained and monitored annually to prevent massive losses of sediment. The mitigation that would be applied to proposed roads should keep sedimentation and other resource damage to a minimum and within Nez Perce Forest Plan Standards. However there would be an amount of sediment that may reach streams which cannot be avoided.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, AND CONTROLS

Given the mitigation required in this EIS and the Forest Plan no conflicts are expected.

G. Social and Economic

Social and economic impacts of implementation of the Forest Plan are found in Chapter II, pp. 151-162 of the Forest Plan EIS. It was recognized that the most critical factor in local economic vitality would be a drastic change in timber outputs (p. 160). The growing importance of the tourism/recreation industry was also acknowledged (p. 161).

The issue of clearcutting has been addressed in Chapter 2 section II.A.5 and Chapter 3 section II.D and II.G and also Chapter 4 sections II.D and II.G. It is difficult to address this issue in one place as it involves many different aspects; emotional, biological, visual, and ecological. The reader should reference the above mentioned document sections for further information.

National, regional, and local direction requires the use of science in the management of National Forests. The silvicultural diagnosis in Chapter 2, Table 2.1, shows the scientific process used to determine the silvicultural treatment for individual stands within the Upper Swiftwater analysis area. Even though science has been used, this proposed clearcutting will likely not be acceptable to individuals who do noy like clearcutting and should be considered an **adverse effect that cannot be avoided.**

1. Economics

GENERAL INFORMATION

Alternatives were analyzed from the perspective of economic efficiency and sale viability. Three models were used to assist in the economic analysis; DLOG, TECALC, and PNV. The user guides and model descriptions for DLOG and TECALC are contained in the project file along with all input/output data. The models' purposes and functions are summarized below.

DLOG- Delivered Log Price

DLOG analyzes input data to estimate average delivered log price, average logging costs, purchaser's credit (for roads), stumpage, and value/cost ratio at the time a sale would be sold. The value/cost ratio gives an indication of the potential of a given timber sale selling. Value/cost ratios greater that 0.8 typically have a better chance of selling than those with lower value/cost ratios (value/cost ratio should not be confused with revenue/cost ratios). Data analyzed in this model includes; harvest unit size, volume and species; type and distance of road construction; and type of silvicultural and harvest systems.

TECALC- Transactual Evidence Calculation

TECALC uses similar input data as DLOG to calculate base rates, specified road costs, and estimated high bid for a timber sale. The information gained from TECALC is then used to adjust the stumpage values given by DLOG.

PNV- Present Net Value

Information from both DLOG and TECALC is input to PNV which calculates the present net value and revenue/cost ratio for each proposed alternative. Below-cost timber sales will have a revenue/cost ratio below 1.00 and those above 1.00 will generate income for the US Treasury and local communities through the 25% fund.

Other than the 25% fund, there is no guarantee of income to the local economy. The Forest Service cannot dictate that a timber sale purchaser be local and therefore there is no assurance that this timber sale could support the local economy.

Calculations of PNV are based on estimated sale length and 4% interest rate.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

The models described above were used to analyze the economic viability of the proposed alternatives. The table below summarizes information from DLOG and TECALC which gives an indication of sale viability.

TABLE 4.18- SUMMARY OF SALE VIABILITY

ALTERNATIVE	DLOG VALUE/ COST RATIO	CHANCE OF SELLING	TECALC GROSS VALUE ($$/MBF)	BASE RATES ($$/MBF)	BD AND MNTC COSTS ($$/MBF)	STUMPAGE VALUE ($$/MBF)
2	1.04	GOOD	$182.00	$33.00	$25.00	$155.00

TABLE 4.18- SUMMARY OF SALE VIABILITY (continued)

ALTERNATIVE	DLOG VALUE/ COST RATIO	CHANCE OF SELLING	TECALC GROSS VALUE ($$/MBF)	BASE RATES ($$/MBF)	BD AND MNTC COSTS ($$/MBF)	STUMPAGE VALUE ($$/MBF)
3	1.03	GOOD	$164.00	$34.00	$32.00	$132.00
4	0.99	GOOD	$122.00	$33.00	$34.00	$87.00
5	1.03	GOOD	$184.00	$33.00	$25.00	$157.00
6	1.02	GOOD	$161.00	$33.00	$28.00	$131.00

The value/cost ratio is determined by the average delivered log price divided by the toatl estimated cost of the timber sale. Again, a value/cost ratio above 0.80 should be considered an economically viable timber sale with good chances of selling.

The discounted net revenues were calculated to determine whether or not proposed alternatives were economically feasible, that is above or below-cost. Timber sales with positive present net revenues, or a revenue/cost ratio greater than 1.00, would provide income for the local communities. The table below showns the present net revenues for each of the alternatives.

TABLE 4.19- SUMMARY OF PNV BY ALTERNATIVE

ALTERNATIVE	TOTAL DISCOUNTED REVENUES	TOTAL DISCOUNTED COSTS	TOTAL PRESENT NET VALUE	REVENUE TO COST RATIO	PNV/AC	PNV/MBF
2	$1,424,915	$1,035,457	**$389,458**	**1.38**	$1,221	$44
3	$615,037	$495,940	**$119,097**	**1.24**	$673	$29
4	$1,395,396	$1,307,083	**$88,313**	**1.07**	$191	$7
5	$1,314,795	$919,905	**$394,890**	**1.43**	$1,410	$49
6	$1,470,019	$1,151,990	**$318,029**	**1.28**	$883	$31

Alternative One- No Action

This alternative propses no timber harvest, without timber harvest there would be no timber sale generated income to the Forest Service or local communities. If calculated, the revenue/cost ratio would be negative due to the costs to the Forest Service to analyze the proposed action.

Alternative Two- Proposed Action

This alternative proposes to harvest 8.9 MMBF of timber, approximately 67% of the maximum volume that could be harvested. It has the second highest (below alternative 5) revenue/cost ratio of 1.38 and the highest value/cost ratio of 1.04. It would create approximately $356,000 for

the local communities through the 25% Fund (25% of gross revenues paid in leiu of taxes) spread over years 1993 through 1997.

Alternative Three-

Alternative three would harvest approximately 4.1 MMBF of timber, the least of the action alternatives proposed and about 31% of the maximum. It has the second lowest (above alternative 4) revenue/cost ratio of 1.24 and a value/cost ratio of 1.03. It would create the least amount of money from the 25% fund with approximately $154,000 over years 1993 through 1995.

Alternative Four-

Alternative four would harvest approximately 13.1 MMBF of timber, the maximum volume proposed in any of the action alternatives. It has the lowestt revenue/cost ratio of 1.07 and the lowest value/cost ratio of 0.99. It would create approximately $349,000 over years 1993 through 1998 for the 25% Fund.

Alternative Five-

Alternative five would harvest approximately 8.0 MMBF of timber, about 61% of the maximum volume proposed. It has the highest revenue/cost ratio of 1.43 and a value/cost ratio of 1.03. It would create approximately $329,000 over years 1993 through 1996 for the 25% Fund.

Alternative Six-

Alternative six would harvest approximately 10.4 MMBF of timber, about 80% of the maximum volume proposed. It has the third highest revenue/cost ratio of 1.28 and a value/cost ratio of 1.02. It would the highest dollar amount for the 25% Fund with approximately $368,000 over years 1993 through 1997.

INDIRECT AND CUMULATIVE EFFECTS

Should the no action alternative be selected, the local communities would not benefit from revenues collected through the 25% Fund. In the recent past the Nez Perce National Forest has provided approximately $XXXXXX annually to the 25% Fund which supports local schools, roads, and public services. The selection of any action alternative would provide some money to the 25% Fund, although at varying amounts. As well an action alternative may provide the local timber industry with raw wood products which would create jobs supporting the local economy. However, purchase of a timber sale by a local business cannot be guaranteed.

MITIGATION REQUIRED

No mitigation is required.

MONITORING REQUIRED

The accuracy of the models used should be monitored and adjusted is response to local conditions. This monitoring would be informal.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Effects of individual projects on the overall social and economic environment are difficult to quantify with accuracy. If no timber harvest is scheduled in the Swiftwater Creek area and the

resultant shortfall in the forestwide allowable sale quantity cannot be made up somewhere else (which is increasingly likely), there is a real possibility that some industry jobs could be lost. All alternatives except for Alternative 1 provide for timber harvest.

All alternatives are consistent with the Forest Plan goal of maximizing net public benefit. Initiation of forest management practices in the area would help assure an adequate long-term sustained yield of timber Forestwide, which would in turn help assure long-term economic stability.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None knoen or suspected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

None identified.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS. POLICIES, AND CONTROLS

None identified.

H. Air Quality

GENERAL INFORMATION

All action alternatives propose post-harvest site preparation and fuels reduction through burning. The method of burning was selected site specifically for each of the alternatives taking into acount access, silvicultural objectives, wildlife objectives, soil and water concerns, effects on flora/fauna, social/political concerns, topography, weather, fuels (arrangement, type, amount, etc.), and economics. The three methods of fuel treatment that would be used to accomplish site preparation, reduce fuel loading, and permit wildlife browse and/or movement are defined below.

Broadcast burning, the usual method utilized in clearcuts, is the spreading of fire through a continuous fuel cover over the unit being treated. This method has the highest potential for good smoke dispersion because of the convective column that usually occurs with this type of burn.

Understory burning is typically used in shelterwood, seed tree, and other units where a number of trees are remaining or objectives dictate. The objective is to reduce fuel loading and provide planting sites while still protecting the residual overstory trees from damage due to heat and flames. Burning is cooler and slower which means combustion can be somewhat inefficient resulting in poor smoke dispersion.

Grapple-pile and hand-burning have the least effect on air quality. Woody debris is gathered and piled mechanically or by hand throughout a unit, or portions of a unit. Piles are burned in the late fall after a season of curing, which combined with the physics of pile burning, results in an efficient combustion process with less smoke emissions.

Mastication of slash involves the use of a *Slash Buster* or other such tracked machinery were slopes are generally less than 45%. This method of slash treatment reduces slash at individual tree planting spots by "chewing up" the slash in much the same way as a lawn mower cuts grass. Mastication was considered for all proposed harvest units: topography (slope) of these units limits the usefullness of this method.

Smoke plume trajectory and dispersion of smoke varies due to climatic conditions such as time of year, atmospheric instability, and prevailing weather patterns. Burning would be conducted during weather and fuel moisture favorable for keeping prescribed fires controlled while also limiting adverse effects from smoke.

A principle objective of the North Idaho Smoke Management Agreement is to "minimize or prevent the accumulation of smoke in Idaho to such a degree as is necessary to protect State and Federal Ambient Air Quality Standards when prescribed burning is necessary for the conduct of accepted forest practices...."

The North Idaho group currently uses the services and procedures of the Montana State Airshed Group. The procedures used by the Montana Group are considered Best Available Control Technology (BACT) by the Montana Air Quality Bureau for major open burning in Montana. A Missoula-based monitoring unit is responsible for coordinating prescribed burning in North Idaho during the months of September through November. This unit monitors meteorological data, air quality data, and planned prescribed burning; then makes a decision daily on whether or not any restrictions on burning are necessary the following day.

The pollutant of concern from prescibed burning is particulate matter. Particulate material released into the air as a result of logging residue burning can have adverse effects on visibility and public health. Paticulate matter is measured in the ambient air as PM-10 or those particles that are less than or equal to 10 micrometers in diameter. The emission of particulate matter is usually given as a range that can be produced by 1 ton of a certain fuel type under certain conditions. The informatin below comparing the alternatives shows the average emmision factor/ton of fuel and the total PM-10 estimated for a given alternative. National Ambient Air Quality standards allow a maximum concentration of PM-10 emissions of 150 micrograms/cubic meter within a 24 hour period and a yearly average of 50 micrograms/cubic meter of air. The emission of particulate matter is related to a variety of factors. Some of these include fuel moisture, atmospheric stability, season, time of ignition, duration of event, fuel characteristics, fuel arrangement and age, weather features, and method of burning being conducted. The concentration of particulates at locations in the airshed is influenced by what other activites are going on in the airshed, and by current or changing climatic conditions. Although we lack tools to predict exact values or effects on air quality potential concentrations in the airshed at any one time are regulated through compliance with the procedures of the North Idaho Smoke Management Memorandum of Agreement, as outlined in the Mitigation discussion below.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Common to All Alternatives

Implementation of any of the action alternatives would produce particulate emissions from fuel treatments that would adversely effect air quality for a short duration. Particulate material emissions could temporarily impair visibility in the Selway-Bitterroot Wilderness, but if burning is done under the North Idaho Smoke Management Agreement, the smoke should be rapidly dispersed. Burning when the wind is towards the Hells Canyon National Recreation Area would not occur, as that type of flow is usually indicative of the passage of a cold front. The amount of sulfur dioxide produced from woody debris burning would be negligible, as would the amounts of carbon monoxide, ozone, nitrogen, dioxide, and lead.

The table below shows acres and type of proposed burning, the average woody debris per acre to be treated and estimated total PM-10 emissions by alternative.

TABLE 4.20- COMPARISION OF FUEL TREATMENTS AND EMISIONS BY ALTERNATIVE

ALTERNATIVE	BROADCAST BURN (ACRES)	UNDERSTORY BURN (ACRES)	GRAPPLE-PILE W/HAND BURN (ACRES)	AVERAGE WOODY DEBRIS (TONS/ACRE)[1]	ESTIMATED TOTAL PM-10[2]
2	195	80	34	46	57
3	97	80	0	43	31
4	275	150	34	45	83
5	157	80	34	46	49
6	237	80	34	47	65

[1] AVERAGE WOODY DEBRIS IS A WEIGHTED AVERAGE OF ESTIMATED FUEL CONSUMPTION FOR EACH BURN TYPE.

[2]TOTAL PM-10 IS CALCUALTED BY MULTIPLYING ACRES * AVE. WOODY DEBRIS/AC * EMMISIONS FACTOR.

Alternative One- No Action

The no action alternative would not manage fuels with burning or any other method. Without the use of fire there would not be any effect on the local air quality by smoke attributable to this proposal.

Alternative Two- Proposed Action

This alternative would create approximately the mean amount of emissions from burning, with altenatives 4 and 6 having greater and alternatives 3 and 5 less.

Alternative Three-

Alternative three would create the least amount of emmisions and thus would have the least effect on local and regional air quality. Short-term impacts to local air quality would occur, but would be mitigated as shown below to limit the adverse effects.

Alternative Four-

Alternative four has the greatest chance of causing adverse impacts because it treats the most acres of fuel and produces the greatest total quantity of particulate emissions.

Alternative Five-

This alternative would create the second least amount of particulate emissions, above alternative 3.

Alternative Six- Preferred Alternative

This alternative, with 237 acres of proposed broadcast burning, would create the second highest amount of particulate emissions.

MITIGATION REQUIRED

All action alternatives would require the following mitigation measures:

1) Procedures outlined in the North Idaho Smoke Management Memorandum of Agreement will be followed and restrictions imposed by the Monitoring Unit would be accepted.

2) No burning is planned that is not needed to meet silvicultural, fuel management, or wildlife habitat objectives. All units requiring broadcast burning or understory burning will be reviewed by the Fire Management Officer, Fuels Specialist, and/or District Silviculturist after harvest to determine to what extent burning is needed to reduce fuel loading for hazard reduction and site preparation requirements. Any modification to the Slash Treatment Plan would be handled through the Timber Sale Contract and documented in the Silvicultural Prescription. Any significant changes in treatments that could change the the scope of the environmetal effects displayed here would require a supplement to this EIS.

3) Broadcast burning and understory burning would be conducted only in the spring (if possible) when duff and 1000-hour fuel moistures are high to offer greater resource protection; there is less competition in the airshed and climatic conditions favor smoke dispersion. If unable to complete in the spring due to lack of windows, would need "spring-like" conditions when burning at other times.

4) Restrictions on prescribed burning for local air quality reasons may be implemented by the Selway Ranger District in addition to those imposed by the Smoke Management Monitoring Unit.

5) The Smoke Management Forecast will be used to determine burn days when the transport winds will carry the smoke away from the Selway-Bitterroot Wilderness area.

6) There shall be no more than 100 acres maximum ignited in one single day to permit natural dispersion of smoke to occur and better natural cleansing of the air.

7) To control dust roads may be watered or otherwise treated during construction and harvest activities to reduce dust emissions.

MONITORING REQUIRED

No formal monitoring of air quality is required by the Forest Plan.

SHORT-TERM vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

There would be a short-term impact to the local air quality which may be objectionable to some people. This impact would be minimized though the implmentation of the mitigation required above. The purpose of the activity which create a short-term decrease in air quality is to create more open soil space on the harvested sites to allow for tree planting as well as reduce the fuel loadings that may be a fire hazard.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None are expected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Smoke from prescribed fire would temporarily reduce air quality, which could have short-term impacts on recreation, visual quality, and wilderness.

CONFLICTS WITH OBLECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, AND CONTROLS

Potential conflicts could exist between Nez Perce Forest prescribed burning needs and Idaho air quality standards. However, such conflicts would be unlikely, since all prescribed burns on the Forest would be managed to comply with the North Idaho Smoke Management Memorandum of Agreement, which is designed to avoid such conflicts.

III. DISCUSSION OF EFFECTS TO OTHER RESOURCES

A. Wildlife Management Indicator Species

GENERAL INFORMATION

The Nez Perce Forest has designated management indicator species (MIS) (Forest Plan EIS, Chapter III, pp. 35-37). These species are identified and selected because their population changes are believed to indicate the effects of management activities [36 CFR 219.19(a)(1)]. The species identified in the Forest Plan EIS as MIS are Bald Eagle, Grizzly Bear, Gray Wolf, Peregrine Falcon, Elk, Moose, Bighorn Sheep, Pileated Woodpecker, Goshawk, Pine Martin and Fisher. Of these species the Bald Eagle, Grizzly Bear, and Gray Wolf have already been discussed earlier (section II. E.1.a) as threatened or endangered species. The Fisher has been discussed in section II.E.1.b. As well, Elk have been discussed in section II.B. The remaining species; Moose, Bighorn Sheep, Peregrine Falcon, Pileated Woodpecker, Pine Martin, and Goshawk will be discussed here.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

No alternative would have significant advers effects to any of the above mentioned management indicator species.

MITIGATION REQUIRED

As mentioned in Chapter 3, a Goshawk nest is located within the Upper Swiftwater analysis area. This nest is well away from proposed activity and does not require mitigation for protection. Should an active goshawk nest be discovered within an planned timber harvest unit, action will be taken to minimize effects of logging to the nest. This may be done by either buffering (removing a portion of the harvest unit from harvest or by rescheduling harvest outside of the nesting/brooding season). Prior to taking any action, the site specific conditions will be evaluated by Forest Service Wildlife Biologists and interdisciplinary team to develop appropriate migitating recommendations to the Line Officer and Contracting Officer.

INDIRECT AND CUMULATIVE EFFECTS

The Elk, Threatened, Endangered, and Sensitive Wildlife, and Biological Diversity, Fragmentation and Ecosystem Mnagement sections of this document discuss cumulative efftects to vegetative patterns through implementation of an action alternative. The cumulative effect to wildlife through changing vegetative patterns in not known.

MONITORING REQUIRED

All MIS will be monitored in accordance with the Forest Plan Chapter II-18(3) and evaluated annually.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Please see Indirect and Cumulative discussion above.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

There would be no irreversible of irretrievable commitment of resources unless a conflict develops between human activity and the viability of any of the MIS species. If that happens, further analysis would be done to resolve the conflict.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Additional roads would be constructed. Vegetation would be altered in places and human presence would increase which may impact MIS species. These effects would be mitigated but not eliminated.

CONFLICTS WITH OBLECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, AND CONTROLS

None are expected.

B. Recreation

This section is seperated into two sections; 1) Recreation Opportunity Spectrum and 2) Recreation Resources and Activities.

1. Recreation Opportunity Spectrum

GENERAL INFORMATION

The Upper Swiftwater analysis area has been classified into three Recreation Opportunity Spectrum (ROS) areas; roaded natural, roaded modified, and semi-primitive non-motorized. Management implications of these areas are discussed in Chapter Three of this EIS.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

All action alternatives propose timber harvest and some road construction. These activities would affect the ROS classification acreages within the Upper Swiftwater analysis area as showb in the following table.

TABLE 4.21- CHANGES IN ROS ACRES BY ALTERNATIVE

		ACRES AFTER ALTERNATIVE IMPLEMENTATION					
ROS CATERGORY	EXISTING ACRES	1	2	3	4	5	6
SEMI-PRIMITIVE, NON-MOTORIZED	730	730	240	730	0	240	0
ROADED NATURAL	115	115	115	115	115	115	115
ROADED MODIFIED	3200	3200	3690	3200	3930	3690	3930

Alternative 1- No Action

The no action alternative would not change the Recreation Opportunity Spectrum acres identified in Chapter Three

Alternative Two- Proposed Action

This alternative proposes to harvest approximately 239 acres within the roaded modified portion of the analysis area. This proposed harvest would not change that ROS classification for those areas. This alternative also proposed to harvest 70 acres within the semi-primitive, non-motorized portion of the analysis area (units 9 and 10). This proposed harvest would convert approximately 490 acres of the semi-primitive, non-motorized portion to roaded modified ROS classifications.

Alternative Three- Proposed Action

This alternative would harvest approximately 177 acres within the roaded modified portion of the analysis area. The proposed harvest would not change the ROS classifications.

Alternative Four-

This alternative proposes the most harvest activity with a total of 459 acres. 140 acres of this lies within the semi-primitive, non-motorized area (units 9, 10, 11, and 14). This proposed harvest would convert the entire semi-primitive, non-motorized portion of the analysis area to roaded modified.

Alternative Five-

This alternative proposes to harvest 201 acres of the roaded modified area and 70 acres of the semi-primitive, non-motorized area. The proposed harvest would decrease the semi-primitive,

non-motorized area by approximately 490 acres. These acres would be converted to roaded modified.

Alternative Six- Preferred Alternative

Similar to alternative four this alternative proposes to harvest 140 acres within the semi-primitive, non-motorized area (units 9, 10, 11, and 14). This proposed harvest would convert the entire semi-primitive, non-motorized portion of the analysis area to roaded modified. The other 201 acres of proposed harvest would not change the roaded modified classification.

MITIGATION REQUIRED

The Nez Perce Forest Plan page II-2 identified that semi-primitive ROS area would decrease and that roaded ROS areas would increase. No alternative would require mitigation to maintain the ROS classes identified.

MONITORING REQUIRED

Acres of ROS classes are being continuously monitored and will be evaluated during the 5 year review of the Forest Plan (Forest Plan Chapter 5 page 6 [36 CFR 219.12(k)(1)] and Appendix O pages 1-2.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

No conflicts identified.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None are expected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

None are expected.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None are known or suspected.

2. Recreation Resources and Activities

GENERAL INFORMATION

This section will discuss effects on trail use, activities within the river corridor and hunting opportunities within the analysis area.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Effects Common to All Alternatives

TRAILS

All alternatives would close the Hot Point trail (#706) yearlong to all motorized vehicles. This trail cannot sustain motorized use in its current condition and there are no plans to improve the trail for such use.

The Swiftwater Crosscut trail (#716) would be bisected in all action alternatives by proposed harvest unit #4. This portion of the trail will be listed as a "protected improvement" on the Sale Area Map and identified on-the-ground. During activity on the proposed timber sale the identified portions of the trail tread within the cutting units would be protected from excessive damage.

RIVER RECREATION

No alternative would directly effect recreation along the river corridor; no harvest activities would be visible from the river nor would there be log truck traffic on the Selway River road #223.

HUNTING OPPORTUNITIES

All action alternatives would increase human access to areas that were previously closed to all but the most adventurous. Although all proposed roads would be closed to all motorized vehicles, year-round foot and horse traffic would be allowed. This increased access may improve hunting and disperesed recreation opportunities.

MITIGATION REQUIRED

To maintain existing dispersed recreation opportunities:

1) Maintain motorized access to the dispersed site and trailhead at the junction of Roads #1119 and #9723 and to the dispersed site at the junction of Roads #470 and #1119.

2) Avoid using identified sites as landings, truck turnouts, or temporary roads.

3) When existing sites must be affected by sale activities, reconstruct or enhance the sites through KV or other collections.

To improve and mitigate trails in the analysis area:

1) Trails #706 and #716 would be identified as opportunities for improvement in the KV Plan. Work associated with these projects would include reconstruction, relocation, and maintenance. Funds for these trails would be collected through KV or other funds.

2) Trail 706 will be buffered from proposed harvest activities.

3) At locations where road construction crosses Trail 706, provisions will be incorporated in to the road design to accommodate the trail crossing.

4) Trail #716 will be listed as a "protected improvement" on the Sale Area Map. During activity on the proposed timber sale the identifiable locations of the trail tread within the cutting unit #4 will be protected from excessive damage.

MONITORING REQUIRED

All recreation is monitored by five-year reporting periods as required in the Forest Plan Appendix O pages 1-2.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

Short-term use of both trail numbers 706 and 716 would be affected by the proposed activities. The long-term use of these trails would be improved through the collection of KV dollars for improvement work on these trails.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None are expected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

See discussion above on short-term vs. long-term management.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None are expected.

C. Noise

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Alternative One- No Action

No increase in noise levels associated with man's activity would occur under this alternative.

Alternative Two- Proposed Action

This alternative proposes only conventional harvest systems (tractor and skyline); no helicopter harvest is proposed. Noise from this alternative would be most noticable in the vicinity of the harvest units and during the summer months when logging activities would be most active. The increased noise levels could be expected to last for approximately four years.

Alternative Three-

Like alternative two, this alternative proposes only conventional harvest systems (tractor and skyline); no helicopter harvest is proposed. Noise from this alternative would be most noticable in the vicinity of the harvest units and during the summer months when logging activities would be most active. The increased noise levels could be expected to last for approximately two years.

Alternative Four-

This alternative proposes conventional and helicopter harvest systems. The noise associated with helicopter logging is more noticable than the noise of conventional logging methods but would also be concentrated around the active harvest areas. This alternative would take approximately five years to completely harvest and the proposed 8.6 MMBF of helicopter volume could be easily harvested within two years.

Alternative Five-

Like alternatives two and three, this alternative proposes only conventional harvest systems (tractor and skyline); no helicopter harvest is proposed. Noise from this alternative would be most noticable in the vicinity of the harvest units and during the summer months when logging activities would be most active. The increased noise levels could be expected to last for approximately three years.

Alternative Six- Preferred Alternative

Like alternative four, this alternative proposes conventional and helicopter harvest systems. The noise associated with helicopter logging is more noticable than the noise of conventional logging methods but would also be concentrated around the active harvest areas. This alternative would take approximately four years to completely harvest and the proposed 2.5 MMBF of helicopter volume could be easily harvested within one year.

INDIRECT AND CUMULATIVE EFFECTS

None are expected.

MITIGATION REQUIRED

No mitigation for noise control would be implemented for any of the alternatives.

MONITORING REQUIRED

No monitoring is required by the Forest Plan and no monitoring is proposed by this EIS.

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

None are expected.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None are expected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

If an action alternative is selected there is no way to mitigate the noise associated with timber harvest activities. This type of noise is not acceptable to some Forest visitors.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None are expected.

D. Cultural Resources

GENERAL INFORMATION

Cultural resources may be identified as those resources either directly or indirectly related to the material lifeways of a cultural group, or groups, as specified by the Code of Federal Regulations (CFR), 36 CFR 296.3. Cultural resources may refer to sites, buildings, structures, districts, and objects as determined by the USDA Forest Service CRM Handbook, Chapter 5, page 6. Such resources may possess significant scientific, socio-cultural and historic/ prehistoric values. Cultural resource significance, i.e. National Register of Historic Places (NHRP) eligibility, shall be determined by a trained, professional archeologist in consultation with the State Historic Preservation Officer (SHPO).

Cultural resources are non-renewable resources. As such, Federal regulations have been passed which prohibit destruction of significant cultural sites and require the management of cultural resources by Federal Agencies, such as the USDA Forest Service. The Antiquities Act of 1906, the Historic Sites Act of 1935, the National Historic Preservation Act of 1966, the Archaeological and Historic Preservation Act of 1974, the Archeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990 exemplify the long and progressive history of regulations concerning the protection of significant archeological resources.

As stated in Chapter Three of this EIS, significant or NRHP eligible cultural resource properties (CRP's) do exist within the Upper Swiftwater analysis area. Areas of high probability for the presence of additional CPR's also exist. As such, potential for specific project related impacts to cultural resources exists on a selected alternative basis.

Final determination of effects to cultural resources is contingent on the selected alternative. The location of related specified ground disturbing projects, i.e. road construction, logging operations, etc. will determine the effects. Coverage of previously unsurveyed areas will be performed in compliance with the NHPA Section 106 Process. Survey methods will include walking transects and visual assessment of project specific direct effect areas; 100% of high cultural site probability areas will be inventoried.

Prior to project implementation project specific cultural resource inventory surveys would be completed and would document located cultural sites and assess potential project related impacts upon CRP's. CRP significance, i.e., NHRP eligibility, will be determined by Forest Service Cultural Resource Specialist consultation with the (SHPO). Mitigation measures will, in cases where significant CRP's fall within project areas, be recommended in order to achieve a "no adverse effect" determination of effects. All inventory reports will be submitted to the SHPO and, in cases necessitating mitigation, to the Advisory Council on Historic Preservation (ACHP) in completion of the NHPA Section 106 Process.

Logging operations and road construction projects present the possibility of having an "adverse effect" in areas containing significant cultural resources. In an "adverse effect," worst case scenario, reprimand as specified under 36 CFR 296.14 through 296.17 will be effective. Alternatively, where significant CRP's are identified within specific project boundaries, mitigation measures resulting in a "no adverse effect" determination will be recommended. Both the SHPO and the Advisory Council on Historic Preservation (ACHP) will be consulted during site mitigation in complience with the Section 106 Process. Unless previously inventoried, alternative-based

project specific cultural resource survey will be carried out and potential impacts will be assessed prior to project implementation.

DIRECT EFFECTS COMPARED BY ALTERNATIVE

Specific timber plan alternatives associated with the Swiftwater Analysis may be rated for cultural resource management (CRM) favorability, based on potential for adversely affecting CRP's. Three factors (those most gound disturbing) are considered here, with regards to comparative impact potential: 1) tractor skidding acreage; 2) road construction mileage; and 3) skyline yarding acreage. Cultural resource effects analysis is based upon an inter-alternative comparative analysis of these factors. Swiftwater Analysis alternatives are listed below in order of increasing risk to cultural resources.

Alternative One- No action

The no action alternative proposes no ground disturbing activity and represents no effect to CPR's. There are no potential mitigation requirements associated with this alternative. (CRM preferred Alternative).

Alternative Three-

This alternative proposes the least amount ground disturbance and least potential for mitigation requirements, as compared to Alternatives 2 through 6.

Alternatives Four, Five, Six and Two-

These alternatives propose nearly equal amounts of ground disturbing activity, with nearly equal potential for mitigation requirements. The order listed above reflects CRM favorability rating (decreasing from Four to Two) of these alternatives.

Potential direct logging and road construction impacts to archeological sites include: the total or partial obliteration of surface and subsurface features such as house pits and cabin pads; the displacement and turbation of surface and subsurface artifact deposits; the destruction of cultural materials such as lithic artifacts; and the general reduction of site integrity.

INDIRECT AND CUMULATIVE EFFECTS

Indirect impacts related to logging activities may include soil movement and destruction of cultural artifacts/features along skid trails and road cutbanks. Artifact movement results in lost provenience and integrity. Increased access to areas containing archeological sites increases the probability of recreational use related site damage, i.e. site looting, A.T.V. damage, etc. Increased area access also increases the potential for future logging operation related cultural resource impacts.

Potential cumulative impacts on cultural resources relates directly to past logging and road buliding operations in areas containing CRP's. Harvesting of trees in units previously subjected to logging related ground disturbance may cumulatively affect cultural resources in the manner specified above.

MITIGATION REQUIRED

Nez Perce timber sale contracts reserve the right to immediately halt all project activity under contract clause C6.24 upon the new discovery of cultural materials.

Avoidance would be the primary mitigation used for cultural resource protection.

MONITORING REQUIRED

Compliance with the National Historic Preservation Act is monitored at 5-year intervals (Forest Plan, Appendix O, pp.5-6).

SHORT-TERM USE vs. MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVTY

None are expected.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

None are expected.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

None are expected.

CONFLICTS WITH OBJECTIVES OF OTHER LAND MANAGEMENT PLANS, POLICIES, OR CONTROLS

None are expected.

IV. REQUIRED DISCLOSURES

A. Wetlands and Floodplains

Minor floodplains and wetlands exist within the Upper Swiftwater analysis area, particularly near the mouth Swiftwater Creek with it's confluence with the Selway River. Forest Plan standards should be adequate to mitigate any significant adverse effects and comply with Executive Orders 11988 and 11990.

B. Effects on Social Groups

There are no overall differences among the action alternatives in effects on minorities, Native Americans, or women. No civil liberties would be affected. The Nez Perce Tribe has traditional and treaty-guaranteed ties with fish and game management on the Forest, which would be protected under all alternatives.

C. Effects on Prime Farmland and Rangeland

The Swiftwater Creek area does not contain and is not adjacent to any prime farmlands or rangelands.

D. Energy Requirements and Conservation Potential of Alternatives

The energy required to implement this project is insignificant in comparison to national and worldwide petroleum consumption.

E. Forest Plan Consistency

All action alternatives are consistent with direction displayed in the Nez Perce Forest Plan. Alternative One (no action) would not meet Forest Plan direction in regards to elk habitat effectiveness. This alternative does not bring elk habitat effectiveness within the Goddard Elk Habitat Analysis Unit up to the Foest Plan level of 75%.

Chapter Five

List of Preparers

CHAPTER FIVE

LIST OF PREPARERS

CORE INTERDISCIPLINARY TEAM

Anderson, Nell - *Fisheries Biologist, Selway Ranger District*
B.S. Fisheries Science, Oregon State University, 1974.
B.S. Secondary Education, University of Montana, 1987.
With Forest Service since 1969, sixteen years forest resource management experiance including engineering, fire and fuels management, silviculture, and integrated resource management, six years fisheries biology experience.

Bateman, Steve - *Silviculturist, Selway Ranger District*
B.S. Forest Resource Management, University of Minnisota, 1973.
160 hours continuing education in Silviculture and Ecology.
Certified Silviculturist, Rocky Mountain Region, 1983.
Certified Silviculturist, Northern Region, 1987.
Certified Timber Sale Administrator, 1985.
Certified Advanced Timber Cruiser, 1979.
With Forest Service since 1974, eighteen years fire suppression and management, ten years silvicultural, eight years timber sale preparation, four years timber sale administation, and two years NEPA and appeals coordination.

Berg, Heather - *Planning Forester, Selway Ranger District. IDT Leader (from May 1992).*
B.S. Forest Resource Science, Humboldt State University, CA., 1991.
With Forest Service since 1988, 3 years timber sale preparation and wildlife management and 3 years timber sale planning and NEPA coordination.

Bird, Jerry - *Planning Assistant, Selway Ranger District. IDT Leader (to May 1992).*
B.S. Forest Resource Developement, University of Minnisota, 1975.
Forest Engineering Institute, 1980.
Marketing, 1989.
With Forest Service since 1978, five years timber sale preparation, three years timber sale administartion, timber stand improvement, engineering, and law enforcement, three years forest resource management including recreation, watershed, soils, and fisheries, and minerals, four years NEPA/NFMA coordination.

Hibbs, Andy - *Forestry Technician (Reforestation), Selway Ranger District. Para Landscape Archetech.*
B.S. Biological Science, Eastern Washington State University, 1970.
Para Visual, 1991.
Certified Advanced Timber Cruiser.
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Keck, Penny - *Fire Management Officer, Selway Ranger District.*
Portland State University, studies in Marine Biology, Physical Education/Health/Recreation.
Para Archaeologist, 1989.
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Talbert, Dennis - *Supervisory Wildlife Biologist, Selway Ranger District.*
B.S. Wildlife Management, Oregon State University, Oregon, 1971;
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Warofka, John - *Forestry Technician (Reforestation), Selway Ranger District. Botanist.*
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B.S. Botany, University of Montana, 1982.
With Forest Service since 1978, seven years timber sale preparation, seven years timber stand improvement and reforestation, and three years sensitive plant experience.

Wilkinson, Willlam - *Timber Management Assistant, Selway Ranger District. Logging Systems Specialist.*
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Chapter Six

List of Agencies, Organizations, and Persons Notified of This Statement

CHAPTER SIX

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS NOTIFIED OF THIS STATEMENT

INDIVIDUALS CONSULTED

Ben Alexander, Gamaliel AR
Wayne Claar, White Bird ID
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Donald Morrow, Grangeville ID
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Jay Shepard, Orofino ID
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Richard and Mona Fike, Kooskia ID
Tim Bernard, Boise ID
Anna Boswell, Spokane WA
Bob Flamming, Kooskia ID
Larry Jarrett, Kuna ID
Don McPherson, Kooskia ID
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George Miller, Coeur D'Alene ID
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Erik Ryberg, The Ecology Center, Missoula MT
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Appendix A

Desired Conditions for Affected Management Areas

APPENDIX A

DESIRED CONDITIONS FOR AFFECTED MANAGMENT AREAS

The following descriptions of the DFC contain a summary of the "picture" that will be created by meeting the goals set forth for each management area listed. They are described in this manner to provide a means of comparison between the existing conditions and the desired condition, and to assist in formulating treatment needs on individual stands. Only those Management Areas represented on the Analysis Area are included. Forest Plan Goals and Standards for the individual Management Areas are found in Chapter III, pages III-2 through III-57 of the Nez Perce Forest Plan.

Management Area 1

Management intent is to provide the minimum management necessary to provide for resource protection and to ensure public safety. Since these areas of "unsuitable" ground are not expected to support stands of sawtimber, they need special emphasis to protect the soil and water resources on and adjacent to them. These areas generally support a vegetative community of grasses and low shrubs, and some consist only of mossy communities on bare rock. Disturbance of this fragile ecosystem will create bare soil easily, and since these stands are generally steep, the soil will move easily into the stream system.

Target Conditions

The condition that is desired on these lands is natural stands that are monitored for impending damage and protected from such. Natural invasion of conifers on these stands will occur as site conditions become favorable. No vegetative management is anticipated at this time.

The DFC in all resource areas is governed by the physical attributes of this MA. Opportunities and habitats currently provided by these areas will change only as a result of natural occurrences. Changes from the existing condition will result from natural succession; management actions will be implemented only to insure that catastrophic changes are minimized.

Management Area 8

Management intent is to protect and enhance aesthetic, scenic, historic, fish, and wildlife, and other values that will contribute to public use and enjoyment of the free-flowing Selway river and its immediate environment. The lands in this MA are classified as "unsuitable" for timber production; therefore timber harvest has not been scheduled from this area.

Target Conditions

The conditions of stands that would meet this intent are: 1) Natural in appearance and; 2) Conditions on-site would not contribute to degradation of the stated dependent resources. No vegetative management is anticipated at this time.

Management and protection of the visual and recreational values of this MA are essential. The natural-appearing forested environment will be maintained; the adopted visual quality objective of retention requires that management activities are not "visually evident". While protected from catastrophic changes, natural environmental changes will be evident. Recreational opportunities will remain unchanged from the existing situation. The available sites for developed recreation have all been identified. These sites will be maintained, or improved, as needed; but there is little opportunity for any major new developments along the river. River and water related recreation in an essentially natural forested setting will continue to be dominant.

Wildlife habitats will be managed to provide for the needs of native species and provide viewing opportunities. By allowing primarily natural vegetative succession to dominate in this MA there will be significant portions of the area which will provide habitat for old growth dependent species. A mosaic of timber types and age classes will be encouraged to limit the risk of a single catastrophic event; fire, insect infestation, disease infection, etc., devastating the area. Evidence of habitat management, particularly the use of prescribed fire, will be noticeable but natural-appearing. Fisheries habitat in the Selway will be maintained through control of sediment in the tributary streams.

Maintenance of water quality is vital to the character of this MA. The DFC is to maintain the pure, free flowing, clear waters of the rivers. Implementing practices which insure that the tributary streams meet, or exceed, all applicable water quality standards will adequately protect the water resources in this MA. No direct instream improvements are anticipated.

Management Area 10

These riparian areas are to be managed to maintain and enhance their unique values. Riparian areas are defined as aquatic ecosystems and adjoining lands that are dominated by riparian vegetation. The natural and beneficial values of riparian areas include groundwater recharge, moderation of flood peaks, maintenance of water quality, visual and recreational enjoyment, fish and wildlife habitat, cultural resources, and timber and forage production.

Target Conditions

Maintaining all elements of a functioning riparian ecosystem is vital to the DFC of this MA. The diversity of vegetation and animal life found in riparian areas will be maintained. Prescribed changes in the riparian areas will be designed to maintain and enhance their values for wildlife, fishery and aquatic habitat, and water quality.

Timber harvest can occur within the riparian areas. This activity will only occur where it can be demonstrated that the riparian values will be protected or enhanced. A primary goal of harvesting in MA 10 will be to establish areas of regeneration which will contribute to the long-term stability and health of the riparian area. Considerations when scheduling timber harvest include:

Leaving enough large trees adjacent to the stream to provide for long-term recruitment of large logs into the stream. These logs provide pool habitat by their ability to dam small stretches of water and assist in stream stability and invertebrate habitat management.

The understory in these stands would consist of a complex riparian vegetative community that provides at least 75% shade on southerly oriented stream channels, as well as bank cover that acts as filter zones and natural sediment traps.

Many of these interconnected stands will also provide connecting corridors between old growth areas.

A forested ecosystem is a dynamic environment which progresses through time to achieve the DFC. From initial establishment of trees in the area through the subsequent growth this area will be managed to exhibit the following attributes at stand rotation age: A healthy overstory of mixed conifer species compatible with the ecological conditions found on these wet areas, with a vigorous understory of herbs, forbs and shrubs of species also compatible with site conditions. Composition would be compatible with soil and moisture conditions, with wet-site conifers such as western redcedar and Englemann spruce being preferred over more seral species such as Douglas fir, western white pine, and ponderosa pine. Native hardwoods characteristic of these sites would also be featured in the overstory, such as black cottonwood and alder. Stocking levels of mature trees may vary widely, due to soil characteristics and root-holding capacity, but minimum stocking will provide a sustained level of acting and potential large organic debris. Blowdown potential will be minimized by managing for root strength and by minimizing disturbance to both the soil resource and canopy closure.

Riparian areas are usually treated as a portion of a timbered stand when harvest is proposed. Special emphasis is necessary to assure that the riparian areas within these stands are treated beyond the general harvest prescription. Therefore, any stand that is being diagnosed for treatment needs will be compared against the target characteristics for riparian areas, if these exist within the stand.

Management of the riparian areas through timber harvesting and burning, particularly for big game habitat improvement, will result in a reduction of water quality and fisheries potential from pristine conditions. Changes to the riparian area will be planned and implemented to meet all State water

quality and Best Management Practices criteria. The fisheries and water quality requirements contained in the Forest Plan Appendix A will be met, or exceeded, in all prescription watersheds.

Many recreation uses will continue to focus on the riparian areas; unplanned development of camping and picnicking sites will be discouraged. Because of the sensitive nature of riparian areas, developed and dispersed recreation will be planned to minimize the effects on the dependent resource values. Development will be designed, as needed, into locations that can accommodate these uses without undue impacts on the riparian ecosystem.

Management Area 12

Manage for timber production and other multiple uses. Develop equal distribution of age classes to optimize sustained timber yield.

Target Conditions

A forested ecosystem is a dynamic environment which progresses through time to achieve the DFC. From initial establishment of trees in the area through the subsequent growth this MA will be managed to exhibit the following attributes at stand rotation age: An even-aged stand of mixed, primarily seral conifers. At least 50 percent of basal area occupied by seral species, maintained in a healthy and vigorous condition with limited incidence or probability of insect and disease occurrence other than natural endemic levels of these pests. Periodic annual increment will vary by site productivity, but may be expected to exceed 230 cu. ft./ year on high site cedar habitat types where optimum stocking has been maintained throughout the rotation. A rotation age of 100 years would yield from 230 to 300 square feet of basal area on 140 to 250 crop trees per acre. This variance is based on expected productivity from a warm dry Douglas-fir low end to the extremely productive Cedar habitat type. These stand attributes are reflective of maximum utilization of the site for the timber resource.

All of this MA is within elk summer range. The components of summer range habitat quality (security areas, hiding cover, travel routes, cover/forage ratios etc.), are managed at levels to meet prescribed habitat objectives. Habitat management objectives of either 25, 50, 75 or 100 per cent have been established for all summer range areas across the Forest; these objectives will be met. Habitats for other wildlife species dependent upon seral forest conditions will be adequately maintained through meeting the requirements for elk. Established minimum standards for cavity and snag dependent species, as listed in the Forest Plan, will be retained throughout the area.

Management for timber production will result in a distribution of age classes throughout the MA. Primarily seral species will be naturally and artificially regenerated in the harvest units. This will create a mosaic of timber stands providing a diversity of habitat components for wildlife dependant upon early successional stages of forest development.

The visual management objectives for MA 12 are modification and maximum modification. Timber harvesting and stand manipulation will be evident throughout the area. There will be a mixture of recently harvested areas, including clearcuts, through mature stands approaching harvest conditions. The visual character throughout the MA will be that of a commercial forest under intensive management.

Recreational opportunities in the MA will be within the Roaded Modified/Roaded Natural classification. Recreational activities in a managed forested setting are appropriate throughout the MA. Access by motorized vehicles will be controlled to insure protection and enhancement of other resource values, primarily big game security and watershed protection, however; motorized recreation opportunities will be emphasized in this MA.

To insure the productivity of the sites are maintained the effects of soil compaction, displacement, and erosion will be limited during all management activities. Insuring that all management addresses protection of the site will result in limiting the potential for soil erosion and off-site effects in adjacent riparian habitats. Water quality and quantity will be maintained at State and Forest Plan standards at all times.

The table below describes stand development by stages, following regeneration harvest leading to the rotation-age goals above:

COMMERCIAL TIMBER STAND DEVELOPMENT STAGES MA 12

Stage	Age (yr)	Stocking (trees/ac)	B.A./acre	Species	Stand structure
Seedling	1-15	250-1000	n/a	DF,L,LP,WP,PP,GF,C,S	Single story w/ old growth remnants
Sapling (2-6"QMD)	15-30	250-1000; thin to 4-800 @ 20 yr	n/a	70% DF,L,WP,PP	same
Pole (6-10"QMD)	30-50	500-800; commercial thin to 175-190		same	same
Immature Saw Timber (10-20"QMD)	50-100	Commercial Thin to 140-250	230-300	DF,L,WP,PP	same

Management Area 16

Improve big game winter range habitat through timber harvesting, prescribed burning and other management practices.

Target Conditions

A forested ecosystem is a dynamic environment which progresses through time to achieve the DFC. From initial establishment of trees in the area through the subsequent growth this MA will be managed to exhibit the following attributes at stand rotation age: An even-aged stand of mixed, primarily seral conifers. At least 50 percent of basal area occupied by seral species, maintained in a healthy and vigorous condition with limited incidence or probability of insect and disease occurrence other than natural endemic levels of these pests. Periodic annual increment will vary by site productivity, but may be expected to exceed 230 cu. ft./ year on high site cedar habitat types where optimum stocking has been maintained throughout the rotation. An extended rotation age of 120 years would yield from 230 to 300 square feet of basal area on 140 to 250 crop trees per acre. This variance is based on expected productivity from a warm dry Douglas-fir low end to the extremely productive Cedar habitat type.

These stand attributes are reflective of maximum utilization of the site for the timber resource following an extended period of herbaceous vegetation production after regeneration harvest. Visual quality objectives, and wildlife habitat objectives can be met through positioning and timing of harvest and by management detailed in the silvicultural prescription.

Forage and thermal cover would be distributed by sub-compartment. Maximum forage would be produced using dry-season, summer or fall, prescribed fires. Approximately 15-20% of the winter range would be in a forage producing condition. Timber harvest units would range from 5-40 acres and not wider than 800 feet. These forage areas will be rotated across the MA to insure that there is a continual rejuvenation of available forage. There would be a mosaic of seral brush and timber stands providing areas for feeding as well as thermal cover for elk.

This MA is completely within elk winter range elevation. By meeting the needs for forage and cover areas for elk in the area it will be possible to maintain viable habitats for other wildlife species that rely upon seral forests. Established minimum standards for cavity and snag dependent species, as listed in the Forest Plan, will be retained throughout the area.

The primary recreational opportunities that will be available within this MA are in the Roaded Natural/ Roaded Modified classifications. The topography and limited access will restrict opportunities for motorized recreation. Big game security needs will require that strict access restrictions be placed on motorized use of all local roads and trails.

The visual quality objectives for this MA are modification or maximum modification. Management activities will be readily noticeable throughout the area. Vegetative manipulation through timber harvesting or prescribed fire will dominate the landscape for short time periods.

Maintaining the productivity of the site for production of quality forage and timber production requires that soil displacement and erosion is limited in all activities. Insuring that the site productivity is protected will limit offsite effects to the adjacent riparian areas.

The table below describes stand development by stages, following regeneration harvest leading to the rotation-age goals above:

COMMERCIAL TIMBER STAND DEVELOPMENT STAGES MA 16

Stage	Age (yr)	Stocking (trees/ac)	B.A./acre	Species	Stand structure
Seedling	1-20	250-1000	n/a	DF,L,LP,WP,PP,GF,C,S	Single story w/ old growth remnants
Sapling (2-6"QMD)	20-40	Thin down to 400 to 800/ac @ 20-40 yrs	n/a	70% DF,L,WP,PP	same
Pole (6-10"QMD)	40-60	500-800	175-190	same	same
Immature Saw Timber (10-20"QMD)	60-120	Commercial thin to 140-250	230-300	DF,L,WP,PP	same

Management Area 17

Manage for sustained timber production while meeting visual quality objectives (VQOs) of "retention" and "partial retention".

A target stand to meet these goals and standards would be cultured using a silvicultural system that optimizes harvest volumes within visual quality constraints. Optimum volumes are produced at culmination of mean annual increment (cmai) with an even-age harvest method and subsequent activities that assure rapid, full stocking of fast-growing seral tree species. A prescribed VQO of Retention or Partial Retention may not be met by applying an even-age harvest method, unless sufficient, suitable leave trees are available to permit a shelterwood harvest, in seen areas. An uneven-age silvicultural system may be applied to meet either of these VQOs, if ecological conditions permit management with an uneven-age system.

Target Conditions

At maturity, stand attributes would include either an even-aged stand of mixed, primarily seral conifers, or an uneven-aged stand of primarily shade-tolerant conifers.

Within the even-age alternative, at least 50 percent of basal area would be occupied by seral species, maintained in a healthy and vigorous condition with limited incidence or probability of insect and disease occurrence other than natural endemic levels of these pests. Periodic annual increment will vary by site productivity, but may be expected to exceed 230 cu. ft./ year on high site cedar habitat types where optimum stocking has been maintained throughout the rotation. A rotation age of 100 years would yield from 230 to 300 square feet of basal area on 140 to 250 crop trees per acre. This variance is based on expected productivity from a warm dry Douglas-fir low end to the extremely productive Cedar habitat type. These stand attributes are reflective of maximum utilization of the site for the timber resource. The table on stand development under MA 12 above, reflects this type of system.

Within the uneven-aged alternative, continuous forest cover would be maintained by application of a Selection harvest method, designed to remove the individual or groups of trees necessary to maintain the desired character of the stand through perpetuity. Under a balanced diameter class distribution, the desired stand attributes would include: A stand of 4 to 5 age classes assembled in even-aged aggregations, varying in size from 1/4 to 2 acres. Tolerant species such as Spruce, Grand fir, Cedar and the somewhat-tolerant Douglas-fir would represent the majority of the stocking. Because of the distribution of different age class, an irregular canopy of differing heights will be characteristic. Trees/acre will vary according to diameter class and shall differ by a factor of 1.3 when comparing one diameter class to the next larger class. Maximum tree size would be 20 to 28" @DBH (dependent upon site productivity), exclusive of trees reserved for cavity nesting habitat purposes. The stand would contain a reserve growing stock between 150-200 sq. ft. BA/AC. Optimum cutting cycle will be 10-20 years, which will maintain the stand structure while producing an even flow of timber products. Vigor indices and stand growth would be less than a comparable even-aged stand. An increase in the level of infestation of spruce budworm and root rot could be expected. These stand attributes are reflective of managing for continuous forest cover to meet visual quality objectives, while at the same time capturing the appropriate amount of timber production.

The visual quality objectives for this MA are retention or partial retention; management activities must not be readily noticeable. There will be changes in the natural appearing environment caused by management activities. Timber harvesting and habitat management will introduce visual variety. The changes to the visual environment will be planned and appropriate to maintain or enhance long-term values, while blending with the existing character of the area.

While significant portions of this MA are in the Roaded Natural and Roaded Modified classification; the topography and visual sensitivity of the area will result in maintaining a Semi-Primitive Non-Motorized classification across much of the MA. Recreational use of the area will be limited by access; few new roads will be constructed. Viewing the area from adjacent sites will be the primary recreational use of the area.

Elk winter and summer ranges are found within this MA. The opportunities for enhancement of game habitat will be dependent upon meeting the visual management intent for the area. Much of the area will provide some habitat for cavity and old growth dependent species due to the uneven-aged management prescriptions implemented.

Maintaining the productivity of the site requires that soil displacement and erosion is limited in all activities. Insuring that site productivity is protected will limit offsite effects to the adjacent riparian areas.

Management Area 20

Provide both existing and replacement old growth habitat for dependent species. Timber harvest may be scheduled, but not during this decade.

Target Conditions

Although there is no treatment scheduled in existing stands of old growth until decade 10; and no harvesting is scheduled in the replacement old growth stands until decade 16, stands in this MA will be harvested. The existing old growth stands will be rotated back into replacement old growth conditions and the existing replacement old growth stands will be managed to effectively function as old growth at that time. These stands will be managed to insure adequate distribution of existing and replacement old growth at all times; a minimum of 5 per cent in each category by prescription watershed, or other identified area.

This MA will provide critical habitat for wildlife species dependent upon old growth conditions for their survival. Trees of large diameter, significant dead and dying components, snags, large down woody material, and other factors contributing to useful old growth dependent habitat will be maintained. Characteristics of these stands are:

1. Minimum of 100 square feet of basal area per acre.
2. Minimum age of the oldest trees in the stand is 150 years.
3. Some decadence attributable to stem rot.

The old growth stands will be at least 50 acres in size and not narrower than 300 feet in width. Areas of at least 300 acres are distributed across the Forest to provide quality old growth habitat. Connecting corridors between the old growth stands will be provided by riparian areas, MA 10. Old growth stands will be spatially distributed to insure adequate representation by community type.

This MA will provide pockets of nearly Primitive recreational opportunities. The old growth characteristics of the stands will contribute to a feeling of solitude and remoteness. Because of the sensitive nature of old growth, developed and dispersed recreation will be planned to minimize the effects on the dependent resource values. Development will generally be discouraged in or adjacent to the MA; as needed, it will be designed into locations that can accommodate these uses without undue impacts on the old growth ecosystem.

Appendix B

Best Management Practices – Implementation and Effectiveness

APPENDIX B

BEST MANAGEMENT PRACTICES- IMPLEMENTATION AND EFFECTIVENESS

Each Soil and Water Conservation Practice (BMP) (mitigation measure) is described as follows:

Title: Includes the sequential number of the Practice and a brief title.

Objective: Describes the objective(s) in applying the Practice and the desired results.

Implementation: Identifies specific water quality protection measures to be implemented.

Effectiveness: Provides an assessment of expected effectiveness of applied Soil and Water Conservation Practices (BMPs) (mitigation measures). The assessment is based on literature, site-specific conditions, and professional judgment.

PRACTICE 11.05 - Wetlands Analysis and Evaluation
PRACTICE 13.03 - Tractor Operation Excluded from Wetlands, Bogs, & Wet Meadows
PRACTICE 14.16 - Meadow Protection During Timber Harvesting

OBJECTIVE: To avoid or minimize adverse impacts on wetlands.

IMPLEMENTATION: Soil and vegetation along lakes, bogs, swamps, wet meadows, springs, seeps, or other sources where the presence of water is indicated will be protected from disturbance which would cause adverse effects on water quality, quantity, and wildlife and aquatic habitat (IFPA Rule 3 (h)(iii) and Timber Sale Contract Clauses B6.422, B6.5, B6.6, B6.61, C6.50, and C6.6)

EFFECTIVENESS: Much of this mitigation consists of avoiding the impact [40 CFR 1508.20(a)]. The Forest Service has near-complete control over construction operations. Effectiveness is expected to be high.

PRACTICE 11.07 - Oil and Hazardous Substance Spill Contingency Planning
PRACTICE 11.11 - Petroleum Storage and Delivery Facilities and Management
PRACTICE 15.11 - Servicing and Refueling of Equipment

OBJECTIVE: To prevent or minimize contamination of waters from accidental spills and leakage of fuels, lubricants, bitumens, raw sewage, wash water, and other harmful materials.

If the total oil or oil products storage exceeds 1320 gallons or if any single container exceeds a capacity of 660 gallons, the purchaser must prepare a Spill Prevention Control and Countermeasures (SPCC) Plan (40 CFR 112). The plan must meet EPA requirements including certification by a registered professional engineer.

IMPLEMENTATION:

a. Petroleum product storage containers with capacities of more than 200 gallons, stationary or mobile, will be located no closer than 100 feet from stream, water course, or area of open water. Dikes, berms, or embankments will be constructed to contain the volume of petroleum products stored within the tanks. Diked areas will be sufficiently impervious and of adequate capacity to contain spilled petroleum products [IFPA Rule 2(j) and Timber Sale Contract Clause C6.341].

b. Transferring petroleum products: During fueling operations or petroleum product transfer to other containers, there shall be a person attending such operations at all times [IFPA Rule 2(j)(i) and Timber Sale Contract Clause C6.341].

b. Equipment used for transportation or storage of petroleum products shall be maintained in a leakproof condition. If the Forest Practice Advisor determines there is evidence of petroleum product leakage or spillage he/she shall have the authority to suspend the further use of such equipment until the deficiency has been corrected [IFPA Rule 2(j)(ii) and Timber Sale Contract Clause C6.341].

EFFECTIVENESS: Although SPCC Plans cannot eliminate the risk of materials being spilled and escaping into waters, they can if followed be effective at reducing adverse effects to tolerable levels. Depending on the location and quantity of a spill, a properly implemented Plan can provide for up to 100 percent containment of a spill.

PRACTICE 11.09 - Management by Closure or Restrictions on Use
PRACTICE 15.23 - Traffic Control During Wet Periods

OBJECTIVE: To exclude activities that could result in damages to facilities or degradation of soil and water resources. **Closures and restrictions are usually imposed to achieve several objectives. Practice 11.09 addresses only soil and water objectives and does not address wildlife and other objectives.**

IMPLEMENTATION:

All local roads in the Swiftwater area that would be reconstructed or constructed under any action alternative would be restricted to administrative and timber sale related traffic year around. During initial periods of activity in the proposal area access would be controlled with gates; after proposed sale activity has been completed concrete barriers would replace the gates as the control devices.

EFFECTIVENESS: Effectiveness is highest on those soil types that have high bearing strength or are well-drained and are therefore resistant to damage. Effectiveness is lowest on those soil types which are most sensitive to erosion.

PRACTICE 13.02 - Slope Limitations for Tractor Operation
PRACTICE 14.07 - Determining Tractor Loggable Ground

OBJECTIVE: To reduce gully & sheet erosion and associated sediment production by restricting tractor operation to slopes and sites where corrective measures for proper drainage are easily installed and effective.

IMPLEMENTATION: Tracked or wheel skidding shall not be conducted on geologically unstable, saturated, or easily compacted soils or on slopes exceeding 35 percent. Constructed skid trails on geologically unstable, saturated, or highly erodible or easily compacted soils on slopes over 30 percent will be prohibited [IFPA Rules 3 (c)(i) and (ii) and Timber Sale Contract Clauses B6.42 and C6.6].

EFFECTIVENESS: In general, the less the slope percentage, the less are the chances of rilling, gullying, and soil displacement as a consequence of tracked or wheeled skidding.

PRACTICE 13.04 - Revegetation of Surface-Disturbed Areas
PRACTICE 14.14 - Revegetation of Areas Disturbed by Harvest Activities

OBJECTIVE: To protect soil productivity and water quality by minimizing soil erosion.

IMPLEMENTATION: All temporary roads, landings, and skid trails will be seeded within one year after harvest is completed [IFPA Rule 3(e)(ii) and Timber Sale Contract Clause C6.601].

a. Any temporary roads that may be necessary to harvest any of the proposed units in the Swiftwater area are to be obliterated after the purchasers work has been completed. Contract clause **C6.603 - Temporary Road Obliteration** will be included to insure that this work is accomplished under the timber sale contract.

EFFECTIVENESS: Revegetation can be moderately effective at reducing surface erosion after one growing season following disturbance and highly effective in later years. Effectiveness has been shown to vary from 10 percent on 3/4:1 slopes to 36 percent on 1:1 slopes to 97 percent on 1:1 slopes in later years (King, John G. and E. Burroughs. Reduction of Soil Erosion on Forest Roads. Intermountain Research Station General Technical Report, 1988).

PRACTICE 13.05 - Soil Protection During and After Slash Windrowing

OBJECTIVE: To reduce erosion and sedimentation from road surfaces and fill slopes.

IMPLEMENTATION: Slash and debris may be windrowed along the toe of the fill [IFPA Rule 4(c)(iv) and General Road Specifications-Special Project Specification 201.5].

EFFECTIVENESS: Slash filter windrowing at the base of fill slopes and below culverts where fish passage is not required has been shown to reduce sediment leaving fill slopes by 75 to 85 percent (Cook, Michael J. and John G. King. Construction Cost and Erosion Control Effectiveness of Filter Windrows on Fill Slopes. Research Paper INT-335, Intermountain Research Station, 1983; Burroughs, et.al. Relative Effectiveness of Fillslope Treatments in Reducing Surface Erosion, Horse Creek Road, Nez Perce National Forest. Intermountain Research Station, 1985.

PRACTICE 13.06 - Soil Moisture Limitations for Tractor Operation
PRACTICE 14.04 - Limiting the Operating Period of Timber Sale Activities;
PRACTICE 14.12 - Erosion Prevention and Control Measures During Timber Sale Operations
PRACTICE 15.04 - Timing of Construction Activities

OBJECTIVE: To minimize soil erosion, sedimentation and soil productivity loss by ensuring that activities, including erosion control work, road maintenance, etc., are done when ground conditions are such that erosion and sedimentation can be controlled.

IMPLEMENTATION: Earthwork shall be postponed during wet periods if, as a result, erodible material would enter streams [IFPA Rule 4(c)(ix) and Timber Sale Contract Clause B6.31]

EFFECTIVENESS: Responsible implementation and enforcement are required for high effectiveness.

PRACTICE 14.05 - Protection of Unstable Areas
PRACTICE 15.05 - Slope Stabilization and Prevention of Mass Failures

OBJECTIVE: To identify and protect unstable areas and to avoid triggering mass soil movements.

IMPLEMENTATION: To prevent landslides, fill material used in landing construction shall be free of loose stumps and excessive accumulations of slash. On slopes where sidecasting is necessary, landings shall be stabilized by use of seeding, compaction, riprapping, benching, mulching, or other suitable means [IFPA Rule 3(d)(iii) and Timber Sale Contract Clauses B6.6 and C6.601].

EFFECTIVENESS: Avoidance is the most effective measure on high-risk landforms. Risk assessment based on experience is essential.

PRACTICE 14.06 - Riparian Area Designation
PRACTICE 14.20 - Slash Treatment in Sensitive Areas
PRACTICE 15.12 - Control of Construction in Riparian Areas

OBJECTIVE: To avoid or minimize adverse impacts on riparian areas.

IMPLEMENTATION:

a. Soil and vegetation along lakes, bogs, swamps, wet meadows, springs, seeps, or other sources where the presence of water is indicated will be protected from disturbance which would cause adverse effects on water quality, quantity, and wildlife and aquatic habitat [IFPA Rule 3 (h)(iii) and Timber Sale Contract Clauses B6.422, B6.5, B6.6, B6.61, C6.50, and C6.6].

b. Tracked or wheeled skidding in or through streams shall not be permitted. When streams must be crossed, adequate structures to carry stream flow shall be installed. Cross the stream at right angles to its channel if at all possible. Remove all temporary crossings immediately after use and, where applicable, water bar the ends of skid trails [IFPA Rule 3(g)(i) and Timber Sale Contract Clause C6.5]

c. When cable yarding is necessary across or inside riparian areas it shall be done in such a manner as to minimize stream bank vegetation and channel disturbance [IFPA Rule 3(g)(ii) and Timber Sale Contract Clause C6.4].

d. Provide the large organic debris, shading, soil stabilization, wildlife cover, and water filtering effects of vegetation along Class I streams [IFPR Rules 3(g)(i-iii). These measures are implemented during sale layout].

    1) Leave hardwood trees, shrubs, grasses, and rocks wherever they afford shade over a stream or maintain the integrity of the soil near a stream.

    2) Leave 75 percent of the current shade over the stream.

    3) Carefully log the mature timber from the riparian area in such a way that shading and filtering effects are not destroyed.

    4) Standing trees, including conifers, hardwoods, and snags will be left within 50 feet of the ordinary high water mark on each side of all Class I streams in the minimum numbers set out in the Rules at 3(g)(iii)(d-h).

e. Provide soil stabilization and water filtering effects along Class II streams by leaving undisturbed soils in widths sufficient to prevent washing of sediment into Class I streams. In no case shall this width be less than 5 feet slope distance above the ordinary high

water mark on each side of the stream [IFPA Rule 3(g)(iv) and Timber Sale Contract Clauses B6.422 and C6.6].

f. Waste resulting from logging operations, such as crankcase oil, filters, grease and oil containers, shall not be places inside riparian areas [IFPA Rule 3(f)(iv) and Timber Sale Contract Clause B6.34].

g. Stream crossings shall be the minimum necessary and shall comply with State of Idaho Rules and Regulations and Minimum Standards for Stream Channel Alterations. All culvert installations on Class I streams will allow for fish passage [IFPA Rule 4(b)(vi). This requirement is met during road location and design].

h. Stream crossings and roads that constrict stream channels shall be constructed in compliance with State of Idaho Rules and Regulations and Minimum Standards for Stream Channel Alterations. Roads shall not be constructed in stream channels [IFPA Rule 4(c)(v). This requirement is met during road location and design].

EFFECTIVENESS: Much of this mitigation consists of avoiding the impact, minimizing the impact, or rectifying the impact [40 CFR 1508.20 (a-c)]. The Forest Service has near-complete control over construction operations. Effectiveness is expected to be high.

PRACTICE 14.08 - Tractor Skidding Design;
PRACTICE 14.10 - Log Landing Location and Design
PRACTICE 14.11 - Log Landing Erosion Prevention and Control
PRACTICE 14.15 - Erosion Control on Skid Trails

OBJECTIVE: To insure that timber harvest unit design will maintain water quality and soil productivity by locating/designing landings and skidding patterns to best fit the terrain and avoid soil erosion, and to reduce the impacts of erosion and subsequent sedimentation from log landings.

IMPLEMENTATION:

a. Skid trails shall be kept to the minimum feasible width and number [IFPA Rules 3(c)(i),(ii), and (iii) and Timber Sale Contract Clauses B6.422 and C6.4]

b. All new or reconstructed landings, skid trails, and fire trails shall be located on stable areas outside riparian areas. Sidecasting will be held to a minimum [IFPA Rule 3(d)(i) and Timber Sale Contract Clause B6.422].

c. Landing sizes will be the minimum necessary for safe, economical operation [IFPA Rule 3(d)(ii) and Timber Sale Contract Clause B6.422].

d. Skid trails and fire trails shall be stabilized whenever they are subject to erosion, by waterbarring, cross draining, outsloping, scarifying, seeding, or other suitable means. This work shall be kept current to prevent erosion prior to fall and spring runoff [IFPA Rule 3(e)(i) and Timber Sale Contract Clause B.6]

e. Landings shall be reshaped as needed to facilitate drainage prior to fall and spring runoff. Landings shall be stabilized by establishing ground cover or by some other means within one year after harvesting is completed [IFPA Rule 3(e)(ii) and Timber Sale Contract Clause C6.601]

f. Deposit waste material from construction or maintenance of landings and skid and fire trails in geologically stable locations outside of the appropriate Stream Protection Zone [IFPA Rule 3(f)(iii) and Timber Sale Contract Clause B6.422].

EFFECTIVENESS: Restricting tractor skidding to designated skid trails can reduce the areal extent of soil disturbance from the typical 18-36 percent to 10 percent or less. Properly located landings and skid trails produce similar results.

PRACTICE 14.09 - Suspended Log Yarding In Timber Harvesting

OBJECTIVE: To protect the soil from excessive disturbance and accelerated erosion and to maintain the integrity of riparian areas and other sensitive areas.

IMPLEMENTATION: Uphill cable yarding is preferred. Where downhill yarding is used, reasonable care shall be taken to lift the leading end of the log to minimize downhill movement of slash and soils [IFPA Rule 3(c)(iv) and Timber Sale Contract Clause C6.4].

EFFECTIVENESS: The more suspended log yarding can be used, the less soil disturbance will result.

PRACTICE 14.17 - Stream Channel Protection (Implementation and Enforcement).
PRACTICE 15.13 - Controlling In-Channel Excavation
PRACTICE 15.14 - Diversion of Flows Around Construction Sites
PRACTICE 15.15 - Streamcrossings on Temporary Roads
PRACTICE 15.16 - Bridge and Culvert Installation
PRACTICE 15.19 - Streambank Protection

OBJECTIVES: To protect the natural flow of streams, to maintain unobstructed passage of stormflows, to reduce sediment and other pollutants from entering streams, and to restore the natural course of any stream as soon as practical if the stream is diverted as a result of timber management activities.

IMPLEMENTATION:

a. Whenever possible trees shall be felled, bucked, and limbed in such a manner that the tree or any part thereof will fall away from any Class I streams. Slash that enters Class I streams as a result of harvesting operations shall be continuously removed, as will other debris that enters Class I streams whenever there is a potential for stream blockage or if the stream has the ability for transporting such debris. Material removed shall be placed five feet slope distance above the ordinary high water mark [IFPA Rule 3(f)(i) and Timber Sale Contract Clause B6.5].

b. Slash and other debris that enters Class II streams whenever there is a potential for stream blockage or if the stream has the ability for transporting the debris shall be removed immediately following skidding and placed above the ordinary high water mark [IFPA Rule 3(f)(ii) and Timber Sale Contract Clause B6.5].

c. Waste material from construction of maintenance of landings, skid trails, and fire trails shall be deposited in geologically stable locations outside the appropriate Stream Protection Zone [IFPA Rule 3(f)(iii) and Timber Sale Contract Clause B6.422].

d. Waste resulting from logging operations, such as crankcase oil, filters, grease and fuel containers, shall not be placed inside Class I or Class II Stream Protection Zones (IFPA Rule 3(f)(iv) and Timber Sale Contract Clause B6.34].

e. No construction equipment shall be operated below the existing water surface except that fording the stream at one location only will be permitted, and work below the water level that is necessary for culvert bedding or footing installations will be permitted to the extent that it does not create unnecessary turbidity or stream channel disturbance [ISCPA Rule 9,1 (a) and Standard Road Specifications-Special Project Specification 204.04].

f. Any temporary crossings, bridge supports, and other structures used during the construction period shall be designed to handle anticipated high flows. All such temporary structures shall be completely removed from the stream channel at the conclusion of construction and the area restored to a natural appearance (ISCPA Rule 9,1(b) and Standard Road Specifications-Special Project Specification 204.04].

g. Care shall be taken to cause only the minimum necessary disturbance to the natural appearance of the area. Streambank vegetation shall be protected except where its removal is absolutely necessary for completion of the work [ISCPA Rule 9,1(c) and Timber Sale Contract Clauses B6.3 and C6.50].

h. All fill material shall be placed and compacted in horizontal lifts. Areas to be filled shall be cleared of all vegetation, debris, and other materials that would be objectionable in the fill [ISCPA Rule 9,1(d) and Standard Road Specifications-Special Project Specification 203.15].

EFFECTIVENESS: Properly administered, these measures should be highly effective.

PRACTICE 15.02 - General Guidelines for the Location and Design of Roads and Trails

OBJECTIVE: To locate and design roads and trails with minimal soil and water resource impact while considering all design criteria.

IMPLEMENTATION:

a. Road construction shall be minimized within stream protection zones. Areas of vegetation shall be left or re-established between roads and streams [IFPA Rule 4(b)(i) and Standard Road Specifications-Special Project Specification 204.01].

b. Roads shall be planned no wider than necessary to safely accommodate the anticipated use. Cut and fill volumes shall be minimized by designing the road to fit natural terrain features as closely as possible. As much of the excavated material as possible shall be used in fill sections. Minimum cuts and fills shall be planned, particularly near stream channels [IFPA Rule 4(b)(ii)]

c. Embankments and waste shall be designed so that excavated material may be disposed of on geologically stable sites [IFPA Rule 4(b)(iii)].

d. Roads shall be planned to drain naturally by out-sloping or in-sloping with cross drainage and by grade changes where possible. Dips, water bars and/or cross drainage will be planned when necessary [IFPA Rule 4(b)(iv)].

e. Relief culverts and roadside ditches shall be planned whenever reliance upon natural drainage would not protect the running surface, excavation, or embankment. Culvert installations shall be designed to prevent erosion of the fill. Drainage structures shall be planned to achieve minimum direct discharge of sediment into streams [IFPA Rule 4(b)(v)].

f. Roads shall be constructed in compliance with planning guidelines [IFPA Rule 4(c)(i)].

EFFECTIVENESS: Transportation Planning is an effective means of reducing road mileages which in turn reduces or avoids adverse impacts. Transportation Planning also insures that soil and water considerations are taken into account during the NEPA analysis.

PRACTICE 15.03 - Road and Trail Erosion Control Plan
PRACTICE 15.06 - Mitigation of Surface Erosion and Stabilization of Slopes
PRACTICE 15.07 - Control of Permanent Road Drainage
PRACTICE 15.10 - Control of Road Excavation and Sidecast Material
PRACTICE 15.18 - Disposal of Right-of-Way and Roadless Debris
PRACTICE 15.22 - Road Surface Treatment to Prevent Loss of Materials

OBJECTIVE: To prevent, limit, and mitigate erosion, sedimentation, and resulting water quality degradation prior to the initiation of construction and to minimize erosion from road cutslopes, fillslopes, and travelways during and after construction.

IMPLEMENTATION:

a. Drainage ways shall be cleared of all debris generated during construction and/or maintenance which potentially interferes with drainage or water quality [IFPA Rule 4(c)(ii), Timber Sale Contract Clause C5.4, and Standard Road Specifications-Special Project Specification 204.04].

b. Areas where exposed material is potentially erodible, and where sediment would enter streams, shall be stabilized prior to fall or spring runoff by seeding, compacting, riprapping, benching, mulching, or other suitable means [IFPA Rule 4(c)(iii), Timber Sale Contract Clauses C6.6, C6.601, C6.602, and Standard Road Specifications-Special Project Specification 204.01].

c. In the construction of road fills near streams, material shall be compacted to reduce entry of water, minimize erosion and settling of fill material. Amounts of snow, ice, or frozen soil buried in embankments shall be minimized. No significant amount of woody material shall be incorporated into fills [IFPA Rule 4(c)(iv) and Standard Road Specifications-Special Project Specifications 203.15, 203.06, and 203.09].

d. During and following operations on out-sloped roads, out-slope drainage shall be retained and berms shall be removed on the outside edge except those intentionally constructed for protection of road grade fills [IFPA Rule 4(c)(vi) and Timber Sale Contract Clause C5.4].

e. Drainage shall be provided for quarries to prevent sediment from entering streams [IFPA Rule 4(c)(vii) and Standard Road Specifications-Special Project Specification 611].

f. Cross drains and relief culverts shall be constructed to minimize erosion of embankments. The time between road construction and installation of erosion control devices shall be minimized. Drainage structures or cross drains shall be installed on uncompleted

roads which are subject to erosion prior to fall or spring runoff. Relief culverts shall be installed with a minimum grade of 1 percent [IFPA Rule 4(c)(viii) and Standard Road Specifications-Special Project Specification 204.1].

g. In rippable materials, roads shall be constructed with no overhanging banks and any trees that present a potential hazard to traffic shall be felled concurrently with the construction operation [IFPA Rule 4(c)(x) and General Road Specifications-Special Project Specifications 201 and 203.10].

h. Slumps, slides, and other erosion features causing stream sedimentation shall be stabilized [IFPA Rule 4(d)(ii)].

EFFECTIVENESS:

a. **Route location** ground-truths the results of transportation planning and provides site-specific information on possible problem areas (Gray and Megahan, 1981; Cline et. al., 1981; Megahan and Kidd, 1972; King and Gonsior, 1980).

b. **Designed and controlled cut slopes, fill slopes, road width, and road grades** effectively reduce sediment production by fitting the roads to the land (Bethalmy and Kidd, 1966; Burroughs, Watts, King, and Hanson, 1985; King, 1979; Megahan, 1978).

c. **Designed and controlled ditches, cross drain spacing, and culvert discharge** prevent water from running long distances over exposed ground. **Dewatered (dry) culvert installations and special drainage** such as rock filter blankets and rock buttresses have been demonstrated effective on the Nez Perce Forest (King and Gonsior, 1980; Rothwell, 1983; Anderson et. al., 1970).

d. **Stabilization of road surface and ditch lines over 6 percent with competent rock** (rock that does not rapidly disintegrate) is often over 90 percent effective (Burroughs, et.al., 1983a, 1983b, 1984, 1985; King and Burroughs, 1988).

e. **Slash filter windrows** are logging slash placed at the base of fill slopes and below culverts where fish passage is not required. It is an effective treatment; sediment leaving fill slopes is reduced by 75 tp 85 percent (Burroughs, et. al., 1885; Cook and King, 1983; King, 1984).

f. **Seeding and fertilizing cut slopes, fill slopes, and other disturbed areas** reduces erosion from these sources after one growing season. Effectiveness has been rated at 85 percent or better once the vegetation has become established (King and Burroughs, 1988).

Some of these measures would be immediately effective, such as culvert dewatering. Slash filter windrows are effective immediately and during the first few years thereafter; they may later be near capacity and in some cases would have begun to decompose. By that time, though, revegetation would have become more effective.

PRACTICE 15.08 - Pioneer Road Construction
PRACTICE 15.09 - Timely Erosion Control Measures on Incomplete Roads and Streamcrossing Projects

PRACTICE 15.17 - Regulation of Borrow Pits, Gravel Sources, and Quarries

OBJECTIVE: To minimize erosion and sediment production associated with pioneer road construction, rock sources, and disturbed ground on incomplete projects.

IMPLEMENTATION:

Special Project Specifications will include in Table 204.1 the following requirements:

a. Limit to total length of pioneer roads to 2000 lineal feet after September 15.

b. Maintain continuous earth berms (minimum of one foot high) on the shoulders of roads in fill areas, as directed by the engineer, in all areas roughed to grade until the gravel surfacing is placed.

c. Install and maintain continuously waterbars in all areas until drainage features are completed and/or surfacing has been placed. Soil classification and degree to which permanent drainage features are completed will help to determine the placement of the waterbars.

d. Immediately upon discovery of active erosion straw bales and straw mulch will be placed to contain and control the erosion.

EFFECTIVENESS: These measures should effectively minimize erosion during road construction activities.

PRACTICE 14.18 - Erosion Control Structure Maintenance
PRACTICE 15.21 - Maintenance of Roads
PRACTICE 15.25 - Obliteration of Temporary Roads

OBJECTIVE: To maintain roads in a manner which provides for soil and water resource protection by minimizing rutting, failures, sidecasting, and blockage of drainage facilities.

IMPLEMENTATION:

a. Sidecast all debris or slide material associated with road maintenance in a manner to prevent their entry into streams [IFPA Rule 4(d)(i), Timber Sale Contract Clause C5.4, and Standard Road Specification-Special Project Specification T108].

b. Repair and stabilize slumps, slides, and other erosion features causing stream sedimentation [IFPA Rule 4(d)(ii), Timber Sale Contract Clauses C5.4 and C5.253, and Special Project Specification T108].

c. Active Roads. An active road is a forest road being used for hauling forest products, rock and other road-building materials. The following maintenance shall be conducted on such roads:

   1) Culverts and ditches shall be kept functional.

   2) During and upon completion of seasonal operations, the road surface shall be crowned, out-sloped, in-sloped or water barred, and berms removed from the outside edge except those intentionally constructed for protection of fills.

3) The road surface shall be maintained as necessary to minimize erosion of the subgrade and to provide proper drainage.

4) If road oil or other surface stabilizing materials are used, apply them in such a manner as to prevent their entry into streams [IFPA Rule 4(d)(iii)] and Timber Sale Contract Clauses C5.441 and C6.341].

d. Inactive roads. An inactive road is a forest road no longer used for commercial hauling but maintained for access (e.g., for fire control, forest management activities, recreational use, and occasional or incidental use for minor forest products harvesting). The following maintenance shall be conducted on inactive roads:

1) Following termination of active use, ditches and culverts shall be cleared and the road surface shall be crowned, out-sloped or in-sloped, water barred or otherwise left in a condition to minimize erosion. Drainage structures will be maintained thereafter as needed.

2) The roads may be permanently or seasonally blocked to vehicular traffic [IFPA Rule 4(d)(iv)].

e. Abandoned Roads. An abandoned road is not intended to be used again. No subsequent maintenance of an abandoned road is required after the following procedures are completed:

1) The road is left in a condition suitable to control erosion by out-sloping, water barring, seeding, or other suitable methods.

2) Ditches are cleaned.

3) The road is blocked to vehicular traffic [IFPA Rule 4(d)(v) and Timber Sale Contract Clause B6.62].

EFFECTIVENESS: These measures should effectively minimize erosion from roads.

Appendix C

Draft Threatened and Endangered Wildlife Biological Assessment

United States Department of Agriculture | Forest Service | Nez Perce National Forest | Selway RD Kooskia, ID 83539

Reply to: 1950 Date: February 08, 1993

Subject: Upper Swiftwater EIS - T&E Wildlife Biological Assessment (DRAFT)

To: District Ranger

I INTRODUCTION

This Biological Assessment is presented in compliance 36 CFR 219.19 of the NFMA regulations and Chapter 2670 of the Forest Service Manual. Forest Service policy (FSM 2670) for threatened and endangered species is to manage habitats to assure special protection measures provided under the Endangered Species Act of 1973 become unnecessary.

The USF&WS species list of 8/25/92, identified only Gray wolf and goshawk. However, per direction from Northern Region T&E Program Manager (Bill Ruediger) on 10/06/92, "candidate (species) need not be addressed in BE's unless they are (classified a) sensitive (species)." Therefore, the effects of this planned action on goshawk will not be addressed in this Biological Assessment (BA). It is, however, addressed in the Sensitive Wildlife Species BA.

Neither the grizzly bear or the bald eagle was not identified on the species list. However, because the Bitterroot Grizzly Bear Recovery Area is in close proximity and because bald eagles occur on the margin of the study area in the winter, we have included these species in this Biological Assessment. This Biological Assessment addresses Gray wolf, grizzly bear and bald eagle (Table 1).

TABLE 1. T&E SPECIES POSSIBLY AFFECTED BY THE PLANNED ACTION

Status	Common Name	Scientific Name	Identifying Agency
Endangered	Gray Wolf	**Canis lupus**	USF&WS
Threatened	Grizzly Bear	**Ursus arctos horribilbus**	USFS/USF&WS
Threatened	Bald Eagle	**Haliaeetus leucocephalus**	USFS

II PROJECT DESCRIPTION

The Upper Swiftwater study area (approximately 4,000 acres) lies about three air miles south of Lowell, Idaho, and includes the Swiftwater and Burned Creek drainages. Key resource values within the assessment area include timber; elk summer and winter habitat; anadromous and resident fisheries; visual quality; big game hunting; and road and trail-oriented recreation. (A complete description of area resource values is included in Chapter Three of the Swiftwater EIS).

Perferred Action:

Construct and reconstruct a total of approximatly 3.27 miles of forest road to harvest approximately 351 acres to remove approximately 10.4 MMBF of timber. The harvest areas would be treated to reduce accumulated slash and reforested with commercial conifer species. Locations of preferred action are shown on the alternative map included in the EIS. Detailed maps are available in the project file. The schedule for project implementation is described in detail in Chapter Two of the EIS.

Timber harvest will approximately double the acreage of openings (from a current amount of approximately 390 acres to about 740 acres). The perferred action will retain approximately 71% of the 4000 acre study area in coniferous stands older than 60 years (24% of study area in 60-80 year; 34% in 80-100 year; and 13% in 100+ year old classification). The project will provide for creation and distribution of additional forage areas in areas currently receiving low to negligible summer and fall elk use.

Mitigating Actions:

* Timber harvest and road construction/reconstruction activities would be prohibited on road systems 1119A and 9723 between October 1 and December 15. This practice will provide for full retention of security area (i.e., no reduction in the elk habitat potential associated with a loss of security area) during hunting season.

* Timber harvest and road construction/reconstruction activities would be prohibited on road systems 1119A and 9723 between May 15 - June 15 and October 1 - December 15. This will limit the impacts of logging on elk calving, elk security and hunters.

* Following timber harvest, to assure compliance with Forest Plan standards for elk summer habitat effectiveness, all interior roads in the Swiftwater Timber Sale would be closed yearlong to motorized vehicles (Rd 470 would remain, as it is currently, open yearlong to all vehicles). Because interior road systems 1119A and 9723 provide access to winter range, this closure should extend to all motorized vehicles (i.e., snowmobiles, ORV's and highway vehicles). Snowmobile use on Rd 1119 (in the Goddard Creek watershed) would be permissible beyond 12/01.

* At least 20% of each elk summer habitat analysis unit qualifies as security area (irrespective of the hunting season security area that occurs at winter range elevations) during and after active roading and logging. Elk travel corridors would be retained within the study area sufficient to provide for at least current levels of elk use.

* Elk summer range habitat effectiveness will be approximately 53% in the Lodge Point Elk Habitat Analysis Unit (EHAU) and 74% in the Goddard EHAU. Upon completion of the project, elk summer habitat effectiveness could reach approximately 55% in the Lodge Point EHAU and 77% in the Goddard EHAU.

* To achieve Forest Plan standards for the Goddard EHAU, vehicle access on Rd 1119 (in the Goddard Creek watershed) will be restricted yearlong to all motorized vehicles.

* A minimum of approximately 440 acre (210 acres of old growth and 230 acres of replacement old growth) have been designated within the study area. This fully complies with the Forest Plan standards for 10% of the watershed (study area) to be managed for coniferous old growth forest. These stands are distributed spatially and elevationally and are sufficiently large enough to be managed under current management philosophies as old growth forest.

* Corridors between designated old growth areas (MA20) will be retained by: 1) designating actual old growth stands as part of the corridor; 2) retaining unharvested conifers stands within riparian areas; or 3) retaining unharvested conifer stands across watershed divides. Typically, connecting corridors are a **minimum** of 200' (horizontal distance) wide and are located along 3rd order or larger stream courses.

* Approximately 5 snags and 4 green trees per acre will be retained during timber sale layout. At least 20-25% of trees designated for snags should be greater than 20" dbh; the remainder should be greater than 12" dbh. This complies with the Forest Plan standards for snags.

In addition to the above, other actions being taken on the Selway Ranger District for threatened or endangered wildlife species management routinely include:

* Management of habitat for ungulate prey base through restricted vehicle access, prescribed habitat burning, forage seeding, and timber sale coordination. Vehicle access management is monitored across the developed portion of the Selway District via the elk summer range model.

* Patrols and monitoring of restricted access roads during high public use periods (principally hunting season). Patrols involve closure device inspections, public contacts and law enforcement actions on violations. Approximately 20 person days were applied on the Selway Ranger District in 1992 to monitor access management.

* Managing riparian areas to protect stream channels, water quality and provide for obligate species. Typically, riparian areas along major stream courses provide travel cooridors for many wildlife species.

* Educational presentations to the local school and public contacts;

* TE&S training of District employees (last conducted Fall '92); and,

* Coordination with Idaho Department of Fish and Game and the U.S. Fish and Wildlife Service on TE&S species management.

III EFFECTS ANALYSIS

The objective of this Biological Assessment is to determine if there will be effects on the above threatened or endangered species as a result of the decision to construct roads and harverst timber in the Upper Swiftwater EIS. The following sections provide a summary of these effects for the above mentioned species.

A. Northern Rocky Mountain Gray Wolf

Wolves use a variety of areas capable of providing sufficient space to hunt, hide, reproduce and travel. These areas typically offer only limited exposure to humans. Wolves use forested cover to provide security from human disturbance particularly around denning and rendezvous sites. Wolf requirements for cover are also related indirectly to cover needs of their ungulate prey. Different

wolf social units often use different combinations of key habitat components within their territories (Northern Rocky Mountain Wolf Recovery Plan, 1987).

Wolves have extensive home ranges and territories. Because the pups are less mobile during the spring and summer, a pack may not move as widely as it does during fall and winter (Paradiso, 1982; Tilt, 1987). Kaminski and Hansen (1984) reported home ranges and territories ranged from approximately 240-300 square miles. The quality and combination of the key habitat components also may determine the size of territory a wolf social unit may require. Wolves amy shift their territories from year to year and have been reported to vary use on portions of their territory throughout the year. However, wolves have also been reported to compress their territory during winter. In the Northern Rocky Mountains, they may move to lower elevations to avoid heavy snows and seek prey (Paradiso, 1982).

Dens are usually located on moderately steep slopes with southerly aspects and well-drained soils usually within close proximity to surface water and at an elevation overlooking surrounding low-lying areas (Northern Rocky Mountain Wolf Recovery Plan, 1987). Dens may be used year after year; occassionaly pups are moved between two or more dens (Paradiso, 1982).

Rendezvous sites are resting and gathering areas occupied by wolf packs during summer and early fall after the natal den is abandoned (Northern Rocky Mountain Wolf Recovery Plan, 1987). Rendezvous sites are complexes of meadows that have adjacent hillside timber with nearby surface water. Active rendezvous sites can be characterized by matted vegetation in the meadow, resting beds adjacent to trees in the forest and a system of well used trails through the adjacent forest and across the meadow. Wolves utilize a succession of rendezvous sites until the pups are mature enough to travel. The first rendezvous site occupied after leaving the natal den is usually a traditional site. These serve as rearing and training grounds for the pups.

Wolves are highly sensitive to disturbance at this first rendezvous site and less sensitive at successive rendezvous sites. Both dens and rendezvous sites are often characterized by having nearby forested cover, remote from human disturbance (Northern Rocky Mountain Wolf Recovery Plan, 1987).

Gray wolves are carnivorous and prey primarily on ungulates such as elk (**Cervus canadensis**), white-tailed deer (**Odocoileus virginianus**) and moose (**Alces alces**). Their alternate prey base typically consists of smaller mammals and birds, such as beaver (**Castor canadensis**), small rodents, rabbits and grouse. Wolves in Montana are known to key in on white-tail deer as their primary prey. Primary prey habitat important to gray wolf includes:

* Ungulate summer and fall range.

* Ungulate habitat: Calving and fawning areas are important as wolves are known to selectively prey upon newborn ungulates (Northern Rocky Mountain Wolf Recovery Plan,1987). Winter range is often limiting to ungulate populations. There is a need to maintain the productivity of big game habitats to ensure an adequate year round prey base.

* Riparian habitat: This habitat provides habitat for alternate prey species, primarily beaver, during the summer.

Wolves ranged throughout Idaho until the mid to late 1800's. During this period their numbers were significantly reduced due to conflicts with mining and livestock operations and a reduction in their prey base. Currently, Forest biologists suspect, based on confirmed sightings of gray wolves on forests immediately adjacent to the Nez Perce National Forest, that wolves are present on the Forest. A significant factor supporting the suspicion, is the juxaposition of the Forest relative to

wolves possibly traveling the Bitterroot Range from Canada to central Idaho. The Nez Perce Forest dissects that likely travel cooridor.

1. Current Situation/Activity Evaluation

Based on guidelines from "Northern Rocky Mountain Wolf Recovery Plan (1985), three key components of wolf habitat are:

* Sufficient, year-round prey base of ungulates (big game) and alternate prey;
* Suitable and somewhat secluded denning and rendezvous sites; and,
* Sufficient space with minimal exposure to humans.

The following synopsis describes these habitat components as they pertain to the Upper Swiftwater study area.

a. Sufficient, year-round prey base:

The study area provides suitable year-round elk range. Elk inhabit the gentler slopes adjacent where forage and hiding cover are in close proximity. The authors estimate the local elk population in the study area to be less than 50 animals during the heaviest use period (summer and fall). Approximately 1400 acres of elk winter range occurs in the study area. The area also provides summer and winter habitat for white-tailed deer.

The study area provides a year-round habitat for its prey base. Elk or deer habitats within the study area would not limit wolf recovery. Also, while beaver do not inhabit the study area, they occur in the main Selway River immediately adjacent to the study area. The supply of prey available to wolves should remain static or possibly increase with timber harvest.

b. Suitable, secluded denning and rendezvous sites

A combination of relatively steep terrain, dense forest and cool aspects limit potential sites considered desirable denning sites. The potential sites most suitable for denning (drier aspects, gentler terrain and deep soils) are in close proximity to a major Forest Service Road (Rd 470). The overall suitability of the study area for wolf denning and rendezvous is considered marginal (at best).

c. Sufficient space; minimal human exposure

The study area is approximately 2.5km by 7 km. The entire Forest Service portion of the study area is within the commercial forest timber base. USF&WS policy is that wolf management will not differ between areas inside and outside the Central Idaho Wolf Recovery Area until wolf numbers increase to the recovery goal of 10 breeding pairs USF&WS, 8/19/92).

Sight distances are limited in the study area by dense coniferous vegetation on 80+%. However, the study area is considered relatively accessible by vehicles and hiking. Also, black bear hunting and the general big game season directly provide opportunities for illegal wolf mortality.

The study area is not the spatial unit to consider for wolf recovery needs. Also, it is removed from relatively isolated roadless areas and the Selway-Bitterroot Wilderness Area where sufficient living space for a wolf is expected.

Use of Upper Swiftwater study area by humans is frequent, and common, particularly during hunting season. During the general big game hunting season, human disturbance along the Swiftwater Creek watershed divide should be considered moderate to high. The preferred action will cause a minor increase in road access into the interior Upper Swiftwater study area.

The level of human activity is not expected to markedly change in the study area from recent historic levels. The risk of potential illegal wolf mortality is not expected to be directly altered by the preferred action.

2. Conservation and Recovery Efforts

Past and current measures utilized by the Nez Perce National Forest for the conservation and recovery of the Northern Rocky Mountain gray wolf on the Forest include:

* Wolf summer habitat survey, Selway and Moose Creek Ranger Districts, 1989.
* Wolf howling survey conducted in 1988.
* Wolf camera surveys conducted in 1988 and 1989.
* Demonstrated consultation with USFWS to remove a wolf hybrid (Selway Ranger District, 1991).
* Restricting vehicle access and human disturbance sufficient to comply with the elk summer range habitat objectives specified in the Forest Plan.

Mitigating actions specific to the planned road construction and timber harvest in the Upper Swiftwater study area include:

* If an active wolf den or rendezvous site is encountered, consultation will be initiated immediately. Sightings of wolves, their tracks, howling, or other evidence of their occurrence will be forwarded to the U.S. Fish and Wildlife Service in a timely manner.

3. Evaluation Summary and Conclusion

A **Level A Survey** for wolf habitat characteristics was done in the Upper Swiftwater study area. For a Level A Survey, no field survey is done. An interpretation of habitat viability and potential for species presence is done using aerial photograph interpretation and a review of existing site records. This survey level is used to estimate the probability of a listed species inhabiting the study area.

Review of the study area, in combination with the literature, indicated marginal denning and rendevouz potential. To date, fifteen sightings or reports of wolves or large canids have been made on the Selway Ranger District (Table 2). Three of these occurred within five miles of Upper Swiftwater study area boundary. These have been qualified by the U.S. Fish and Wildlife Service as "probable" occurrences. Based on the number of sightings, sign and their ratings, it is possible (but not probable) that wolves occupy the general area in or near the Upper Swiftwater study area.

Despite this evidence, no absolute confirmation of wolves has yet been made on the Forest; no active dens or rendezvous areas are known to exist. Yeo (1989) stated that locations of wolf sightings, which are often associated with easy human access, may mean little about areas preferred by wolves.

TABLE 2. REPORTED WOLF SIGHTINGS - SELWAY RANGER DISTRICT

DATE	EVIDENCE (*)	LOCATION	W/IN 5 MI OF STUDY AREA?
10/82	Animal Observed	Sec 8, T32N R7E	Yes
8/84	Howling	Sec 24, T32N R6E	Yes
7/87	Five Animals Observed	Sec 10, T31N R6E	Yes
11/82	Two Animals Observed w/ kill; Tracks	Sec 31, T31N R7E	No
9/89	Track	Sec 14, T30N R7E	No
9/84	Animal Observed	Sec 21, T30N R9E	No
10/88	Animal Observed	Sec 19, T30N R11E	No
9/79	Animal Observed	Sec 29, T32N R10E	No
5/82	Track	Sec 23, T32N R8E	No
6/82	Track	Sec 23, T32N R8E	No
6/87	Animal Observed	Sec 23, T32N R8E	No
5/91	Animal Observed	Sec 12, T32N R8E	No
10/82	Howling	Sec 4, T32N R8E	No
6/86	Animal Observed	Sec 33, T33N R8E	No
6/87	Animal Observed	Sec 33, T33N R8E	No

* = (Source: Idaho Conservation Data Center)

Based on the current records of wolf sightings on the Selway Ranger District, the likelyhood that wolf currently inhabit the study area is a **Low Probability** (i.e., <40% probability that the species inhabits the study area). The degree of cover loss and disturbance by the preferred action on wolf or wolf habitat is inconsequential to wolves or its ungulate prey base.

The USF&WS interprets that measures to protect wolf and wolf habitat should extend well outside the official Central Idaho Wolf Recovery Area. Therefore, it is often necessary to include mitigating actions to account for the possibility that wolves do inhabitat a given area. The level of activities and mitigations stated in this document will help to ensure that all of the habitat features and characteristics which are essential for wolf recovery will remain intact. This is consistent with management objectives for wolf recovery on the Nez Perce Forest.

Elk summer habitat objectives are being monitored across the Selway Ranger District. Table 3 (next page) depicts the extent to which the District is in compliance with the elk habitat objectives established in the Forest Plan. Roads and road densities, habitat effects and a subjective determination of Forest Plan compliance is included in the table.

Interpretation of the data presented in Table 3 indicates that approximately 55,400 acres of the 104,200 acres of elk summer range is substantially higher than the Forest Plan objective; 23,600 substantially below objective. Approximately 7200 acres are just above Forest Plan objective; 18,000 acres just below objective. From this information, over 53% of elk summer range in the developed portion of the Selway Ranger District is substantially above the Forest Plan objective for elk summer range; 23% substantially below objective. Miles of standard road (per Elk Summer Range Guidelines) are 0.3 mi/mi², 1.1 mi/mi², 1.0 mi/mi² and 1.2 mi/mi² for Substantially Higher, Just Above, Just Below and Substantially Below Elk Habitat Analysis Units, respectively. In addition, elk summer range north of Selway River and on the east side of Meadow Creek is essentially unroaded and is a minimum of 95% for elk summer habitat effectiveness.

This analysis demonstrated that the probability that wolf occurs in or near the Upper Swiftwater Study area is low. The analysis has also demonstrated that elk summer range, cumulatively, is above Forest Plan objectives for the Selway Ranger District. Therefore, it can be concluded that the level of preferred action within the Upper Swiftwater study area, by itself or in combination with other Forest Service management practices, will not diminish possible wolf population or its habitat. Thus, with the inclusion specified mitigating actions, we can determine with this Biological Assessment that the preferred action is not "**Likely to Adversely Affect**" wolf or the critical features its habitat.

4. Conflict Determination

Northern Rocky Mountain (gray) wolf recovery goals and tasks, developed by the Rocky Mountain Wolf Recovery Team, have been published in the Northern Rocky Mountain Wolf Recovery Plan (U.S. Fish and Wildlife Service, 1987). This plan identifies central Idaho as a recovery area. The U.S. Fish and Wildlife Service agrees with Kaminski and Hansen (1984) that five areas on the Nez Perce National Forest may be key to wolf recovery. The preferred action is not located in any of the five key areas. No key big game migration corridors are recognized to overlap the project area.

Potential conflicts for conflicts between wolf recovery efforts and the preferred action will be resolved to benefit the wolf. Should a potential or real conflict arise, the situation will be dealt with on an incident or site specific basis through consultation with the USF&WS and IDF&G.

TABLE 3. CUMULATIVE RECORD BY ELK SUMMER RANGE HABITAT ANALYSIS UNIT

(Selway Ranger District)

ANALYSIS AREA	AREA (ac)	TOTAL STAND-ARD MILES	MILES OF STAND-ARD RD/MI²	HAB POT (Rds)	HAB POT (Lvstk)	HAB POT (Oth)	HAB EFFECTIVE-NESS (Est)	HABITAT OBJECTIVE	EHAU AT OR ABOVE OBJECTIVE¹
Brown Springs	6910	13.55	1.26	56%	95%	91%	48%	50%	Just Below
Falls Creek	7500	5.73	.49	76%	96%	91%	66%	50%	Substantially Higher
Goddard	6900	6.88	.64	71%	100%	99%	70%	75%	Just Below
Horse Creek	7435	8.27	.71	68%	100%	91%	62%	50%	Substantially Higher
Horse Ridge	8280	.62	.05	97%	100%	100%	97%	75%	Substantially Higher
Iron Mountain	6400	4.75	.47	77%	100%	90%	69%	75%	Substantially Lower
Island Creek	6700	.25	.02	99%	95%	91%	85%	75%	Substantially Higher
Little Boulder Cr	6765	.06	.01	100%	100%	100%	100%	75%	Substantially Higher
Lodge Point	7170	12.07	1.08	58%	99%	94%	54%	50%	Just Above
North Green Ridge	4810	.06	.01	99%	100%	100%	99%	75%	Substantially Higher
North Hamby	6710	18.36	1.75	51%	100%	73%	37%	50%	Substantially Lower
Pine Knob	5425	12.92	1.52	53%	99%	82%	43%	50%	Substantially Lower
Saddle Creek	6700	8.81	.84	64%	95%	91%	55%	75%	Substantially Higher

ANALYSIS AREA	AREA (ac)	TOTAL STAND-ARD MILES	MILES OF STAND-ARD RD/MI²	HAB POT (Rds)	HAB POT (Lvstk)	HAB POT (Oth)	HAB EFFECTIVE-NESS (Est)	HABITAT OBJECTIVE	EHAU AT OR ABOVE OBJECTIVE[1]
Solo Creek	5090	8.84	1.07	59%	76%	90%	40%	50%	Substantially Lower
South Hamby	4150	6.38	.98	60%	100%	80%	48%	50%	Just Below
West Fork Point	7200	2.43	.22	88%	100%	99%	88%	50%	Substantially Higher

[1] "JUST" refers to the estimated habitat potential being 1-5%, above or below the set habitat objective. "SUBSTANTIALLY" refers to the estimated habitat potential being 6% or greater, above or below the set habitat objective.

5. **Consultation with US Fish and Wildlife Service**

8/19/92, Central Idaho Wolf Recovery Area clarification

8/25/92, latest species list (1-4-92-SP-628)

9/16/92 (informal consultation with Ted Koch, Boise):

* State that Upper Swiftwater study area is within Central Idaho Wolf Recovery Area (refer to August 19, 1992 letter);

2/9/93, (informal consultation with Ted Koch, to confirm that T&E species list issued 8/25/92 is current. Ted stated that it was and issued this project the following species list code: 1-4-93-SP-202).

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B. Grizzly Bear

The grizzly bear is listed by the U.S. Fish and Wildlife Service as a threatened species. The Selway-Bitterroot Wilderness Area comprises a large portion of the grizzly bear recovery area known as the Bitterroot Recovery Area. In 1991, a 5 year habitat evaluation concluded that this area can support a viable grizzly bear population based on biological factors (Davis and Butterfield, 1991). At this time, the Nez Perce National Forest is not recognized as having any occupied grizzly bear habitat. Public involvement efforts for recovery planning are now underway.

In the late 1800's, fairly large numbers of grizzlies were observed feeding on salmon along the Clearwater River (Wright 1909). There have been numerous reports concerning grizzly bears on the Nez Perce NF since 1920. However, no reports have supportive evidence such as pictures, track casts, scats or hair. The last confirmed report of a grizzly in this area was the grizzly bear killed near Colt Creek in 1956. According to recent records of the Idaho Natural Heritage Program

(1989) and the Idaho Department of Fish and Game, there have not been any recorded sightings of grizzly bears in or near the Upper Swiftwater study area.

There have been periodic reports of unconfirmed grizzly sightings in the Selway-Bitterroot over the years. Historical records indicate that the grizzly bear population dwindled in the early 1900's when the last multiple sightings were reported. Don McPherson, an Idaho Fish and Game conservation officer, observed a grizzly track near Ditch Creek in 1961, approximately 20-30 air miles southeast of the project area. According to High (1992), the last verified documentation known of grizzly bear in the Selway-Bitterroots was in the mid 1970's when a grizzly was observed in Gash Creek west of Victor, Montana, by Bill Callihan. Callihan had done grizzly bear food habit research and was familiar with bear identification. Chuck Jonkel, grizzly bear expert at University of Montana, identified the hair sample that was collected as grizzly.

Davis and Butterfield (1991), implied that habitat use by grizzly bears coincides with seasonal availability of a food supply. Their denning sites are commonly on northern aspects above 6000 feet, at or above treeline. After emergence, bears travel to lower elevations, usually along ridgetops. They seek out big game carcasses on winter range areas or visit traditional spring ranges where grasses, sedges, horsetails, and forbs such as skunk cabbage, cow parsnip, and umbels are prevalent. Traditional spring ranges for grizzlies are characterized by side hill parks, avalanche chutes, wet meadows, and low gradient stream bottoms. Unlike black bears, they actively search for and dig out rodents. Ants and grubs are also well represented in their diet at this time of year.

As spring progresses into summer, grizzly bears follow the "greening up" of vegetation to higher elevation feeding on grass and forb concentrations. Big game fawning and calving areas provide another rich source of prey for bears during this time of year. Both open and closed forests are used by grizzlies for feeding, traveling, and bedding.

By mid-summer and into fall, berry-producing plants are utilized by grizzlies and include huckleberry, serviceberry, elderberry, rose, chokecherry, red-osier dogwood, raspberry, strawberry, thimbleberry, honesuckle, and kinnikinnick. Areas where fruit is most concentrated such as meadows, avalanche chutes, and huckleberry and mixed shrubfields receive heavy bear use at this time of year. Berry-producing habitat is critical for grizzly bears to reach the body weights required for winter denning. When berries are no longer available, bears shift their diet to tubers, roots, rodents, insects, and fish until they enter their winter dens in November.

Grizzly bears are sensitive to human use and activities and will avoid heavily used areas. The potential for human disturbance is important because it can: 1) directly influence the amount of habitat available to grizzlies; 2) affect the use of specific high quality habitat areas; and 3) increase direct conflicts associated with artificial food supplies and be a factor in mortality risk (bear and human).

1. Current Situation/Activity Evaluation

Seven habitat considerations are essential to a grizzly bear population (Butterfield and Almack, 1985; Davis and Butterfield, 1991). These are:

* Living space;
* Isolation from human disturbance;
* Sanitation (i.e., exposure to artificial foods);
* Adequate food supply;

* Suitable denning sites;
* Vegetative (habitat) diversity;
* Safety (i.e., exposure to human induced mortality).

The following synopsis describes these key habitat components as they pertain to the preferred action.

a. Living Space

The study area is approximately 2.5 m by 7 km. The Upper Swiftwater study area is across the Selway River from, and outside of, the Bitterroot (grizzly bear) Recovery Area (in draft), which is approximately 14,000 km² in size. The BRA has been determined to be of sufficient size to provide the space requirements for grizzly bear (Davis and Butterfield, 1991).

The study area is not the spatial unit to consider for grizzly bear recovery needs. Also, it is removed from relatively isolated roadless areas and the Selway-Bitterroot Wilderness Area to allow for sufficient living space for grizzly bear.

b. Isolation From Human Disturbance

Dispersed camping, other outdoor recreation activities and industrial forestry practices occurs in the Upper Swiftwater study area. The area is reasonably accessible by driving and hiking. Dense coniferous vegetation and steep, rugged terrain dominate 80+% of the study area.

Black bear hunters in May and June have some disturbing effect. The planned action will not signficantly increase human disturbance above historic levels.

c. Sanitation

Little camping occurs on the Upper Swiftwater study area except during the general big game hunting season. The area is included in an existing, permitted big game hunting outfitting area. The outfitter does not use the study area to place base camps. However, numerous private party hunting camps are annually located on the margins of the study area during the general big game season.

The presence of recreationist and industrial forestry crews during snow-free periods of the year, makes the potential of encountering or being habituated to artificial foods by grizzly bear to be moderately probable.

d. Adequate Food Supply

Grasses and forbs are readily available during spring green-up. Huckleberry, serviceberry, elderberry, red-osier dogwood, strawberry, thimbleberry and honeysuckle are all present within the study area. The Upper Swiftwater study area provides year-round range to elk and deer. The supply of ungulate prey available to grizzlies should remain static or possibly increase with the preferred action.

e. Suitable Denning Sites

Potential grizzly bear den locations most typically occur on isolated north slopes above 5800' elevations. Assuming proper soil characteristics or caves, denning habitat occurs throughout the BEA (Butterfield and Almack, 1985).

The Upper Swiftwater study area is generally below 5000' elevation. This coupled, with its relative accessibility to potential human disturbance, make the study area marginal (at best) for grizzly bear denning. The planned action is not expected to affect denning site potential.

f. Vegetative Diversity

Vegetation within the study area is dominated by coniferous forest (approximately 80%) with some openings (approximately 20%) created by recent logging. Some forested stands in the headwaters of Swiftwater Creek are comprised of grand fir mosaic {old growth grand fir interspersed with dense stands of red alder (**Alnus rubra**), western coneflower (**Ratibida columnifera**) and arrowleaf groundsel (**Senecio triangularis**)}. Vegetation other than this is inconsequential.

g. Safety

Sight distances within the study area are limited by dense coniferous vegetation on 80+% of the study area. However, the relatively accessible location of the preferred action to human disturbance limits potential grizzly bear security. Black bear hunting and the general big game season would also directly provide opportunities for illegal grizzly bear mortality.

The risk of potential illegal grizzly bear mortality is not expected to be directly altered by the preferred action. The level of human activity is not expected to markedly increase in the study area above recent historic levels.

2. Conservation and Recovery Efforts

Past and current measures utilized by the Nez Perce National Forest for the conservation and recovery of the grizzly bear on the Nez Perce National Forest specific to this preferred action include:

* If an active grizzly bear den or bear is encountered, consultation will be initiated immediately. Sightings of grizzly bear, their tracks or other evidence of their occurrence will be promptly forwarded to the U.S. Fish and Wildlife Service.

3. Evaluation Summary and Conclusion

A **Level A Survey** for grizzly bear habitat characteristics was done in the Upper Swiftwater study area. Based on the absence of grizzly bear sightings on the Selway Ranger District, the likelyhood that grizzly bear currently inhabit the study area is a **Low Probability.** The project study area is entirely outside of the Bitterroot Grizzly Bear Recovery Area. The degree of cover loss and disturbance by the preferred action on the bear or its habitat is inconsequential to grizzly bears or its ungulate prey base.

The USF&WS interprets that measures to protect grizzly bears or its habitat may extend outside the official grizzly bear recovery area. Therefore, it is often necessary to include mitigating actions to account for the possibility that grizzly bears do inhabitat a given area. The level of planned activity and mitigations stated in this document will help to ensure that all of the habitat features and characteristics which are essential for grizzly bear recovery will remain intact. This is consistent with management objectives for grizzly bear recovery on the Nez Perce Forest.

This analysis has demonstrated that the probability that grizzly bears occurs in or near the Upper Swiftwater Study area is low. The analysis has also demonstrated that the elk summer range is considered above Forest Plan objectives for the Selway Ranger District. Therefore, it can be concluded that the level of preferred action within the Upper Swiftwater study area, by itself or in combination with other Forest Service management practices, will not diminish possible grizzly bear population nor its habitat. Thus, with the inclusion specified mitigating actions, we can determine with this Biological Assessment that the preferred action would have **"No Affect"** on grizzly bear or the critical features its habitat.

4. Conflict Determination

Grizzly bear recovery goals for the BRA have not been developed (as of this analysis). The direct and indirect effects of the preferred action on grizzly bear or potential grizzly bear habitat include slightly increased potential for human disturbance and associated risk of mortality. Cumulative effects to the grizzly bear or its potential habitat would be due to increased or expanded human disturbance on or near the Upper Swiftwater study area. Human disturbance near current levels will keep the potential for this area to support grizzlies moderate to high. Potential grizzly bear habitat in the BRA would not be affected.

Potential conflicts between grizzly bear recovery efforts and preferred action will be resolved to benefit the bear. Should a potential or real conflict arise, the situation will be dealt with on an incident or site specific basis through consultation with the USF&WS and IDF&G.

5. Consultation with US Fish and Wildlife Service

7/14/92 (informal consultation with Ted Koch, Boise):

* Suggested including grizzly bear as potentially occurring in the study area "because of proximity to (Bitterroot) grizzly bear Recovery Area";

8/25/92, latest species list (1-4-92-SP-628)

9/16/92 (informal consultation with Ted Koch, Boise):

2/9/93, (informal consultation with Ted Koch, to confirm that T&E species list issued 8/25/92 is current. Ted stated that it was and issued this project the following species list code: 1-4-93-SP-202).

* (Notes presented in 'Gray Wolf' section of this BA)

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C. Bald Eagle

The bald eagle is a winter resident and has been observed from September through July along the Middle Fork of the Clearwater River, the lower Selway River and surrounding areas on the Nez Perce National Forest. Bald eagle populations are on the increase in North Idaho (USDA, Forest Service, 1989). Selection of wintering habitat is determined by availability of prey and carrion, potential for human disturbance and availability of suitable perching and roosting sites. Bald eagles inhabit areas adjacent and within close proximity to water sources providing an abundance of prey species such as waterfowl and anadromous fish and or big game winter ranges which provide a source of carrion.

Bald eagles typically select diurnal perch sites that will provide an adequate view of foraging areas which in turn allows them to conserve energy and maximize foraging opportunities. Stands with deciduous trees are preferred as perch trees due to their structural characteristics of providing larger branches near the top of the tree and tree heights extending above the forest canopy. Eagles are known to roost up to 7 miles from their foraging areas. Selection of nocturnal roosting habitat is based on landform and availability of coniferous forests. Eagles most often roost near a rich food source up off valley bottoms in draws that are free from disturbance and provide suitable microclimates which facilitate energy conservation. Roost sites are usually selected in uneven-aged stands containing old growth components. Selection of roost trees within uneven-aged stands is based on a preference for the largest and oldest trees with an open branching pattern in the top half of the tree. Eagles are also known to use traditional roosting sites and trees year after year (Magaddino, 1989).

The Selway District, Nez Perce National Forest in central Idaho is within Zone 15 of the Pacific Bald Eagle Recovery Plan (1986). The Recovery Plan objectives for Zone 15 are to provide secure habitat for a minimum of six bald eagle nesting territories and occupation within Zone 15 by a minimum of four breeding bald eagle pairs that will be self-sustaining over the long-term and maintain genetic variability within the population. Key areas with associated recovery goals have been identified by the Recovery Plan. The Selway Ranger District is not located within a key area, however, the district is located to the south of the "Clearwater/Dworshak" key area. The Pacific Bald Eagle Recovery Plan identifies the major threats to bald eagle habitats or populations within Zone 15 as:

* Logging
* Recreation
* Loss of food supply
* Indiscriminate shooting
* Private land development
* Mining
* Road Construction
* Water fluctuations at dams

The Pacific Bald Eagle Recovery Plan suggests management proposals for Zone 15 which would:

* Enhance restoration of anadromous fisheries;

* Locate nesting pairs and increase nesting populations;
* Protect existing nest sites; and,
* Regulate levels of human disturbance.

The Zone 15 recovery goals for breeding pairs have been accomplished. However, the ability of these pairs to be self-sustaining over the long-term has not been established (R. Howard and K. Steenhof, pers. comm. w/ Clearwater RD Wildlife Biologist, Denise Washick, 1990).

The lower Selway and Middle Fork Clearwater Rivers on Selway Ranger District, Nez Perce National Forest, are identified as wintering areas for bald eagles. These major stream/riverine habitats currently provide suitable wintering habitat. A minor portion of the extreme lower elevations of the Upper Swiftwater study area borders the lower Selway River.

Review of historical records indicate that random observations have been recorded for bald eagles dating back prior to 1980. These sightings occurred from September through April.

Food may be a limiting factor (Johnson, 1990) for bald eagles on the Nez Perce National Forest. The primary food source for bald eagles on the Nez Perce National Forest is carrion found on the Middle Fork Clearwater and Selway River and big game winter ranges. The Selway Ranger District provides winter range habitat for ungulates which provide a source of carrion for bald eagles. These rivers are known to freeze over in the winter which further elevates the importance of carrion to wintering bald eagles.

Criteria for Evaluating Potential Bald Eagle Habitat

The preferred action were assessed for suitable bald eagle habitat based on the following criteria and rationale:

Diurnal Perching Habitat

Criteria 1: Located w/in one mile of food source

Perch selection for wintering bald eagles is primarily influenced by the proximity to food sources (Paige et al. 1991). One mile was a subjective measurement based on district reports which indicate sightings generally occur within approximately one mile of available food sources located in the river and winter range.

Criteria 2: Perching Structures in the study area

Height is the determining factor in selection of perching sites (J. Crenshaw, pers. comm. 1990). The "Pacific Bald Eagle Recovery Plan" (1986) referenced that snags often provide unobstructed views and are taller than surrounding vegetation. Trees with snag characteristics and ability to stand for some time are considered as potential habitat. Trees suitable as perch sites as determined by direct field observations at/near the study area.

Criteria 3: Proximity to Human Disturbance

Sites are deterimined as: 1) secure (no roads or trails); 2) roaded; or 3) having trails. These are relative values and can only be used to evaluate stands relative to each other within the analysis area. Types of disturbance from humans would result in foot traffic vs. vehicle traffic, whereby road vehicles present the least amount of disturbance vs. presence of humans on foot or ATV's, etc. (Pacific Bald Eagle Recovery Plan, 1986).

Roosting Habitat

Criteria 1: W/in Approximately Seven Miles of Food Source

Personal communication by Denise Washick with R. Howard in 1989 during the Wing-Creek Twentymile EIS (Clearwater Ranger District, Nez Perce National Forest) stated that eagles are known to roost up to seven miles away from rivers and large bodies of water, primarily within stream canyons. Additionally the Pacific Bald Eagle Recovery Plan (1986) noted that in Klamath, Oregon eagles roosted approximately nine miles from their primary food sources.

Criteria 2: Site Thermal Properties

Thermal properties provided are more important than perching structures for night roosting for conservation of energy and protection from weather. (Bald Eagle Recovery Plan 1986). Stands considered to provide thermal were those stands containing 14.0 "+ diameter trees with 70% canopy closure and a minimum of 40 feet in height.

Criteria 3: Protected Landform (w/in canyons)

Protected or sheltered landforms provide suitable microclimates and facilitate energy conservation. (Pacific Bald Eagle Recovery Plan, 1986).

Criteria 4: Proximity to Human Disturbance

Sites are deterimined as: 1) secure (no roads or trails); 2) roaded; or 3) having trails. These are relative values and can only be used to evaluate stands relative to each other within the analysis area. Types of disturbance from humans would result in foot traffic vs. vehicle traffic, whereby road vehicles present the least amount of disturbance vs. presence of humans on foot or atv, etc. (Pacific Bald Eagle Recovery Plan, 1986).

1. Current Situation/Activity Evaluation

Per the Pacific Bald Eagle Recovery Plan, four actions are necessary to recover and protect this species. These are:

* Enhance restoration of anadromous fisheries;
* Locate nesting pairs and increase nesting populations;
* Protect existing nest sites; and,
* Regulate levels of human disturbance.

The following synopsis describes these four actions as they pertain to the preferred action.

a. Restore Anadromous Fisheries

The Selway River supports steelhead trout and chinook salmon. The habitat potentilly effected by this project is spawning and rearing habitat for the classified endangered mainstem fall chinook salmon (a separate Biological Assessment is being prepared by the District Fisheries Biologist for this species). The preferred action is not expected to either enhance or degrade anadromous fish or their habitats.

b. Locate Nesting Pairs/Increase Nesting Populations

No active bald eagle nests are known or suspected in the Selway, Lochsa and Middle Fork Clearwater River drainages.

c. Protect Existing Nest Sites

No active bald eagle nests are known or suspected in the Selway, Lochsa and Middle Fork Clearwater River drainages.

d. Regulate Human Disturbance

There is light disturbance to the margin of the study area (and within the river cooridor) during the winter. This is from unrestricted vehicle traffic (mostly by cougar hunters) on the Selway River Road (Road 223). In most years, this section of the Selway River is essentially frozen over. Bald eagles only use this portion of the Selway River when the river is free of ice.

2. Conservation and Recovery Efforts

Past and current measures utilized by the Nez Perce National Forest for the conservation and recovery of the bald eagle on the Nez Perce National Forest:

* Participation in the annual bald eagle winter census coordinated by the USF&WS.

3. Evaluation Summary and Conclusion

A **Level C Survey** for bald eagle habitat characteristics was done in the Upper Swiftwater study area. For a Level C Survey, multiple entry surveys are conducted with survey areas being identified based on potential habitat and existing field knowledge. The surveys are conducted during the most favorable season suited for species identification. This survey level is used to estimate the probability of a listed species inhabiting the study area.

The Biological Assessment shows that **bald eagles are present** within the general area of the study area. Assessment of the survey results indicated that wintering bald eagles use the extreme lower elevations at the margin of the study area. The level of project activity and mitigations stated in this document will ensure that all of the on-site habitat features and characteristics which are essential for bald eagle recovery will remain intact. This is consistent with management objectives for bald eagle recovery on the Nez Perce Forest.

Year-round habitation may be possible because of habitat in the Clearwater River watershed may be suitable for nesting. However, no nesting occurs in the area.

No critical bald eagle habitat features would be disturbed by the preferred action. The level of preferred action within the Upper Swiftwater study area, by itself or in combination with other Forest Service management practices, will not diminish the bald eagle population or its habitat. Thus, we can determine with this Biological Assessment that the preferred action will have **"No Affect"** bald eagle or the critical features its habitat.

4. Conflict Determination

Potential conflicts between bald eagle recovery efforts and the preferred action will be resolved to benefit the eagle. Should a potential or real conflict arise, the situation will be dealt with on an incident or site specific basis through consultation with the USF&WS and IDF&G.

5. **Consultation wiht US Fish and Wildlife Service**

   7/13/92, letter from USF&WS to Corps of Engineers (cc to Selway Rgr Dist).

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U.S. Department of Agriculture. 1978. Bald Eagle Essential Habitat Northern Region. USDA. September 1978.

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This concludes the Biological Assessment required by the Endangered Species Act and 50 CFR 402.12. The project is expected to "Not Likely to Adversely Affect" or have "No Affect" on the recovery or viability of any threatened or endangered species in the assessment area.

This action is of limited scope and intensity. No extraordinary circumstances exist that would cause this preferred action to have significant adverse effects on the human environment. This preferred action is consistent with the Nez Perce Forest Plan and National Forest Management Act.

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