U.S. Department of the Interior
Bureau of Land Management

DRAFT

Oregon State Office

Lakeview Grazing Management Environmental Impact Statement

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

OREGON STATE OFFICE
P.O. Box 2965 (729 NE Oregon Street)
Portland, Oregon 97208

Enclosed for your review and comment is the Lakeview Grazing Management Draft Environmental Impact Statement (DEIS). The statement analyzes the impacts which would result from the proposed livestock management program and five alternatives. The purpose of the statement is to disclose the probable environmental impacts and to assure that these impacts are considered along with economic, technical and other considerations in the decisionmaking process. In using this analysis, readers should keep in mind that an EIS (draft or final) is not the decision document. The decisionmaking process is described in Chapter 1, Implementation of the Decision, in the draft EIS.

Comments concerning the adequacy of this statement will be considered in the preparation of the final environmental impact statement. The comment period will end June 29, 1981. Oral and/or written testimony will be accepted at a public hearing which will be held 7:00 p.m., June 18, 1981, at the BLM district office, 1000 Ninth St. S. in Lakeview, Oregon. Prior to the public hearing, BLM staff will answer questions concerning the draft EIS at an informal meeting to be held at 7:30 p.m., June 4, 1981, at the Lakeview District Office.

This draft may be incorporated into the final EIS by reference only. The final EIS then would consist of public comments and responses and any needed changes of the draft. Therefore, please retain this draft EIS for use with the final.

Comments received after the close of the comment period will be considered in the decision process, even though they may be too late to be specifically addressed in the final environmental impact statement.

Your comments should be sent to:

Oregon State Director (922)
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Sincerely yours,

William D. Leavell

State Director

DEPARTMENT OF THE INTERIOR

DRAFT

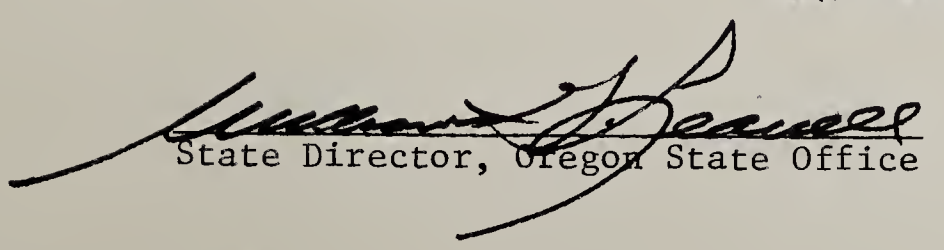
ENVIRONMENTAL IMPACT STATEMENT

LAKEVIEW GRAZING MANAGEMENT PROGRAM

Prepared by

BUREAU OF LAND MANAGEMENT

DEPARTMENT OF THE INTERIOR



State Director, Oregon State Office

LAKEVIEW PROPOSED GRAZING MANAGEMENT

Draft (x) Final ( ) Environmental Impact Statement
Department of the Interior, Bureau of Land Management

1. Type of Action: Administrative (x) Legislative ( )

2. Abstract: The Bureau of Land Management proposes to implement livestock grazing management on 3,342,026 acres of public land in south central Oregon. Grazing management is proposed on 3,199,842 acres (185 allotments), unalloted status on 137,844 acres and elimination of livestock grazing on 4,340 acres (2 allotments). Implementation of the proposed action includes allocation of vegetation to livestock, wild horses, wildlife and nonconsumptive uses; establishment of grazing systems; and construction of range improvements. Vegetation condition would improve and forage production would increase. Overall watershed conditions would improve. Big game populations are not expected to change. The numbers of upland game birds and fish would increase. There would be an initial decrease in allocation to livestock of 9,544 animal unit months (AUMs) in 17 allotments and an increase of 2,382 AUMs in 21 allotments for a net decrease of 4 percent. In the short term, one operator would have losses exceeding 10 percent of annual forage requirements under the proposed action. Direct and indirect community personal income would be increased by approximately $41,000 annually in the short term and $581,000 over existing conditions in the long term.

3. Alternatives Analyzed:

a. No Action
b. Eliminate Livestock Grazing
c. Optimize Livestock Grazing
d. Optimize Wild Horse Numbers of Existing Herd Units
e. Optimize Wildlife and Nonconsumptive Uses

4. Draft statement made available to EPA and the public late April 1981. The comment period will be 60 days beginning after the draft is filed with the Environmental Protection Agency and the Notice of Availability is published in the Federal Register. This notice is anticipated in April, 1981.

5. For further information contact:

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Oregon State Office
P.O. Box 2965 (729 N.E. Oregon St.)
Portland, Oregon 97208
Telephone: (503) 231-6951

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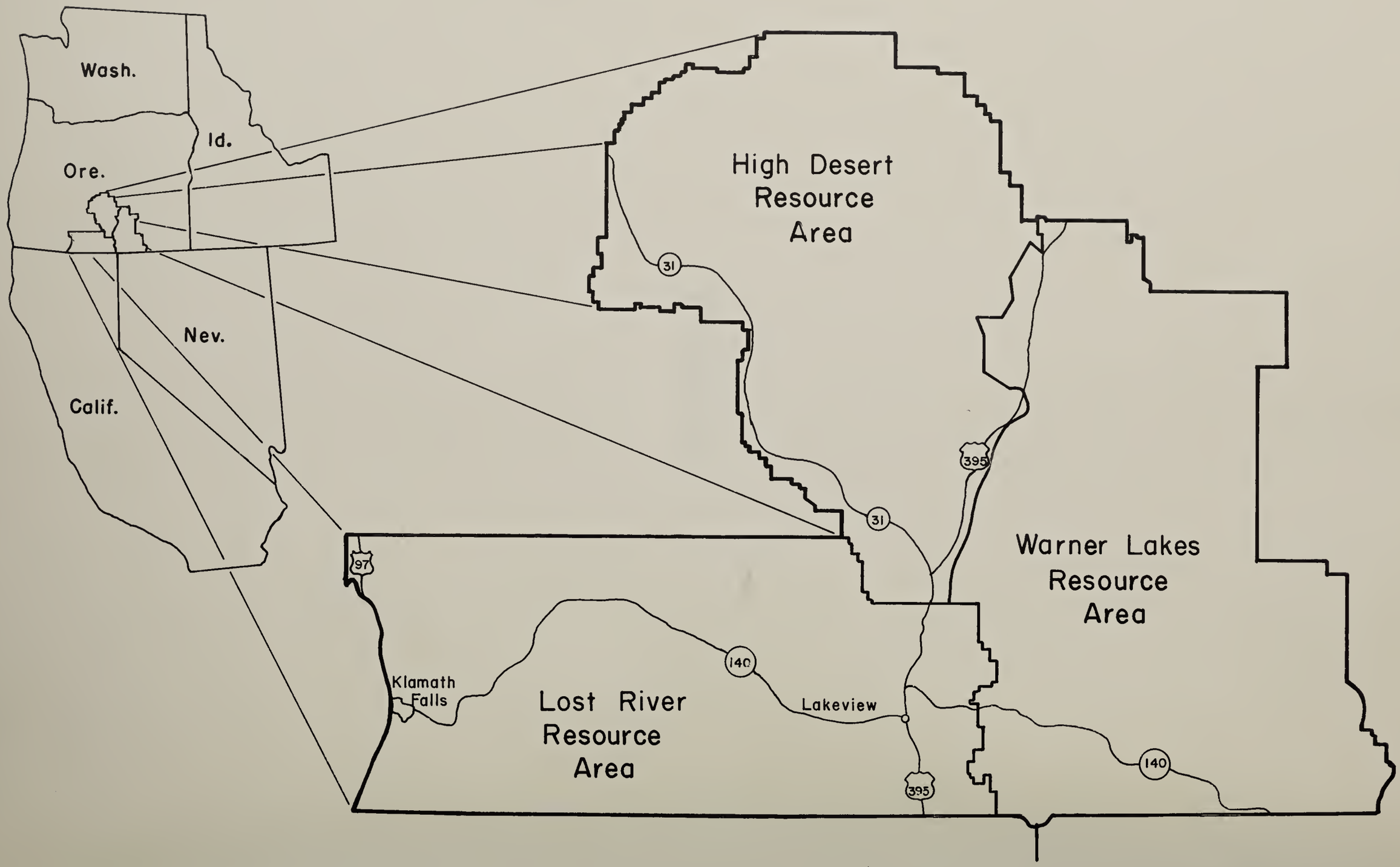
LAKEVIEW EIS



SUMMARY

This environmental impact statement (EIS) describes and analyzes the environmental impacts of implementing a livestock grazing management program in the Lakeview District in south central Oregon. The proposed action, developed through the Bureau planning system using public input, is the preferred alternative. Five other alternatives are also described and analyzed for environmental impacts.

The proposed action consists of range improvements, vegetation allocation and implementation of grazing management on 185 allotments covering 3,199,842 acres of public land, continued unallotted status (no authorized livestock grazing) on 137,844 acres and elimination of livestock grazing on two allotments covering 4,340 acres.

The purpose of the proposed action is to implement planning decisions needed for management, protection and enhancement of the rangeland resources. The proposal would cover a 20-year period; 10 years for implementation and 10 additional years to achieve objectives.

Under the proposed action, the existing forage production of 183,187 AUMs would be allocated to livestock (159,292 AUMs), wildlife (15,319 AUMs), wild horses (3,420 AUMs) and nonconsumptive uses (5,156 AUMs). The allocation to livestock constitutes a 4 percent reduction from the 1979 active preference of 166,454 AUMs.

Livestock grazing would be reduced initially by 9,544 AUMs in 17 allotments. These reductions range from 2 to 3,488 AUMs. Livestock grazing would be increased by 2,382 AUMs in 21 allotments. These increases range from 1 to 355 AUMs by individual allotment. In the long term, implementation of grazing systems and range improvements would result in future forage production of 248,022 AUMs. It is anticipated that this would be allocated to livestock (222,948 AUMs), wildlife (21,076 AUMs), wildhorses (3,420 AUMs), and nonconsumptive uses (578 AUMs).

Spring grazing would be implemented on 144,602 acres, spring/summer grazing on 136,650 acres, spring/fall grazing on 12,991 acres, deferred grazing on 89,669 acres, deferred rotation grazing on 169,205 acres, rotation grazing on 72,234 acres, rest rotation grazing on 3,208,471 acres and winter grazing on 311,010 acres.

Proposed range improvements include 147 reservoirs, 18 springs, 28 wells, 135 waterholes, 103.8 miles of pipeline, 427.7 miles of fence and 71 guzzlers. Vegetation manipulation is proposed for 266,486 acres and would consist of brush control on 61,748 acres and preparation for seeding on 202,868 acres by spraying 2,4-D herbicide, burning or chaining; seeding 202,868 acres; and juniper control on 1,870 acres.

Five alternatives to the proposed action were analyzed:

1. No Action - Under this alternative, there would be no change from present management conditions. The existing forage production would be allocated to wildlife (166,454 AUMs) and wildlife (10,916 AUMs). No additional range improvement projects or grazing systems would be undertaken.

2. Eliminate Livestock Grazing - This alternative would eliminate all authorized livestock grazing from all public lands except trailing use. No range improvements would be constructed.

3. Optimize Livestock Grazing - In the long term, this alternative would provide 127,494 AUMs more than the proposed action from implementation of the following additional improvements: 362,948 acres seeding, 943,941 acres brush control, 3,070 acres juniper control, 2 miles of fence, 14 springs, 14 wells, 26 miles of pipeline, 102 reservoirs and 10 waterholes. The two wild horse herds would be managed at 30 animals each. All riparian areas except those from which livestock are presently excluded would be grazed. The initial allocation of forage production would be the same as that under the proposed action. The anticipated future forage production of 384,621 AUMs would be allocated to livestock (350,442 AUMs), wildlife (33,232 AUMs), wild horses (720 AUMs), and nonconsumptive uses (227 AUMs).

4. Optimize Wild Horse Numbers of Existing Herd Units - This alternative is the same as the proposed action except in the two wild horse herd management areas. In the long term, this alternative would allocate 44,384 AUMs less for livestock than the proposed action by eliminating livestock grazing in the two herd areas and allocating vegetation for a maximum of 2,100 wild horses.

5. Optimize Wildlife and Nonconsumptive Uses - In the long term, this alternative would provide 22,135 AUMs less for livestock than the proposed action by eliminating livestock from riparian and wetland areas, 19,500 acres of crucial deer winter range and 26,000 acres of bighorn sheep seasonal and migratory ranges; limiting utilization of key species to 40 percent in pastures having a soil surface factor of 41 or more; and managing the two wild horse herds at 30 animals each.

ENVIRONMENTAL CONSEQUENCES

Vegetation

The vegetation allocation, grazing systems and range improvements under the proposed action and Alternatives 3 and 4 would increase the species composition of key plant species and thus increase forage production and residual ground cover, and improve range condition. The 40 percent utilization of key species under Alternative 5 and no grazing under Alternative 2 would also lead to increases in forage production, ground cover and range condition. Decreases in these vegetative characteristics would occur on allotments that are overstocked under Alternative 1. Fencing riparian areas under the proposed action and Alternatives 4 and 5, and elimination of grazing under Alternative 2 would significantly improve the condition of riparian vegetation. The standard procedures and design elements would prevent impacts to proposed threatened and endangered plants from construction of range improvements.

Soils

The increase in residual ground cover would reduce soil erosion under the proposed action and Alternatives 2, 3, 4 and 5. Erosion would increase on allotments that are overstocked under Alternative 1. Elimination of livestock grazing under Alternative 2 would decrease streambank erosion on 102.2 stream miles. Fencing of riparian areas and the rest rotation, spring and rotation grazing systems would decrease streambank erosion on 93.0 stream miles under the proposed action and Alternative 4, 85.8 miles under Alternative 3, 100.6 miles under Alternative 5 and 71.1 miles under Alternative 1. Burning as a method of vegetative manipulation would lead to wind erosion on 5,760 acres of sandy and ashey soils under the proposed action, 12,000 acres under Alternative 3, 3,560 acres under Alternative 4 and 10,560 acres under Alternative 5.

Water

Construction of range improvements would cause short-term increases in sediment yield of less than 2 percent under the proposed action and Alternatives 4 and 5, and 4.5 percent under Alternative 3. In the long term, the increase in residual ground cover would reduce sediment yield. Runoff would decrease slightly under Alternative 2 and would remain the same under the proposed action and the other alternatives.

Wildlife

Under the proposed action and Alternatives 3, 4 and 5, trend on 17,000 acres of crucial deer winter range and 5,000 acres of crucial antelope range would decline due to forage competition between big game and livestock caused by early livestock turnout dates. An additional 159,000 acres of crucial range would decline under Alternative 3 due to vegetative manipulation. Approximately 234,000 acres would decline from vegetation stagnation in Alternative 2. No substantial impacts to big game populations are expected under the proposed action or any alternatives. Fish and wildlife habitat condition in all riparian areas and wetlands would improve with Alternatives 2 and 5 and 20 percent would improve with the proposed action and Alternative 4. The condition would not change for the remaining riparian areas and wetlands under the proposed action and Alternatives 1, 3 and 4. Vegetation manipulation would reduce cover, thus resulting in decreased populations of small mammals, birds and reptiles. This reduction in cover would be in direct relationship to the magnitude of manipulation under each alternative. The standard procedures and design elements would prevent impacts to threatened and endangered animals from construction of range improvements.

Recreation

Implementation of Alternative 1 would have no effect on long-term projected visitor use. Alternative 2 would result in visitor use increases in most activities. Under the proposed action and Alternatives 3, 4 and 5, recreational use reductions or increases associated with certain activities would occur in specific localities.

Cultural Resources

The grazing systems and/or range improvements in the proposed action and Alternatives 1, 3, 4 and 5 could disturb unidentified cultural sites and the integrity of some known sites.

Visual Resources

The grazing systems and range improvements would create visual contrasts under the proposed action and Alternatives 3, 4 and 5, but in the long term, visual quality would improve as range condition improves. Under Alternative 1, visual contrast would not increase over that under the existing situation. The elimination of grazing under Alternative 2 would improve visual quality.

Wild Horses

The construction of range improvements under the proposed action and Alternatives 3 and 5 would cause a short-term disturbance to the horses. Wild horses would be allowed to increase to 2,100 head under Alternative 4, would be 360 head under the proposed action and Alternatives 1 and 2, and would be reduced to 60 head under Alternatives 3 and 5.

Areas of Critical Environmental Concern

Of those two areas proposed for ACEC designation, the Lost Forest would be adversely impacted by 2,400 acres of spraying for brush control under Alternative 3.

Special Areas

Under the proposed action and Alternatives 4 and 5, slight impacts would occur to the relatively undisturbed nature of the Warner Valley potential National Natural Landmark. Under Alternative 3, the additional range improvements above the proposed action would result in additional adverse impacts in Warner Valley.

Socioeconomics

One operator would lose public forage exceeding 10 percent of total annual forage requirements in the short term under the proposed action. No change would occur under Alternative 1. Under the other alternatives, a maximum of five operators would lose more than 10 percent of their annual requirements except Alternative 2 under which 67 operators would experience such losses.

In the long term, the number of operators having losses greater than 10 percent of annual forage requirements would remain the same as the short term for the proposed action and Alternatives 2 and 4, and would be reduced for Alternatives 3 and 5. With the exception of Alternative 2, not more than three operators would have forage losses greater than 10 percent of requirements.

Personal income in the short term under the proposed action would be increased by $1.0 million annually during the construction period. Personal income would be reduced by $1.2 million annually under Alternative 2, but it would be increased under every other alternative except Alternative 1 (No Change). In the long term, personal income under the proposed action would be increased $588,000 annually.

Under Alternative 2, the loss occurring in the short term would be continued in the long term. For the other alternatives, personal income would be increased (with the exception of Alternative 1 which would cause no change) by an amount ranging from $216,000 to $1,550,000 annually.

PURPOSE AND NEED

PURPOSE AND NEED

This environmental impact statement (EIS) analyzes the impacts of implementing a livestock grazing management program on public lands administered by the BLM in the Lakeview District in south central Oregon, referred to as the Lakeview EIS area (see Figure 1-1, folded maps inside back cover).

The Bureau of Land Management (BLM) is responsible for management of livestock grazing use on public lands in a manner that would maintain or improve the public land resources including soil, water, vegetation and wildlife habitat. The Bureau's principal authority and direction to manage lands are found in the Taylor Grazing Act of 1934, Federal Land Policy and Management Act of 1976 (FLPMA) and Public Rangelands Improvement Act of 1978.

The purpose of the proposed action is to implement planning decisions needed for management, protection and enhancement of the rangeland resources. Grazing management consisting of grazing systems and improvements would provide for maintenance and improvement of vegetation.

The proposed action is a livestock grazing program consisting of vegetation allocation and implementation of grazing systems and range improvement projects. This action is needed to maintain or improve conditions. Range condition on 738,970 acres is poor, on 1,773,713 acres is fair and on 596,154 acres is good. Approximately 46 percent of the watershed is in the stable or slight erosion condition class, 50 percent in the moderate erosion condition class and 4 percent in the critical and/or severe erosion condition class. Stream-side wildlife habitat is in poor condition along 16 miles (15 percent), fair condition along 34 miles (32 percent), good condition along 4 miles (4 percent) and unknown condition along 52 miles (49 percent).

In addition to the proposed action, five alternatives will be analyzed: No Action, Eliminate Livestock Grazing, Optimize Livestock Grazing, Optimize Wild Horses, and Optimize Wildlife and Nonconsumptive Uses.

The proposed action is the preferred alternative and was developed through the Bureau Planning System using public input. Significant land and resource use alternatives considered during the planning process which would affect the rangeland resources are addressed in the alternatives analyzed in this EIS.

The significant issues and alternatives were defined after and as a result of a public scoping meeting in Lakeview, Oregon. See Appendix A for discussion of the relevance of other proposed alternatives.

The EIS, along with additional data, will provide the decisionmaker with information to select a management program considering resource conditions as well as social and economic impacts.

CHAPTER I

PROPOSED ACTION AND ALTERNATIVES

CHAPTER 1 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The proposed action and alternatives would directly involve 3,342,026 acres of public land. There are an additional 13,019 acres of other Federal land, 11,449 acres of State land and 266,604 acres of private land within the allotments (as shown in Figure 1-1).

Grazing management is proposed for 187 allotments on 3,204,182 acres of public land in the Lakeview District. Most allotment-specific data are displayed in tables in Appendix B. In the Proposed Action and all alternatives unallotted status (no authorized grazing) would be continued on 137,844 acres of public lands as shown on Figure 1-1. Grazing would be discontinued in Allotments 714 and 1307 on 4,340 acres of public lands resulting in unallotted status. No range improvements, allocations or grazing systems are planned on the unallotted lands. Unallotted status would be continued until an application for grazing of these lands is approved. Further environmental assessment would be required prior to authorizing grazing on these lands.

In addition to the proposed action, five alternatives are analyzed in this document:

Alternative 1	No Action (No Action)
Alternative 2	Eliminate Livestock Grazing (Elim. Lvstk.)
Alternative 3	Optimize Livestock Grazing (Opt. Lvstk.)
Alternative 4	Optimize Wild Horse Numbers in Existing Herds (Opt. Horses)
Alternative 5	Optimize Wildlife and Nonconsumptive Uses (Opt. Other)

The alternatives differ from the proposed action in three ways: (1) the allocation of vegetation, (2) the types of grazing systems to be applied and (3) the kind and amount of range improvements to be constructed. The section in this chapter titled Components of the Proposed Action and Alternatives describes these three elements. Table 1-1 summarizes the components of the proposed action and alternatives.

PROPOSED ACTION

The general objectives of the proposed action are to:

- Improve or maintain riparian vegetation on 694 acres and wetland wildlife habitat on 12,696 acres by use of grazing systems, restrictive use or by exclusion of livestock grazing.

- Improve instream water quality by implementation of livestock management (exclusions and/or grazing systems).

- Provide forage for wildlife by initially allocating 15,319 AUMs of livestock forage and an additional 5,757 AUMs in the long term to meet Oregon Department of Fish and Wildlife management objectives.

Table 1-1 Summary of Components

Anticipated Long-Term Vegetation Allocation (AUMs) 1/	Proposed Action	No Action Alt. 1 2/	Eliminate Livestock Alt. 2	Optimize Livestock Alt. 3	Optimize Horses Alt. 4	Optimize Others Alt. 5
Wildlife	21,076	13,172	15,319	33,232	19,720	31,488
Wild Horses	3,420	0	3,420	720	25,200	720
Nonconsumptive	578	0	164,448	227	7,733	14,990
Livestock	222,948	166,454	0	350,442	178,564	200,813
Grazing Systems (acres)						
Spring	144,602	99,864	0	144,612	39,412	143,622
Spring/Summer	136,650	1,373,752	0	136,750	84,863	132,124
Spring/Fall	12,991	21,237	0	13,011	12,991	12,991
Deferred	89,669	96,956	0	89,789	89,669	85,957
Deferred Rotation	169,205	17,958	0	169,205	145,679	167,625
Rotation	72,234	121,899	0	72,234	72,234	71,734
Rest Rotation	2,208,471	1,067,212	0	2,209,177	1,673,912	2,145,809
Winter	311,010	328,543	0	311,010	311,010	309,530
Exclusion	16,602	4,746	3,204,182	15,646	731,664	94,640
Federal Range Fenced	23,529	22,929	0	23,529	23,529	20,931
Non-Use	19,219	49,086	0	19,219	19,219	19,219
Unallotted	137,844	137,844	137,844	137,844	137,844	137,844
Proposed Range Improvements						
Fence (miles)	427.7	0	0	429.7	319.7	613.7
Spring (each)	18	0	0	32	18	18
Pipeline (miles)	103.8	0	0	129.8	83.8	103.8
Wells (each)	28	0	0	42	27	28
Guzzler (each)	71	0	0	71	71	71
Reservoir (each)	147	0	0	249	105	147
Waterhole (each)	135	0	0	145	135	135
Vegetation Manipulation (total acres)	266,486	0	0	1,576,445	190,886	266,486
Spray/seed (acres)	110,618	0	0	344,653	80,218	44,356
Burn/seed (acres)	84,730	0	0	194,673	72,530	150,992
Chain/seed (acres)	7,520	0	0	26,490	5,760	7,520
Brush Control/ Spray (acres)	33,320	0	0	778,560	11,320	0
Brush Control/ Burn (acres)	28,323	0	0	226,919	19,083	61,643
Brush Control/ Chain (acres)	105	0	0	210	105	105
Juniper Control (acres)	1,870	0	0	4,940	1,870	1,870

1/ Long-term vegetation allocation for Alternatives 1 and 2 has not been projected; therefore, the short-term allocation is shown.

2/ Alternative 1 displays data for the existing situation except for range improvements. The vegetation allocation shown for livestock is the 1979 active preference.

- Maintain 160 to 360 wild horses in two herd management areas by allocating 3,420 AUMs of livestock forage.

- Reduce erosion by improving range condition.

- Increase long-term vegetation allocation to livestock from the proposed initial allocation of 159,292 to 222,948 AUMs by increasing forage production.

Proposed Vegetation Allocation

Initially, the proposal would allocate the present livestock forage production of 183,187 AUMs to: livestock (159,292), wild horses (3,420), wildlife (15,319) and nonconsumptive uses (5,156). This is a reduction of 4.3 percent or 7,162 AUMs in livestock use from the 1979 authorized use of 166,454 AUMs. The existing livestock grazing (1979 active preference) and proposed vegetation allocation by allotment are shown in Appendix B, Table B-1. Presently there are 13,172 AUMs allocated to wildlife and none to wild horses.

Grazing in 21 allotments would be increased by a total of 2,382 AUMs. Grazing in 17 allotments would be reduced by a total of 9,544 AUMs. The proposed increases are the result of successful land treatments and/or past management. The downward adjustments in livestock use are proposed to balance livestock grazing and other resource needs with the present usable forage production as shown in Appendix B, Table B-1.

Over the 10-year period following full implementation, the proposed action is expected to increase annual forage production by 64,835 AUMs. For the purpose of impact analysis, it is assumed that the increased forage production will be allocated to livestock and wildlife at the same proportion as the proposed allocation shown in Appendix B, Table B-1. For the three resource areas, these proportions would be:

	Percent Livestock	Percent Wildlife
Lost River	84	16
High Desert	88	12
Warner Lakes	93	7

Allocation of competitive forage for wild horses and nonconsumptive uses is projected to remain at the same level as shown in Appendix B, Table B-1. Actual decisions on the allocation of increased forage will not be made until the forage is produced and all needs at that time are considered through the Bureau planning system.

Grazing Systems

Existing and proposed grazing systems by allotment are shown in Appendix B, Table B-2. See Components of the Proposed Action and Alternatives section for a detailed description of each grazing system.

Exclusion of livestock grazing is proposed for several areas summarized in Table 1-2. Figure 1-2 shows the location of these exclusion areas. Most of the exclusion is proposed in order to improve the wildlife habitat condition of riparian areas and wetlands. Exclusion is proposed on one allotment (1307) in order to protect a population of the plant species Eriogonum prociduum, a plant under review by the Fish and Wildlife Service for listing as threatened or endangered status. Allotment 714 receives very little grazing due to lack of livestock water. The grazing preference would be transferred to Allotment 716.

Table 1-2 Livestock Exclusion Areas

	Existing 1/		Proposed		Total	
	Number	Acres	Number	Acres	Number	Acres
Stream (miles)	17.0	1,849	10.7	683	27.7	2,532
Springs (each)	91	82	1	3	92	85
Reservoirs (each)	7	2,236	1	160	8	2,396
Other (each) 2/	23	579	5	11,010	28	11,589
Total		4,746		11,856		16,602

1/ All exclusion areas anticipated as being completed Spring 1981 have been shown as existing in this table and Figure 1-2.

2/ Other includes study plots, air strips, T&E plant areas, Fossil Lake, etc.

Temporary exclusion or restrictive use is proposed for several areas in the Lost River Resource Area and one area in the High Desert Resource Area (see Figure 1-2).

On 1,720 acres in the Lost River Resource Area, livestock would be excluded by fencing for 3-5 years or until the riparian vegetation improves to good condition. The areas would remain fenced from the balance of the pasture for livestock control. After the desired improvement is obtained, livestock grazing would be allowed in the restricted area at the same time as the pasture in which it is located. However, because livestock tend to concentrate on these sites, the desired degree of utilization would occur earlier on these sites than in the surrounding pasture. Therefore, when the desired degree of utilization occurs within the restrictive areas, livestock would be removed. At no time would utilization of key species be allowed to exceed 50 percent within the restrictive areas.

In the High Desert Resource Area, 12 riparian acres along Upper Bridge Creek would be fenced to restrict livestock grazing. Livestock grazing would be allowed every other year during the month of October. Herbaceous key species would be heavily utilized during this period.

5 4 3 2 1 0 5
SCALE IN MILES

LEGEND

- Existing Exclusion
- Proposed Exclusion
- Proposed Restrictive Use

LIVESTOCK EXCLUSION & RESTRICTIVE USE AREAS

Figure 1-2a

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

HIGH DESERT RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

WARNER LAKES RESOURCE AREA

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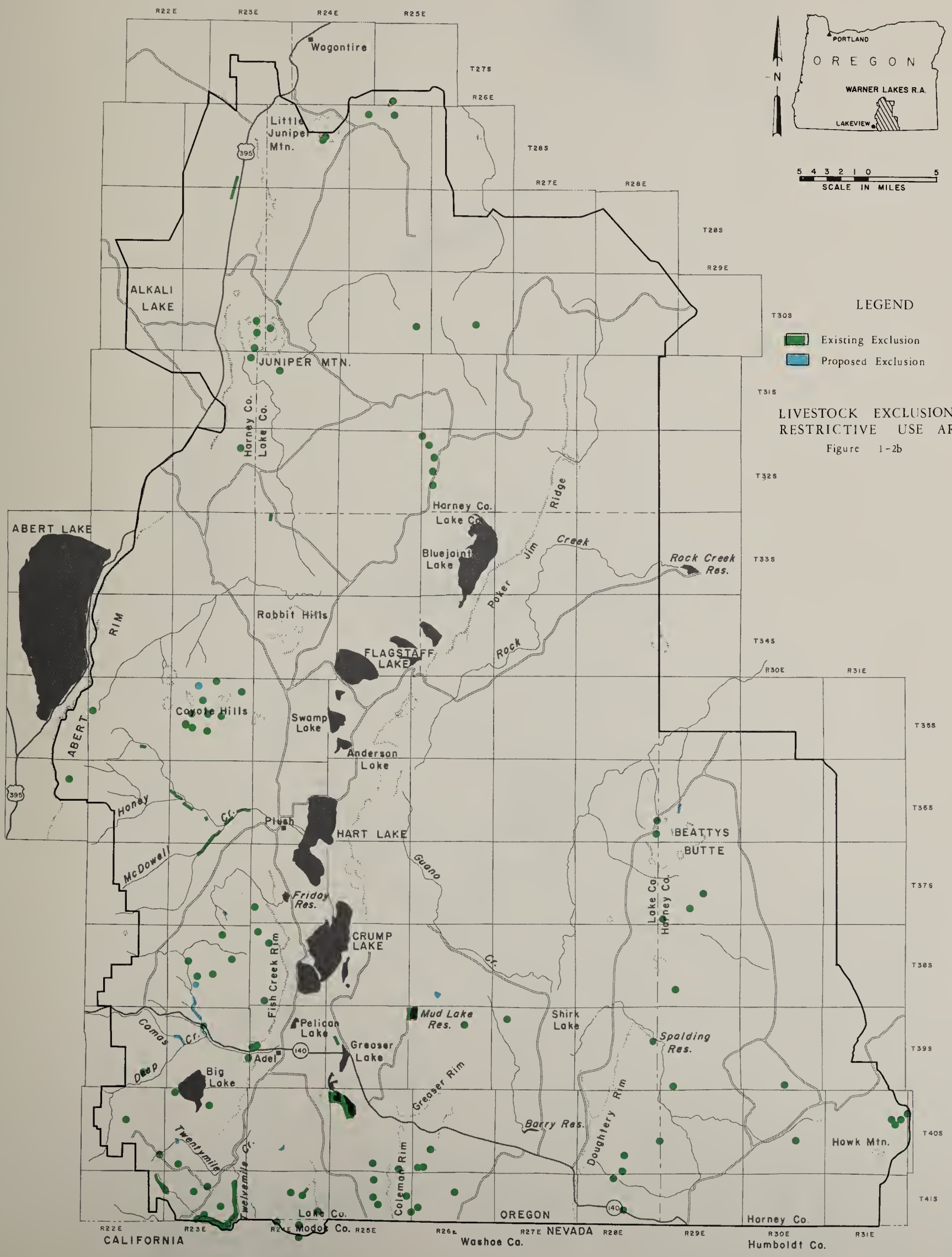
Environmental Impact Statement
1981



LEGEND

- Existing Exclusion
- Proposed Exclusion

LIVESTOCK EXCLUSION & RESTRICTIVE USE AREAS

Figure 1-2b

LEGEND

- Existing Exclusion
- Proposed Exclusion
- Proposed Restrictive Use

LIVESTOCK EXCLUSION & RESTRICTIVE USE AREAS

Figure 1-2c

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

LOST RIVER RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

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5 4 3 2 1 0 5
SCALE IN MILES

Several allotments are proposed to be combined in order to facilitate grazing management. These combinations are:

400 Paisley Common and 417 C&J Use Area
404 Willow Creek and 405 East Clover Flat
412 Fir Timber Butte and 413 Mill Creek
705 Oatman Flat and 715 Connelly Hills
711 South Hayes Butte and 912 East Hayes Butte
876 Bear Valley, 889 Timber Hill, 890 Willow Valley and 891 Willow Valley Chaining
836 Harpold Chaining and 837 Bryant-Horton
856 Bryant-Stastny, 857 Bryant-Taylor and 895 Harpold Canyon
831 Warlow, 833 Bryant-Johnson and 839 Bryant-Loveness.

Range Improvements

Additional range improvements are usually needed to implement intensive grazing management. Exact numbers of improvements have not been determined. However, Appendix B, Table B-3, presents an approximate number and type of water development, miles of fence and acres of vegetation manipulation needed to implement the proposed grazing systems. In the long term, implementation of vegetation manipulation projects would produce an additional 46,420 AUMs and implementation of the proposed grazing management would result in an additional 18,302 AUMs of forage.

ALTERNATIVE 1 - NO ACTION

This alternative constitutes a continuation of the present situation. There would be no change from present management conditions. Grazing permits and leases would continue to be issued at present levels of use. As shown in Appendix B, Table B-4, the vegetation allocation would continue at the present level (shown in Appendix B, Table B-1) of 166,454 AUMs for livestock and 13,813 AUMs for wildlife. For purposes of impact analysis, it is assumed that no additional range improvement projects would be undertaken or additional intensive grazing management implemented. By periodic control measures as described in the Wildhorse Herd Management Plans, wild horse numbers would be maintained at 60-110 head in the Paisley Herd Management Area and 100-250 head in the Beatys Butte Herd Management area. No specific vegetation allocation would be made for wild horses.

ALTERNATIVE 2 - ELIMINATE LIVESTOCK GRAZING

This alternative would eliminate all authorized livestock grazing on public lands administered by BLM except trailing use. Domestic livestock trailing permits would continue to be issued when necessary to allow livestock movement to or from private and State lands and lands administered by other Federal agencies. The wild horse herds would be allocated 3,420 AUMs to maintain the same levels of horses as in the proposed action (100-250 in Beatys Butte herd and 60-110 in Paisley herd).

Timber, wildlife, minerals, soil, water and recreation resources would be managed in accordance with the proposed Management Framework Plans (MFPs).

To achieve complete elimination of livestock grazing on public lands, an undetermined amount of fencing may be required to fence private and State lands. While existing range improvements on public lands would be left in place, only those benefiting other resource values would be maintained. No range improvements would be constructed.

ALTERNATIVE 3 - OPTIMIZE LIVESTOCK GRAZING

The objective of this alternative would be to allocate a high level of forage to livestock while maintaining or improving range conditions. See Appendix B, Table B-4, for anticipated long-term vegetation allocation. Vegetation allocation to wildlife and livestock would be at the same proportion as in the proposed action.

In the long term, this alternative would provide 127,494 additional AUMs above the proposed action level for livestock and would differ from the proposed action in the following ways:

- Protecting riparian areas on live streams to maintain existing water quality only through the use of grazing systems.

- Managing the Paisley and Beatys Butte wild horse herds for maintenance of 30 animals (360 AUMs) in each herd.

- Developing all practical and economically feasible range improvements for the benefit of livestock and wildlife.

Additional range improvements above those in the proposed action (Appendix B, Table B-3) are shown in Appendix B, Table B-5.

The proposed grazing systems would be the same as the proposed action. All riparian areas except those which are presently excluded from livestock grazing would be grazed. All other aspects of the proposed action would apply in implementation of this alternative.

ALTERNATIVE 4 - OPTIMIZE WILD HORSE NUMBERS OF EXISTING HERD UNITS

The objective of this alternative would be to allocate forage for the maximum number of wild horses (approximately 1,500 in Beatys Butte herd and 600 in the Paisley herd) which can be maintained within the present carrying capacity on the two wild horse herd management areas. In the long term, this alternative would provide 44,384 AUMs less than the proposed action level for livestock. See Appendix B, Table B-4, for anticipated long-term vegetation allocation. All livestock grazing would be discontinued in these herd management areas (see Chapter 2, Figure 2-4) to allow for maximum allocations of forage to wild horses. Long-term vegetation allocation to wildlife would be at the same level as in the proposed action, except in the wild horse herd areas.

In the wild horse herd areas, the allocation to wildlife would be made on the same percentage basis as under the proposed action for the available forage. However, there would be less total forage produced because some of the proposed vegetation manipulation projects would not be completed in the wild horse herd areas.

Wild horses are located within portions of three allotments. The proposed action range improvements located within wild horse herd management areas would not be constructed under this alternative. Table 1-3 shows the range improvements that would be constructed in the remaining portions of the three allotments as compared to the proposed action.

An additional 11 miles of fence with let-down gaps would be constructed in the Beatys Butte herd management area. All aspects of the proposed action would apply to the remaining portion of the EIS area.

Table 1-3 Range Improvements to be Constructed in Allotments with Wild Horses under Alternative 4

	Allot. #103		Allot. #400		Allot. #600	
	Alt. 4	Proposed Action	Alt. 4	Proposed Action	Alt. 4	Proposed Action
Fence (miles)	46.0	63.0	38.3	85.3	39.3	72.3
Wells (each)	3	3	4	5	0	0
Pipeline (miles)	23.0	27.0	21.5	23.5	6.0	20.0
Reservoirs (each)	2	2	4	4	10	52
Seeding (acres)						
Spray	31,903	31,903	14,355	27,795	0	16,960
Burn	13,830	20,870	14,014	14,014	17,320	22,480
Chain	0	0	0	0	0	1,760
Brush Control (acres)						
Spray	0	0	0	0	4,000	26,000
Burn	0	0	0	0	2,280	11,520

ALTERNATIVE 5 - OPTIMIZE WILDLIFE AND NONCONSUMPTIVE USES

The objective of this alternative is to benefit wildlife and nonconsumptive uses by allocating more forage to these uses and less to livestock grazing and wild horses than in the proposed action. See Appendix B, Table B-4, for anticipated long-term vegetation allocation.

This alternative would differ from the proposed action by:

- Allocating 22,135 fewer AUMs to livestock and 2,700 fewer AUMs to wild horses.

- Excluding livestock from major riparian areas and wetlands except for water gaps.

- Excluding livestock from 26,000 acres of bighorn sheep seasonal and migratory ranges and from 19,500 acres of crucial deer winter range.

- Limiting utilization of key species to 40 percent in pastures with a majority of the area having a soil surface factor of 41 or more; and to 50 percent utilization on pastures with a soil surface factor of 40 or less.

- Managing the Paisley and Beatys Butte wild horse herds for maintenance of a herd size of 30 animals (360 AUMs) each.

- Using burning as the method of vegetation manipulation on all sites which will carry fire except on soils with high erosion potential.

Livestock would be excluded from the riparian areas by fencing with some small water gaps (normally less than an acre) to allow livestock access to water. See Chapter 2, Figure 2-2, for location of riparian areas. Approximately 191 miles of fence would be required.

All other range improvements would be the same as the proposed action except in Allotment 523 where 5 miles of fence would not be constructed, and the vegetation manipulation projects which would be burned instead of sprayed, as shown on Table 1-4. The grazing systems would be the same as with the proposed action except that the degree of utilization by livestock on key species would be 40 percent on pastures having a soil surface factor of 41 or more.

Table 1-4 Vegetation Manipulation Projects to be Burned Instead of Sprayed under Alternative 5

Allotment Number	Seeding (acres)				Brush Control (acres)			
	Proposed Action		Alternative 5		Proposed Action		Alternative 5	
	Spray	Burn	Spray	Burn	Spray	Burn	Spray	Burn
212	1,600	1,440	0	3,040	280	1,080	0	1,360
215	800	0	0	800	0	1,280	0	1,280
511	4,240	4,800	4,240	4,800	2,240	0	0	2,240
514	1,760	680	0	2,440	4,800	0	0	4,800
600	16,960	22,480	0	39,440	26,000	11,520	0	37,520
103	31,903	20,870	10,551	42,222	0	0	0	0
400	27,795	14,014	4,005	37,804	0	0	0	0

COMPARISON OF IMPACTS

A summary comparison of impacts is displayed in Table 1-5. Detailed explanations of the impacts are given in Chapter 3 by resource.

Major issues include range condition, forage production, wildlife habitat condition and wild horse population. Alternative 3 would produce the most acres in good range condition, chiefly due to the implementation of vegetation manipulations. Economic benefits would be highest under this alternative. The most beneficial impacts to wetlands, riparian areas and fish habitat would occur under Alternatives 2 and 5. Antelope habitat would improve most under the proposed action and Alternatives 3 and 5. Wild horse populations would benefit most by implementation of Alternative 4.

COMPONENTS OF THE PROPOSED ACTION AND ALTERNATIVES

The proposed grazing management is composed of three elements which are interdependent. For purposes of analysis, they are described separately below and in the Environmental Consequences section.

Vegetation Allocation

The vegetation allocation proposed for each alternative would allocate the existing and anticipated livestock forage production to various uses including wildlife, wild horses, livestock and nonconsumptive uses. The allocation under the proposed action is designed to provide sufficient forage to maintain wild horse populations at the herd management plan levels, meet ODFW wildlife population objectives and make available increased amounts of forage for livestock. Appendix C describes the methodology used in determining the proposed allocations. Appendix B, Table B-1, shows the proposed action initial allocation. The allocations for the alternatives are designed to optimize different uses under each alternative. By implementing grazing management and range improvements, it is anticipated that the existing level of forage production would increase. Appendix B, Table B-4 shows the anticipated long-term vegetation allocation 10 years following implementation of the proposed action or alternatives.

Grazing Systems

A grazing system consists of one or more planned grazing treatments which use livestock grazing to bring about changes in the kind and amount of vegetation. These changes are determined by measuring vigor, reproduction and composition of key species. Key species are those plants which serve as indicators of changes occurring in the vegetation communities. Grazing systems which allow plants to complete the growth stages (see Table 1-6) generally result in increases in key species. An improvement in range condition is normally due to an increase of the key species and conversely, a deterioration of range condition is normally the result of a decrease in the key species.

Table 1-5 Summary Comparison of Long-Term Impacts of the Proposed Action and Alternatives

Significant Resource	Existing Situation	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Soils							
Erosion	---	+L	-L	+M	+L	+L	+L
Streambank erosion (miles improving)	---	93.0	71.1	102.2	85.8	93.0	100.6
Water							
Runoff	---	NC	NC	-L	NC	NC	NC
Fecal coliforms	---	+L	-L	+M	+L	+L	+M
Sediment yield	---	+L	-L	+M	+L	+L	+L
Vegetation							
Range condition (3,204,182 acres total)							
Good	18%	65%	24%	63%	78%	58%	65%
Fair	56%	17%	29%	11%	14%	25%	15%
Poor	23%	15%	44%	23%	5%	18%	17%
Unknown	3%	3%	3%	3%	3%	3%	3%
Residual ground cover	---	+L	-L	+H	+L	+L	+M
Forage production (AUMs)	183,187	248,022	183,187	183,187	384,621	231,217	248,011
Riparian	---	+M	+L	+H	+M	+M	+H
Wildlife Habitat Conditions							
Deer (305,000 crucial acres)							
Up	23%	26%	5%	4%	8%	26%	29%
Static	0%	65%	85%	16%	33%	65%	62%
Down	0%	6%	7%	77%	56%	6%	6%
Unknown	77%	3%	3%	3%	3%	3%	3%
Antelope (96,700 crucial acres)							
Up	---	81%	7%	0%	81%	35%	81%
Static	---	13%	87%	0%	13%	13%	13%
Down	---	6%	6%	53%	6%	52%	6%
Unknown	100%	0%	0%	46%	0%	0%	0%
Bighorn sheep	---	NC	NC	NC	NC	NC	NC
Wetlands (12,696 acres)							
Up	---	68%	6%	87%	63%	68%	74%
Static	---	17%	73%	4%	17%	17%	11%
Down	---	0%	0%	0%	0%	0%	0%
Unknown	100%	15%	21%	9%	20%	15%	15%
Riparian areas (621 acres)							
Excellent	0%	0%	0%	1%	0%	0%	1%
Good	5%	38%	17%	96%	17%	38%	90%
Fair	26%	30%	36%	2%	36%	30%	5%
Poor	19%	13%	18%	0%	18%	13%	0%
Unknown	50%	19%	29%	1%	29%	19%	4%
Fish (65 stream miles)							
Excellent	5%	9%	5%	9%	9%	9%	9%
Good	19%	31%	25%	48%	21%	31%	45%
Fair	25%	24%	23%	19%	23%	24%	18%
Poor	29%	16%	20%	9%	19%	16%	12%
Unknown	22%	20%	27%	15%	28%	20%	16%

Table 1-5 Summary Comparison of Long-Term Impacts of the Proposed Action and Alternatives

Significant Resource	Existing Situation	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Wildlife Populations							
Deer	---	NC	NC	NC	NC	NC	NC
Antelope	---	+L	NC	NC	+L	NC	+L
Small mammals	---	-L	NC	+M	-H	-L	-L
Upland game birds	---	+L	NC	+L	-M	+L	+L
Other birds	---	-L	NC	+M	-H	-L	-L
Reptiles	---	-L	NC	+M	-H	-L	-L
Amphibians	---	+L	NC	+M	+L	+L	+M
Wild Horses (Numbers)	495	360	360	360	60	2,100	60
Recreation							
BLM Visitor Use - 1990 (visitor-days/year)	72,285	80,130	80,237	85,320	72,750	80,010	80,530
Cultural Resources							
Trampling and setting integrity	---	-L	-L	+L	-M	-L	-L
Visual Resources (Contrast)	---	-L	NC	+L	-M	-L	-L
Areas of Critical Environmental Concern	---	NC	NC	NC	-M	NC	NC
Special Areas							
Degradation	---	-L	NC	NC	-M	-L	-L
Energy Use							
Trillion Btu's consumed for new project construction	---	1.13	0	0	3.85	.88	1.34
Socioeconomics 1/							
Operators losing more than 10% of forage needs	---	1	0	67	0	3	2
Local personal income: ($1000)							
Livestock production	19,900	+581	0	-1,195	+1,617	+212	+390
Recreation	---	+7	0	+48	-67	+4	+12

Note: NC = no change + = beneficial - = adverse L = low M = medium H = high

1/ Socioeconomic impacts are shown as changes from the existing situation. Personal income (at annual rates) is in thousands of 1977-79 dollars.

Table 1-6 Approximate Growth Stage Dates for Key Species

Species 1/	Start of Growth	Peak of Flowering	Seed Ripe	Dormancy
Bluebunch wheatgrass	3/20	6/15	7/20	9/1
Basin wildrye	4/1	7/1	8/1	9/15
Idaho fescue	3/15	6/10	7/15	8/15
Crested wheatgrass 2/ 3/	3/1	6/10	7/20	8/15
Squirreltail	3/10	6/10	7/10	8/1
Thurber's needlegrass	3/20	6/15	7/15	9/1
Sandberg bluegrass 3/	3/1	5/15	7/1	7/15
Bitterbrush 4/	4/15	6/1	7/1	10/1
Spiny hopsage 4/	4/1	6/1	7/15	9/1
Currant 5/	4/15	5/20	7/15	9/15
Willow 5/	3/1	4/15	6/22	10/15
Chokecherry 5/	4/15	6/1	8/15	9/15
Quaking aspen 5/	5/1	N/A	N/A	10/1
Creek dogwood 5/	4/15	6/10	7/1	9/1
Kentucky bluegrass 5/	5/1	8/1	9/1	10/1
Timothy 5/	5/1	8/1	9/1	10/1
Bulrush 5/	5/1	8/1	8/15	9/1
Sedge 5/	5/1	8/1	8/15	9/1

1/ Scientific names for the plants listed are shown in Appendix D.
2/ Key species for seeded areas.
3/ Key species for deer and antelope spring range.
4/ Key species for deer winter range.
5/ Key species for riparian areas.

Although each of the following descriptions outlines the typical period of grazing use and degree of utilization, there is some variation among the different allotments. Figure 1-3 shows examples of the proposed systems with sequence of treatments.

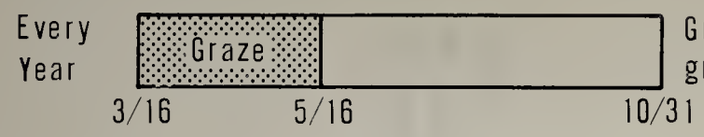
Spring Grazing

Spring grazing would occur each year for 1 to 2 months between March 1 and May 15, depending upon the elevation. Utilization of the production of key species during the scheduled period of grazing would not exceed 50 percent.

Spring grazing is proposed for one or more of the following reasons:

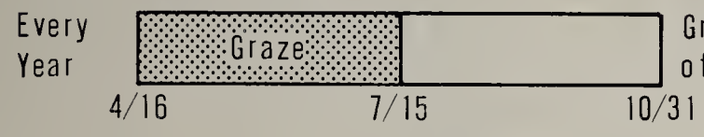
- The system meets the operator's management needs.
- Better livestock distribution occurs since the cool temperatures result in less water requirement.
- Best advantage is made of early season (non-lasting) water sources.
- Livestock are removed early enough for regrowth of the key species to occur.

SPRING GRAZING:



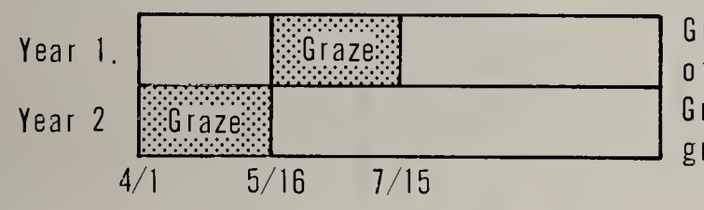
Graze early during the growing period

SPRING/SUMMER GRAZING:



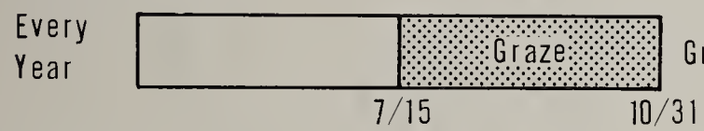
Graze during the critical part of the growing period

ROTATION GRAZING:



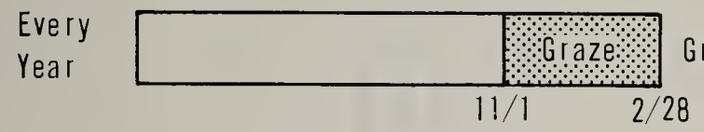
Graze during the critical part of the growing period
Graze early during the growing period

DEFERRED GRAZING:



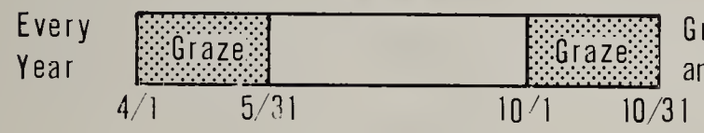
Graze after seedripe

WINTER GRAZING:



Graze during dormancy

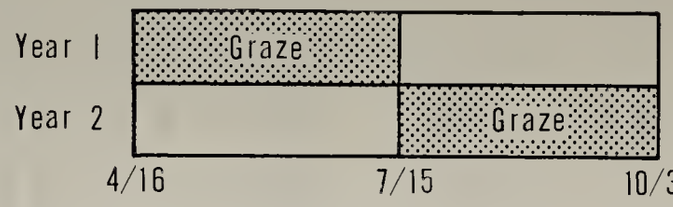
SPRING/FALL GRAZING:



Graze early during growing period and again in late fall

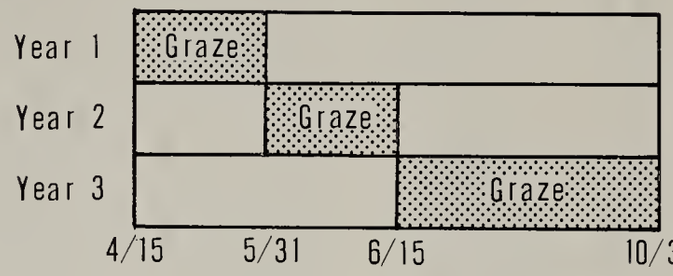
DEFERRED ROTATION:

1. Two Pasture System



Graze early
Graze after seedripe

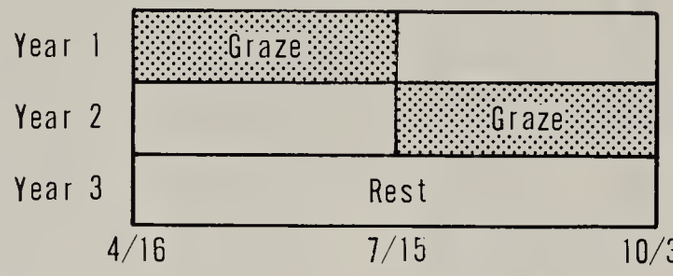
2. Three Pasture System



Graze early during the growing period
Graze later during the growing period
Graze after seedripe

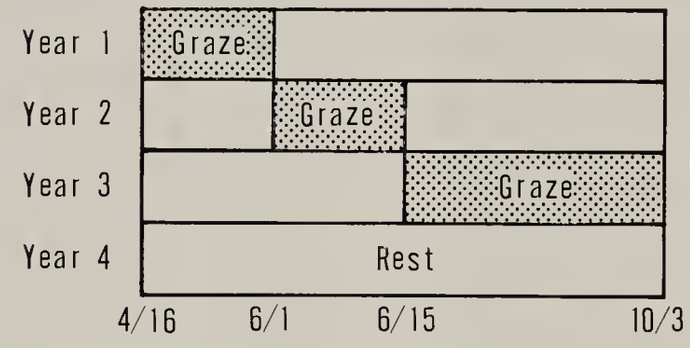
REST ROTATION:

1. Three Pasture System



Graze during the growing period
Graze after seedripe
Rest the entire year

2. Four Pasture System



Graze early during the growing period
Graze later during the growing period
Graze after seedripe of the key species
Rest the entire year

FIGURE 1-3 - EXAMPLES OF TYPICAL GRAZING SYSTEMS - SEQUENCE OF TREATMENT BY PASTURE

Spring/Summer Grazing

Spring/summer use consists of grazing during the spring and early summer every year, with use in some allotments occurring into fall. Utilization of the annual forage production of key species would not exceed 50 percent. Spring/summer grazing is proposed for one or more of the following reasons:

- The limited amount of public land in many of these allotments does not justify the cost of the additional fences and water developments needed to initiate a rotation system.
- This system meets the operator's management needs.
- Reliable stock water during the grazing use period would be assured.
- Natural barriers and different turn out locations allow some deferment.

Rotation Grazing

Rotation grazing results in the key species being grazed 1 to 2 months during the critical part of the growing season, alternating with spring grazing the following year. Utilization of the annual forage production of key species would not exceed 50 percent. Rotation grazing is proposed for one or more of the following reasons:

- Best advantage is made of early season (non-lasting) water sources.
- Advantage is taken of the early green growth, resulting in best use of the annual vegetation.
- Allows use of natural barriers (rims) and existing pasture layout.

Deferred Grazing

Deferred grazing would begin each year after seed ripening of key species (see Table 1-6). The deferment or delay of grazing occurs on the same area each year and would not be rotated because only one pasture would be involved. Utilization of the annual forage production of key species would not exceed 60 percent. Deferred grazing is proposed for one or more of the following reasons:

- Allows for a high level of restoration of plant vigor and seed production.
- Maintains or improves existing range condition.
- Accomplishes effective litter and seed trampling.
- Limited resource values do not justify cost of improvements necessary for a more intensive system.

Winter Grazing

Winter grazing is a form of deferred grazing in which use occurs in the winter months, after plant dormancy, usually from November to February. Utilization of the key species would not exceed 65 percent. Winter grazing is proposed for one or more of the following reasons:

- The system meets the operator's management needs.
- Lower livestock water requirements allow better livestock distribution.
- Livestock accomplish effective litter and seed trampling.
- Allows for maximum restoration of plant vigor and seed production.
- Limited resource values do not justify the cost of major range improvements necessary for a more intensive system.

Spring/Fall Grazing

Spring/fall grazing involves use for 1 to 2 months between March 1 and May 30, a rest period during the summer, and another grazing period of 1 to 2 months in the fall every year. Utilization of the key species would not exceed 50 percent. Spring/fall grazing is proposed for one or both of the following reasons:

- The system meets the operator's management needs.
- The system facilitates cooperative management with the U.S. Forest Service.

Deferred Rotation Grazing

Deferred rotation is the discontinuance of grazing on various parts of an allotment in succeeding years. This allows each part or pasture to rest successively during the growing season. One or more pastures would be grazed during the spring, while the remaining one or more pastures would be rested until seed ripening of key species and then grazed. Deferred rotation grazing differs from rest rotation grazing in that there is no year-long rest provided for any part of the allotment.

Utilization of the key species on an allotment basis would not exceed 50 percent of the available forage annually. On crested wheatgrass seedings, utilization of up to 60 percent of the available forage would be allowed. Deferred rotation grazing is proposed for one or more of the following reasons:

- The deferred rotation system is expected to maintain or improve the present range condition.
- The system allows for improved grazing management on some small pastures.

Rest Rotation Grazing

Rest rotation grazing is a rotation system in which at least one pasture within an allotment is rested from grazing for a minimum of a full year. A pasture or unit of range is rested from use after a season of grazing to allow plants an opportunity to make and store food to recover vigor, allow seed to be produced, allow seedlings to become established and allow litter to accumulate between plants. The amount of rest needed for these purposes depends on management objectives that are determined for each individual allotment, the plants involved and character of the range.

Utilization of the key species in the grazed pastures would not exceed 60 percent. Rest rotation is proposed for one or more of the following reasons:

- A substantial improvement and/or maintenance in range condition is desired.
- More flexibility in grazing use during variable climate conditions is possible.
- Vegetation manipulation projects can be carried out within pastures without additional control or major changes in grazing plans.
- Desirable plant growth forms and vegetation production is available for certain wildlife species.
- A substantial portion of the range is rested from livestock grazing each year and is thus available for other uses.

Federal Range Fenced

Federal Range Fenced (FRF) consists of small tracts of public land fenced into pastures usually with large amounts of private land. These tracts are usually licensed for the grazing capacity of the public lands only. Livestock numbers, kind of animals and period of use are most often not restricted. However, actual grazing use is usually after the growing season since the use is in conjuction with private land (often crop lands).

Non-Use

Non-use presently occurs in part or all of six allotments. The livestock operators have taken authorized non-use for several years in these areas. Non-use is proposed for the Abert Rim pasture of Allotment 400, which is presently under winter grazing. Grazing use would be phased out as AUMs become available elsewhere in the allotment. Grazing could occur if application were made in the future. Trailing use would occur in the spring and/or fall.

Standard Procedures and Design Elements for Range Improvements

The following standard procedures and design elements would be adhered to in constructing range improvements in the EIS area. Design elements have been standardized over time to mitigate adverse effects encountered during range improvement installations.

- Whenever evidence of historic or prehistoric occupation is identified during BLM activities, cultural resource surveys would be undertaken to determine possible conflicts in management objectives. Further, these surveys ensure that cultural resources on public lands and on lands affected by Bureau undertakings are properly inventoried and evaluated.

  A Class III intensive cultural resources inventory would be completed on all areas prior to any ground-disturbing activities. This would be part of the preplanning stage of a project and the results would be analyzed in the environmental assessment addressing the action (BLM Manual 8100, Cultural Resources Management). If significant cultural remains are discovered, the project could be relocated, redesigned or abandoned. If the project cannot be moved, a data recovery or salvage program would be completed before construction.

Every effort would be made to avoid adverse impacts to cultural resources. However, where that is not possible the BLM would consult with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation in accordance with the Programmatic Memorandum of Agreement (PMOA) by and between the Bureau, the Council and the National Conference of State Historic Preservation Officers, dated January 14, 1980, which sets forth a procedure for developing appropriate mitigative measures. This PMOA identifies procedures for compliance with Section 106 of the National Historic Preservation Act (1966) and Executive Order 11593, as implemented by 36 CFR Part 800.

- Prior to vegetative manipulation and development of range improvements, BLM requires a survey of the project site for plants and animals listed or under review for listing on Federal or offical State lists of threatened and endangered species. If a project might affect any such species or its critical habitat, every effort would be made to modify, relocate or abandon the project in order to obtain a no effect determination. Consultation with the U.S. Fish and Wildlife Service would be initiated (50 CFR 402; Endangered Species Act of 1973, as amended) for plants under review for Federal listing when BLM determines that such a project cannot be altered or amended. In addition, 13 plants in the Lakeview EIS area classified by BLM as sensitive (Crosby 1980) are managed under the same procedures as plants under review for Federal listing except that no consultations with the U.S. Fish and Wildlife Service would occur.

- The wilderness inventory required by Section 603(a) of the Federal Land Policy and Management Act (FLPMA) has been completed on the public lands in the EIS area. Impacts would be assessed before allowing rangeland management activities in Wilderness Study Areas (see Glossary). All rangeland management activities in Wilderness Study Areas would be consistent with the Interim Management Policy and Guidelines for Lands Under Wilderness Review (USDI, BLM 1979a).

- Surface disturbance at all project sites would be held to a minimum. Disturbed soil would be rehabilitated to blend into the surrounding soil surface and reseeded as needed with a mixture of grasses, forbs and browse as applicable to replace ground cover and reduce soil loss from wind and water erosion.

- All State of Oregon water-well drilling regulations would be adhered to, in both drilling and equipping.

- Significant spring sources and associated trough overflow areas would be fenced to prevent livestock grazing.

- Ramps, rocks or floatboards would be provided in all water troughs for small birds and mammals to gain access to the water and/or escape.

- Proposed fence lines would not be bladed or scraped, unless physical features (such as a cut bank) would make it absolutely necessary.

- Proposed fences in antelope areas would be constructed in accordance with Bureau Manual 1737. Any proposed deviations from this manual would be coordinated with Oregon Department of Fish and Wildlife. All other fences would be constructed in accordance with Bureau standard wire livestock fences Drawings No. 08-33-9105.4 - 1, 2, 3, 10 and 0-01-9105-1, 3, 11, 12 and 13.

- Gates or cattle guards would be installed where fences cross existing roads with significant use.

- Juniper control would consist of chaining, burning or falling juniper trees. The cut and/or chained trees would be left in place and made available for public use on a request basis.

- Most vegetation manipulation projects would be designed using irregular patterns, untreated patches, etc., to provide for optimum edge effect for wildlife.

- Important wildlife habitat would be excluded from vegetation manipulation projects unless treatment would provide direct wildlife enhancement.

- Brush control would be by burning, chaining or chemical means. Burning would use one or more of the following types of fire breaks: natural barriers, retardant lines, existing roads and/or bladed lines. Each fire would have its own prescription, to be based on the conditions needed (wind speed, air temperature, etc.) to burn the plant material within the area to be burned. Chaining would consist of dragging either an anchor chain or an anchor chain with sections of railroad rail welded across each link between two tractors. The chemical applied would be 2,4-D (low volatile formulation) using a water carrier at a rate of 2 pounds active ingredients per acre on sagebrush and 3 pounds active ingredients per acre on rabbitbrush. To minimize drift and volatilization, aerial spraying would be confined to periods when wind speed is less than 6 miles per hour, air temperature is under 70 degrees, relative humidity is over 50 percent, precipitation is not occurring or imminent and air turbulence will not affect normal spray patterns. Either fixed-wing aircraft or helicopters would be used for all spraying. A protective buffer strip at least 100 feet wide on both sides of all live streams (those flowing water at the time of application) and around water sources would be required. In the design of each spray project, any crucial riparian or wildlife habitat would be identified by district personnel and such areas would be excluded from the project. If spraying is to be undertaken adjacent to private lands containing cropland, pasture or dwellings, a buffer strip at least 100 feet wide would be required. Flight patterns would be adjusted for wind, topography or any factor which could cause the herbicide to drift within the 100-foot buffer strip. Any application of 2,4-D would be in accordance with State regulations and BLM Manual 9220. A more thorough description of design features applicable to the proposal may be found in BLM's final environmental impact statement, Vegetative Management with Herbicides-- Western Oregon. Design features are also applicable in eastern Oregon.

- Seeding would be accomplished by use of the rangeland drill in most cases. Broadcast seeding would occur on small disturbed areas, rough terrain and rocky areas. Preparation for seeding would be by burning, chaining or chemical means (2,4-D). BLM would determine seeding mixtures on a site specific basis, using past experience and recommendations of the Oregon State Extension Service and Experiment Stations and/or Oregon Department of Fish and Wildlife (ODF&W). Some shrubs and/or trees would be planted in 24 allotments for wildlife cover (see Appendix B, Table B-3). Anticipated increases in production through vegetative manipulation projects would not be allocated until seedings are established and ready for use. All seedings would be deferred from grazing to allow seedling establishment. Usually this will require two full growing seasons.

- It is anticipated that the existing road and trail system would provide access for range improvement construction. Cross-country use of motor vehicles to reach construction sites could create unimproved trails and tracks. These trails could continue to be utilized to allow maintenance of the projects.

- Normal maintenance such as replacement of pipeline sections, fence posts and retreatment of vegetation manipulations would be required. Most major maintenance of range improvements would be the responsibility of BLM, except for livestock management fences, which would be maintained by the operator.

IMPLEMENTATION OF THE DECISION

The District Manager will begin to develop the proposed decision after the final EIS is published. The proposed decision may be to select one of the EIS alternatives (including the proposed action) intact, or to blend features from several alternatives that fall within the range of actions analyzed in the EIS.

After release of the final EIS (but not before conclusion of the 30-day comment period) the District Manager will review the public comments on both draft and final EISs and prepare a draft of the Rangeland Program Summary (RPS) which includes a recommended decision. In addition, the District Manager and/or State Director will consult with the District Multiple Use Advisory Council, local county commissioners, appropriate county associations and the Governor's Natural Resources Assistant. As part of the local consultation, the District Manager will seek assurance that the decision being considered is consistent with county comprehensive plans.

Within about 4 months after the release of the final EIS, and after making any needed modifications, the District Manager will distribute the Draft Rangeland Program Summary to interested parties (including A-95 Clearinghouse) for public comment. A 45-day comment period will be provided and one or more public meetings held.

After the comment period closes, the District Manager will submit a revised (if appropriate) proposed decision to the State Director for concurrence or modification.

This will be the decision point. The final decision will be published in a final Rangeland Program Summary and will consider all information available at that time including public opinion, management feasibility, policy and legal constraints as well as the EIS analysis.

This program summary will incorporate the record of decision required by the Council on Environmental Quality regulations. This document should be released approximately 6 to 7 months after issuance of the final EIS.

After announcement of the final program decision, allotment management plans will be developed through consultation and coordination with the operators. Decisions of vegetation allocation to individual operators would be effective starting with the second full grazing season after the EIS becomes final. Proposed reductions over 15 percent may be phased over a 5-year period as provided in 43 CFR 4110.3-2(c).

Implementation of grazing systems would occur first on those allotments where most of the needed range improvements have been completed. Grazing systems would be implemented on the remaining allotments as needed range improvements are completed. First priority for completion of range improvements would be given those that solve immediate resource problems and/or result in high multiple use values. Second priority would be those allotments which have had past major reductions and/or are proposed for major reductions in livestock grazing.

Further Environmental Assessment Requirements

Standard procedures require preparation of a site specific environmental assessment prior to implementation of range improvements. Similar actions may be grouped into one assessment. Each analysis would reference applicable portions of this EIS. Proposed range improvements may be modified or abandoned if this assessment indicates a conflict.

Monitoring and Management Adjustments

A monitoring program would be developed to assure that resource objectives were being met. Studies would be conducted in all allotments which would have AMPs and in some other allotments where warranted by resource values. Water quality monitoring would be initiated in accordance with Executive Orders 11991 and 12088, BLM Manual 7240, and Sections 208 and 313 of the Clean Water Act (P.L. 95-217, P.L. 92-500 as amended). Standard analytical methods as detailed in Federal directives would be followed.

Studies would be established in representative riparian zones to determine changes in the habitat conditions and populations of fish and wildlife resulting from implementation of the proposed action. Such monitoring would comply with Executive Orders 11514 and 11990 and BLM Manual 6740.

Existing browse studies would be continued. Wildlife habitat and populations would be monitored to determine the effectiveness of design features for vegetation manipulation and grazing systems.

Other resource studies as appropriate would also be conducted. Climate, actual use, utilization and trend studies would be conducted in accordance with BLM Manuals 4412 and 4413 to evaluate vegetation changes. Results of these studies would be summarized and evaluated at the end of each grazing system cycle. The data would then be used to assess progress toward achieving AMP objectives and to recommend adjustments in the grazing system or stocking rate.

If an evaluation supports an increase in livestock grazing use, the additional use would first be granted on a temporary basis. An evaluation of forage production must confirm the availability of additional forage before an increase in use would become permanent. Grazing management would be revised if the evaluation determines that the specific objectives established for the allotments are not being achieved. Other revisions may include changes in amount of livestock use permitted, period of use, or any combination of these.

Each operator would be issued term permits which specify allotment, period of use, and numbers and kind of livestock. Livestock grazing use would be supervised throughout the year. If unauthorized use should occur, action would be taken by BLM to eliminate it in accordance with regulations in 43 CFR 4150.

INTERRELATIONSHIPS

BLM Planning

The BLM planning system is essentially a decisionmaking process utilizing input from the public and data about the various resources. Land use objectives and rationale for each resource category are developed and incorporated into the proposed Management Framework Plans (MFP). Specific MFP recommendations relating to the grazing program were used as a basis for developing the proposed action and Alternatives 3, 4 and 5. The proposed MFPs are available for review in the Lakeview District Office.

Federal Agencies

Grazing on lands administered by other Federal agencies is not contingent on grazing on BLM-administered lands. However, each portion is an integral part of the ranchers total operation. In the EIS area, 43 BLM operators also have grazing permits on the Fremont, Deschutes, Modoc and/or Winema National Forests. In addition to agencies which manage grazing on Federal lands, the Soil Conservation Service (SCS) develops plans for private ranches. Coordinated planning among the concerned Federal agencies and ranchers assures that resource conflicts are resolved and management goals are met.

State and Local Governments

The Intergovernmental Relations Division for the State of Oregon acts as a clearinghouse for the various State agencies. All BLM planning and major actions are coordinated through this State Clearinghouse. Planning is also coordinated with the county commissioners and/or the county planning commissions.

Under Oregon Senate Bill 100, all counties and cities in Oregon are required to develop and adopt comprehensive plans and land use controls consistent with statewide planning goals and guidelines developed by the Land Conservation and Development Commission (LCDC). Lake and Harney Counties have adopted comprehensive plans and Klamath County is presently developing a plan. The adopted plans are presently in review status by LCDC for compliance with Statewide goals. LCDC has required revisions to the plans and deferred acknowledgement until they are brought into compliance. The relationship of the proposed action and alternatives to LCDC goals is displayed in Table 1-7. The proposed action and all the alternatives except Alternative 2 are consistent with the adopted comprehensive plans and LCDC goals.

Table 1-7 Relationship of The Proposed Action and Alternatives to LCDC Goals [1]

LCDC Statewide Goal Number and Description	Discussion [2]
1. To insure citizen involvement in all phases of the planning process.	BLM's land-use planning is a process providing for public input at various stages. Public input was specifically requested in developing the proposed grazing management program and alternatives described in this EIS. Public input will continue to be utilized in the environmental process and final decision.
2. To establish a land use process and policy framework as a basis for all decisions and actions.	The proposed action and all alternatives have been developed in accord with the land use planning process authorized by the Federal Land Policy and Management Act of 1976 which provides a policy framework for all decisions and actions.
5. To conserve open space and protect natural and scenic resources.	The Bureau planning system considered natural and scenic resources in development of the proposed grazing management programs and alternatives. Fencing and vegetation manipulation projects in the proposed action and Alternatives 3, 4 and 5 would impact open space and natural and scenic resources.
6. To maintain and improve the quality of the air, water and land resources.	Water quality would be maintained or improved under the proposed action and all alternatives. Proposed burning for brush control in the proposed action and Alternatives 3, 4 and 5 would temporarily affect air quality.
8. To satisfy the recreational needs of the citizens of the State and visitors.	The BLM actively coordinates its outdoor recreation and land use planning efforts with those of other agencies to establish integrated mananagement objectives on a regional basis. Under the proposed action and all alternatives, opportunities would be provided to meet recreational needs.
9. To diversify and improve the economy of the State.	Short term economic losses would occur under the proposed action and Alternative 3 due to reductions in livestock use. Economic gains would occur in the long term due to increased forage production, resulting in improved local economy. Alternative 2 would result in an adverse impact to local economic conditions.
13. To conserve energy.	Conservation and efficient use of energy sources are objectives in all BLM activities. Because range improvements construction is energy intensive, Alternative 3 utilizes the most energy.

1/ Goals 3, 4, 7, 10, 11, 12 and 14 are not generally applicable to the proposed action or alternatives.

2/ See Chapter 3 for impacts of the proposed action and alternatives on the various resources.

CHAPTER 2

AFFECTED ENVIRONMENT

CHAPTER 2 AFFECTED ENVIRONMENT

INTRODUCTION

This section describes the resources within the Lakeview EIS area as they existed in 1979 (base year). The base year of 1979 was chosen because the primary data sources (Bureau planning system documents) were compiled during that year. The planning system documents consisting of Unit Resource Analysis, Planning Area Analysis and Management Framework Plans are available for review in the Lakeview District Office in Lakeview, Oregon.

Emphasis has been placed on those resource components most likely to be impacted if the proposed action or one of the alternatives were implemented. Analysis, including the scoping process, indicated that resource components such as minerals, timber and air quality would not be affected and, therefore, they are not discussed. Other information is included only to the extent necessary to provide a basis for analysis.

VEGETATION

The Lakeview EIS area has 18 distinct vegetation types. These have been grouped into major vegetation types as shown on Figure 2-1 and Table 2-1. Big sagebrush and low sagebrush are the dominant vegetation types, covering nearly 73 percent of the EIS area. The wetland vegetation type is intermingled with the silver sagebrush, big sagebrush and greasewood types. As the result of mapping done during the range survey of 1958-1963, the meadow type as shown on Figure 2-1 does not display all of the riparian and wetland types. The most recent and detailed mapping of wetland and riparian vegetation is shown in Figure 2-2. All further discussion of these types is contained in sections on wetland and riparian vegetation types.

Condition and Trend

Range condition, as the term is used in this document, is a relative measure of the condition of the forage stand and the soil. Range condition was determined for the EIS area in 1978 and spot checked in 1979 using the Deming Two-Phase survey method (see Appendix E for a discussion of the methodology). The condition rating considers site potential in judging the relative health of the plant community, but the emphasis placed on forage species by the rating system results in poor condition ratings for areas of low forage production potential such as greasewood flats or rocky slopes. Table 2-2 shows range condition and trend for the EIS area; Appendix F shows range condition and trend by allotment.

Range trend is a measure of whether the range condition is improving, remaining static or deteriorating. The range trend data shown in Table 2-2 and Appendix D are based on a comparison of the data collected in 1978 and 1979 with the data collected in the late 1950's and early 1960's in the same area.

Table 2-1 Vegetation Types in the EIS Area

Vegetation Type	Public Land Acres 1/	Percent of Total	Common Plant Species 2/	Remarks
Big Sagebrush	1,731,147	54.0	Big sagebrush, bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, squirreltail, cheatgrass, needlegrass, phlox, aster	Occurs on soils over 12 inches deep. Bluebunch wheatgrass is most commonly on the drier sites and Idaho fescue on the moister.
Low Sagebrush	604,950	18.9	Low sagebrush, Sandberg bluegrass, squirreltail, bluebunch wheatgrass, Junegrass, needlegrass, phlox, buckwheat	Occurs on shallow clay soils. A variety of understory species also occur.
Juniper	245,761	7.7	Juniper, Idaho fescue, squirreltail, cheatgrass, low sagebrush, big sagebrush, bluebunch wheatgrass, phlox, buckwheat	Occurs on shallow rocky soils. The understory vegetation is generally sparce.
Greasewood	185,843	5.8	Greasewood, saltgrass, squirreltail, creeping wildrye	Occurs on saline soils in lowland areas. The understory vegetation is sparce.
Seeding	154,762	4.8	Crested wheatgrass, intermediate wheatgrass, cheatgrass	Occurs on areas formerly dominated by big sagebrush or low sagebrush which were seeded.
Rabbitbrush	78,502	2.4	Rabbitbrush, creeping wildrye, saltgrass, cheatgrass	Occurs on sandy soils formerly dominated by big sagebrush and then farmed. When farming was abandoned, rabbitbrush invaded the disturbed areas.
Shadscale	71,133	2.2	Shadscale, hopsage, squirreltail, cheatgrass	Occurs on saline soils in lowland areas. The understory vegetation is very sparce.
Mt. Shrub/Conifer	53,510	1.7	Ponderosa pine, bitterbrush, ceanothus, manzanita, mountain mahogany, Idaho fescue, neddlegrass, bluebunch wheatgrass, yarrow	Occurs in the higher elevations in the EIS area which receive higher precipitation. Includes the Lost Forest, a mature stand of ponderosa pine outside of its normal range.
Silver Sagebrush	22,750	0.7	Silver sagebrush, saltgrass, poverty weed, dock, knotweed	Occurs on playa lakebeds which are covered with water in the spring.
Wetland	12,696	0.4	Rushes, spikerushes, mat muhly, smartweed	Intermittently flooded areas intermingled with silver sagebrush, greasewood and big sagebrush. Includes some of the areas labeled meadow in Figure 2-1.
Riparian	694	<0.1	Quaking aspen, sedge, rush, Kentucky bluegrass, creeping wildrye, willow	Vegetation is associated with permanent water. Occurs as wet meadows or streamside riparian vegetation.
Miscellaneous	42,434	1.3	Cheatgrass, various forbs	Includes lava flows, rock, sand dunes, saline flats, cheatgrass, dry lakebeds, annual forbs, cropland and barren and unsurveyed lands.
Total	3,204,182			

1/ Acreage shown does not include unallotted acres.

2/ Scientific names for the plants listed are in Appendix D.

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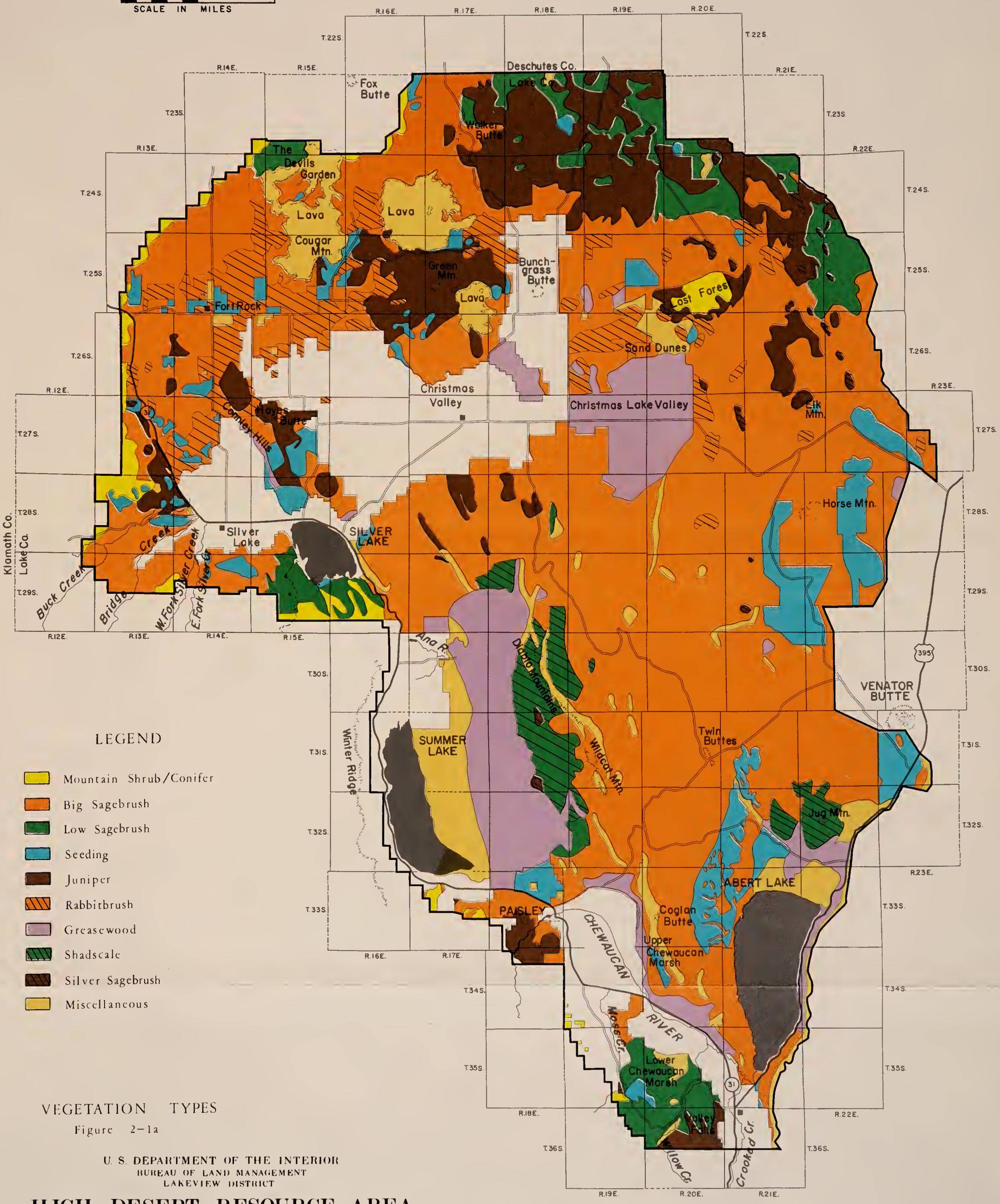
SCALE IN MILES



LEGEND

- Mountain Shrub/Conifer
- Big Sagebrush
- Low Sagebrush
- Seeding
- Juniper
- Rabbitbrush
- Greasewood
- Shadscale
- Silver Sagebrush
- Miscellaneous

VEGETATION TYPES

Figure 2–1a

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

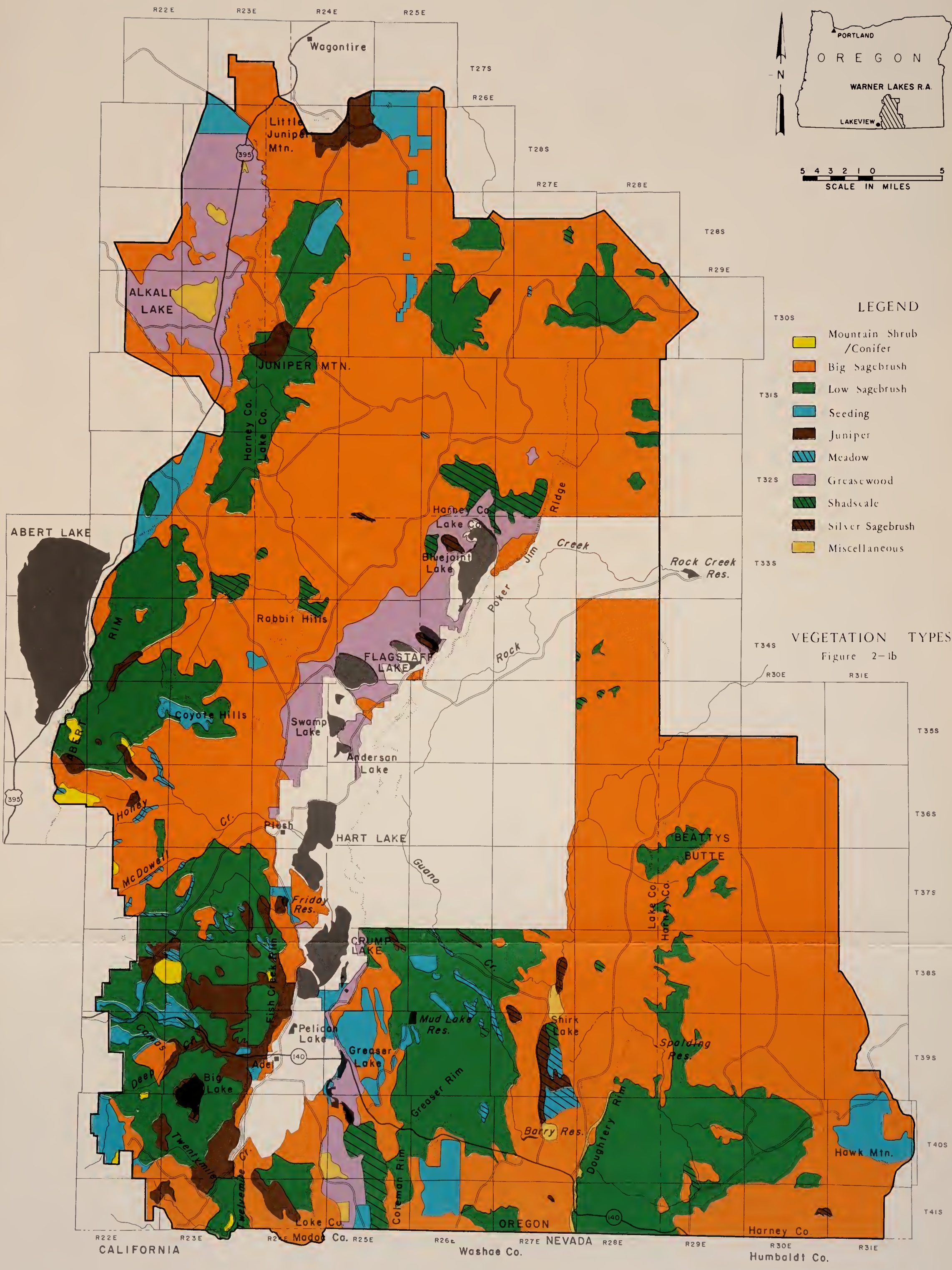
HIGH DESERT RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

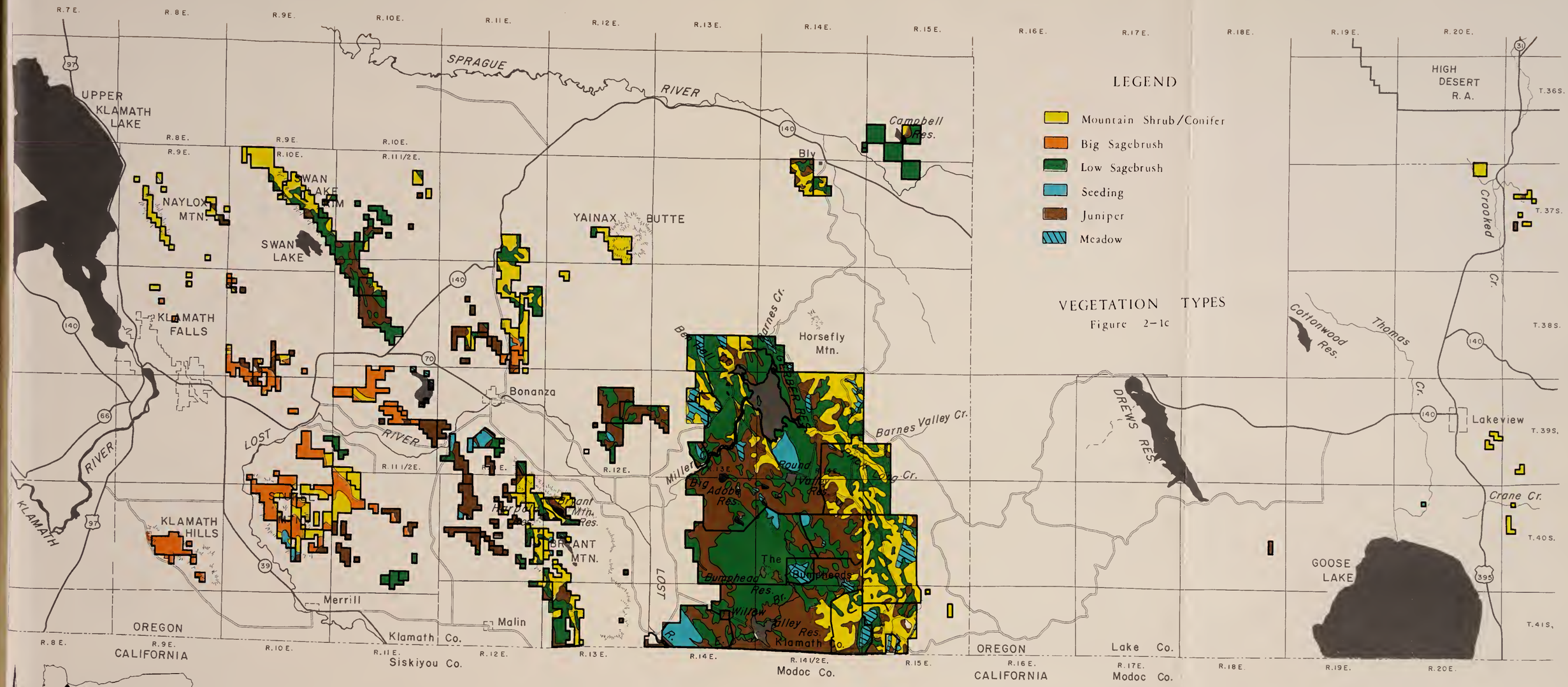
U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

WARNER LAKES RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981



VEGETATION TYPES
Figure 2–1b



VEGETATION TYPES

Figure 2-1c

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

LOST RIVER RESOURCE AREA

Lakeview Grazing Management

Environmental Impact Statement

1981

The data in Appendix F represent the average range condition and trend of each allotment. However, within most allotments there are small areas which are not average. For example, in an allotment with 2,000 acres listed in fair condition and static trend, there would likely be small areas in poor condition and downward trend near water sources. Conversely, other areas located away from grazing pressure would likely be in good condition with an upward trend.

Table 2-2 Range Condition and Trend

Condition

Good		Fair		Poor		Unknown	
Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
596,154	19	1,773,713	55	738,970	23	95,345	3

Trend

Upward		Static		Downward		Unknown	
Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
1,533,458	48	1,416,306	44	116,782	4	137,636	4

Forage Production

That portion of the total vegetation production suitable for use by livestock is called forage production. Forage production for each allotment is shown on Table 1-2. The methodology used for determining the forage production is described in Appendix C. Within the EIS area, forage production is typically 30 percent or less of the total vegetation production. The remaining vegetation includes plants which are not palatable to livestock and that portion of the vegetation production which is reserved for plant maintenance. Forage production is dependent upon climate, soils and range condition. Large year-to-year fluctuations in precipitation result in corresponding differences in total vegetation production. Production is low on certain soils such as the very shallow and very stony soils due to low moisture holding capacity.

Residual Ground Cover

Residual ground cover expresses the amount of live vegetation, standing dead vegetation and litter which remains after grazing. Over time, the accumulation of this material provides protection for the soil surface and replaces soil nutrients. There is some decrease in live vegetative cover as range condition declines in each vegetation type, but generally, as range condition changes, one plant replaces another. However, areas in good range condition often have higher production than fair or poor condition range and as a result have more total residual ground cover.

Riparian Vegetation

Riparian vegetation occupies approximately 694 acres of public land. It consists of the vegetation on riparian areas adjacent to perennial streams and springs. Vegetation around lakes and reservoirs and on other areas where soils are saturated throughout most of the growing period are classified as wetlands. The location of significant riparian areas and wetlands on public lands is shown on Figure 2-2.

The riparian areas and wetlands are potentially the most productive of the vegetation types in the EIS area. When relatively undisturbed, riparian vegetation is generally composed of thick clusters of shrubs and trees interspersed with dense herbaceous vegetation. With increasing disturbance, the dominant tree and shrub species are replaced by herbaceous species and the riparian area decreases in size.

Threatened, Endangered and Sensitive Plants

There are no plants found in the EIS area presently listed as either threatened or endangered under authority of the Endangered Species Act. However, there are 10 plant species that have either been found or are suspected to be in the EIS area that are under review by the U.S. Fish and Wildlife Service for possible listing as endangered or threatened status (45 CFR 82480). Information concerning the 10 plant species is found on Table 2-3. In addition, 13 plant species classified by BLM as sensitive occur in the EIS area. Information concerning these plants and their habitats (Crosby 1980) is contained in the Lakeview District files. Most of these plants are confined to very specific sites in the EIS area. The effects of current livestock grazing on the populations or habitat of these plants are generally not known.

CLIMATE

The Lakeveiw EIS area has a semiarid climate, with long, cool, moist winters and short, warm, dry summers.

The area has a winter precipitation pattern, with about 47 percent of the annual total occurring during the months of November through February. Much of this comes as snow, especially in December and January. Spring rains occur in May and June while the months of July, August and September are generally quite dry.

Precipitation tends to be elevation-dependent, ranging from less than 10 inches around Silver and Summer Lakes (4,100 feet elevation) to 30 inches at Yainax Butte (7,200 feet). Most of the area receives 10 to 15 inches of precipitation annually.

Temperatures below zero occur nearly every winter, and summer temperatures over 100° F are not uncommon. Frost-free days range from 94 days at Klamath Falls to 25 days in the higher elevations. Appendix G shows precipitation and temperature data for selected weather stations.

5 4 3 2 1 0 5
SCALE IN MILES

LEGEND

Wetland at Lake or Reservoir

Riparian Area along stream or drainage

RIPARIAN & WETLAND AREAS
Figure 2–2a

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

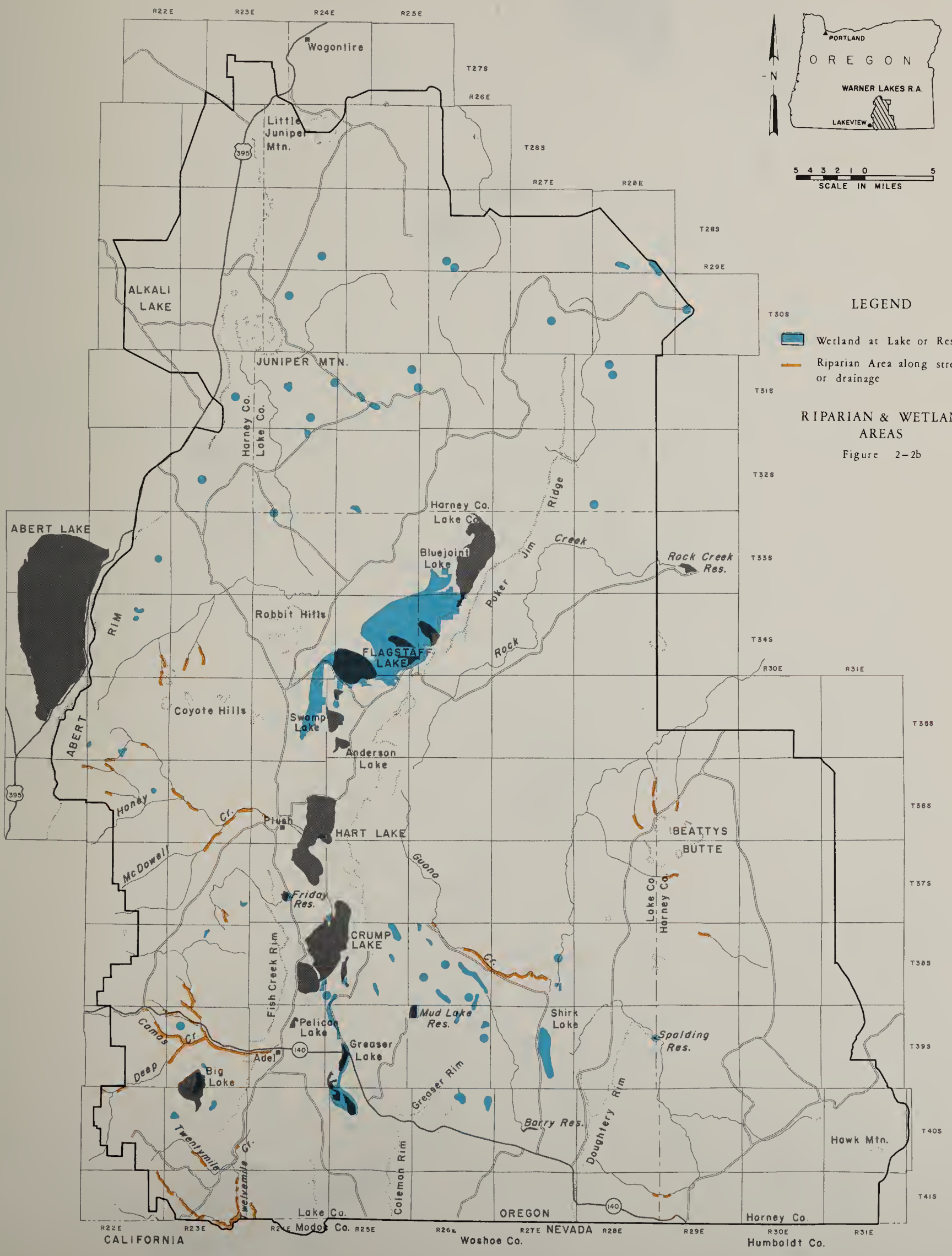
HIGH DESERT RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

WARNER LAKES RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

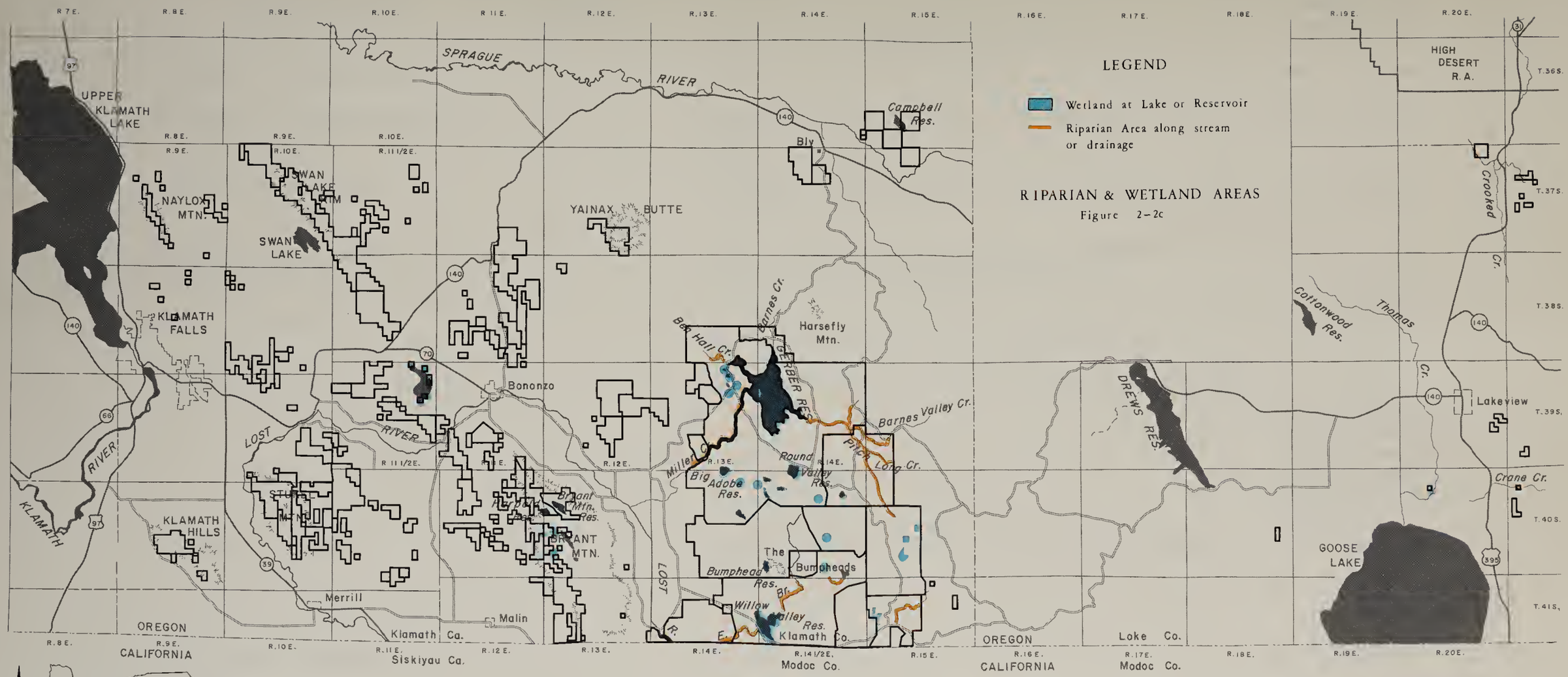


LEGEND

- Wetland at Lake or Reservoir
- Riparian Area along stream or drainage

RIPARIAN & WETLAND AREAS

Figure 2–2b



RIPARIAN & WETLAND AREAS

Figure 2-2c

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

LOST RIVER RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

Table 2-3 Plant Species Under Review for Listing as Threatened or Endangered Status 1/
Which Are Located or Suspected in the EIS Area

Scientific Plant Species Name	Notice of Review Category 2/	Habitat Information	Public Land Occurrence
Astragalus tegetaroides	2	Dry, gravelly soils associated with ponderosa pine	None confirmed
Calochortus longebarbatus var. longebarbatus	2	Streamside riparian areas, intermittently wet areas, aspen groves	None confirmed
Cypripedium montanum	2	Streamside riparian areas, undisturbed duff under ponderosa pine canopy	None confirmed
Eriogonum cusickii	1	Shallow, rocky volcanic soils associated with sagebrush and juniper vegetation types	Allotment 400
Eriogonum prociduum	1	Variable soils, vegetation types range from big and low sagebrush to conifer/mountain shrub	Allotments 103, 1307 and 517
Eriogonum sp./sp.nov.ined.	1	White tuffaceous hills associated with sagebrush	State lands within Allotment 600. Potential sites on public lands within Allotments 600 and 215
Lomatium peckianum	1	Rocky slopes and flats associated with ponderosa pine	None confirmed
Pleuropogan oreganus	1*	Not available	None confirmed
Rorippa columbiae	2	Moist sandy soils, intermittently flooded areas	None confirmed
Thelypodium brachycarpum	2	Margins of inland lake basins and alkali meadows	None confirmed

1/ As published in "Endangered and Threatened Wildlife and Plants: Review of Plant Taxa for Listing as Endangered or Threatened Species" Federal Register Vol. 45 No.242 12/15/1980

2/ Category 1 = sufficient biological justification exists for listing as Endangered or Threatened status;
Category 2 = further study is needed to determine if biological justification for listing exists.
1* = Possibly extinct. Categories are subject to change as new information becomes available.

SOILS

Soils in the EIS area have been surveyed and described in Oregon's Long-Range Requirements for Water (Lindsay et al. 1969; Lovell et al. 1969; Cahoon and Simonson 1969). A summary of the soil units and their properties appears as Appendix H.

The EIS area has been divided into seven soil groupings, as shown on Figure 2-3, General Soils. Location of soil groups relevant to allotments may be seen by comparing Figure 2-3 with Figure 1-1. Appendix I contains a list of soil units within the mapping divisions.

The Basin Land and Terrace soils (12 percent of the total land acreage within allotments surveyed) are generally deep and well drained. The Alkali Affected soils (3 percent) have excessive levels of exchangeable sodium, which make these soils generally unfavorable for plant growth. The Poorly Drained soils (3 percent) occur in marshes and the lowest parts of basins. The Sandy soils (8 percent) are susceptible to wind erosion. The Ashey soils (1 percent) have formed from pumice from volcanic eruptions which created Crater Lake and Newberry Crater. The Volcanic soils (58 percent) are the most extensive, and are stony and shallow. The Very Shallow and Very Stony soils (15 percent) are naturally low in productivity.

Erosion in the EIS area was determined by measuring soil surface factors (SSFs) (see Glossary) during Phase I of BLM's Watershed Conservation and Development inventory (see Appendix J for methodology). The SSF rating obtained for each area sampled falls into one of five erosion condition classes. The erosion condition class is a measure of an area's present state of erosion. Table 2-4 shows erosion condition class acreages for the EIS area.

Table 2-4 Summary of Present Erosion Condition

Erosion Condition Class	Present Condition (acres)	(percent)
Stable	120,216	3.7
Slight	1,361,415	42.5
Moderate	1,606,403	50.1
Critical	118,126	3.7
Severe	0	0
	3,206,160	100.0

Source: USDI, BLM 1979

5 4 3 2 1 0 5
SCALE IN MILES

R.16E. R.17E. R.18E. R.19E. R.20E.
T.22S.
R.14E. R.15E. R.21E.
Deschutes Co.
Lake Co.
Fox Butte
Walker Butte
T.23S.
R.13E. R.22E.
The Devils Garden
Lava
Lava
Cougar Mtn.
T.24S.
Green Mtn.
Lava
Bunch-grass Butte
Lost Forest
T.25S.
Fort Rock
Sand Dunes
T.26S.
R.12E. R.23E.
Christmas Valley
Christmas Lake Valley
Elk Mtn.
Connley Hills
Hayes Butte
31
T.27S.
Horse Mtn.
T.28S.
Klamath Co.
Lake Co.
Silver Lake
SILVER LAKE
Buck Creek
Bridge Creek
W. Fork Silver Creek
E. Fork Silver Cr.
T.29S.
R.12E. R.13E. R.14E. R.15E.
Ana R.
Devils Mountains
395
T.30S.
VENATOR BUTTE
Winter Ridge
SUMMER LAKE
Twin Buttes
Winter Rim
T.31S.
Jug Mtn.
T.32S.
R.23E.
ABERT LAKE
PAISLEY
Coglan Butte
Upper Chewaucan Marsh
CHEWAUCAN RIVER
T.33S.
R.16E. R.17E.
T.34S.
Moss Cr.
Lower Chewaucan Marsh
T.35S.
R.18E. R.22E.
Valley Falls
Willow Cr.
Crooked Cr.
T.36S.
R.19E. R.20E. R.21E.

LEGEND

- Basin Land & Terrace
- Alkali Affected
- Very Shallow & Very Stony
- Poorly Drained
- Volcanic
- Sandy
- Ashey

GENERAL SOILS
Figure 2-3a

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LAKEVIEW DISTRICT

HIGH DESERT RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

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LAKEVIEW DISTRICT

WARNER LAKES RESOURCE AREA

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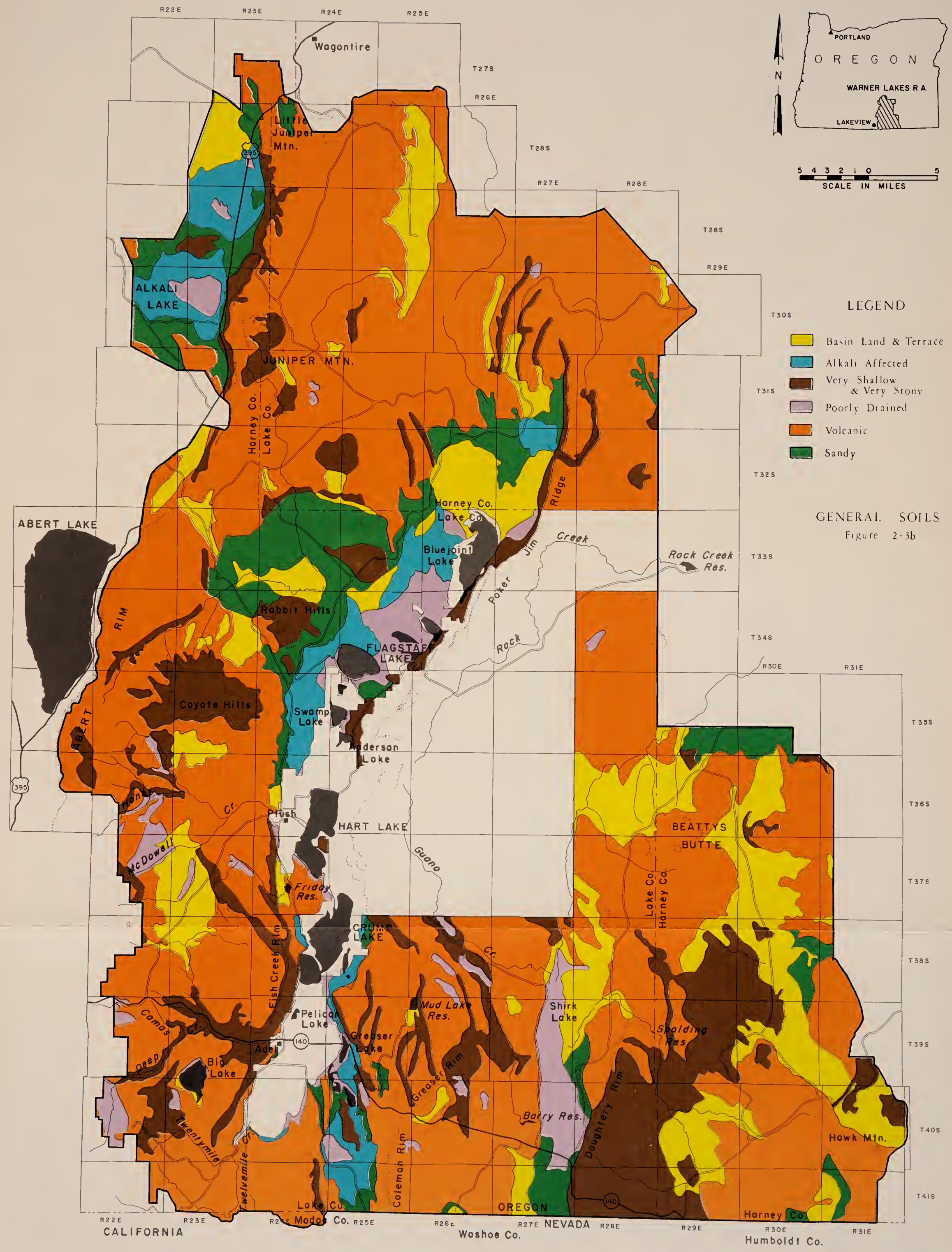

GENERAL SOILS
Figure 2-3b

LEGEND

- Basin Land & Terrace
- Alkali Affected
- Very Shallow & Very Stony
- Poorly Drained
- Volcanic
- Sandy

GENERAL SOILS

Figure 2-3c

OREGON

PORTLAND

LOST RIVER R.A.

LAKEVIEW

5 4 3 2 1 0 5

SCALE IN MILES

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WATER RESOURCES

The water resources of the area lie within the Klamath River and Goose and Summer Lakes watersheds.

Water Quantity

Snowmelt in spring and early summer provides the major part of runoff for perennial streams. During the remainder of the year, groundwater and subsurface flow are the major contributors to streamflow. Nearly all the streams in the closed basin Goose and Summer Lakes watershed are intermittent. These flow only for brief periods as a result of snowmelt or rainfall in which the intensity exceeds the capability of the soil to absorb water (Branson et al. 1972).

Annual yields from the area usually range from 0.5 to 5 inches per acre. The total annual yield from public lands averages 328,607 acre-feet per year (Pacific Northwest River Basins Commission 1970; California Region Framework Study Committee 1970).

Water on public lands is used mainly by livestock, wildlife and fish. The sources of water are streams, reservoirs, springs and wells. Over 90 percent of water on private land is used for irrigation.

Groundwater resources are found in alluvial deposits in valley areas and in volcanic rock materials. Studies made prior to 1970 indicated that groundwater withdrawal did not exceed the natural recharge in the watersheds (Oregon State Water Resources Board 1971; Pacific Northwest River Basins Commission 1970, Appendix V). Since that time, groundwater withdrawals have increased in the Fort Rock-Christmas Valley area. Technical studies to determine the effects of current withdrawals on the groundwater supply are in process.

Water Quality

Groundwater quality is generally good; dissolved solids are usually less than 1,000 milligrams per liter (mg/l) in the Goose and Summer Lakes watershed and less than 100 mg/l in the Klamath River watershed. In the Goose and Summer Lakes watershed, excessive arsenic, sodium, boron and fluoride cause problems in some places (Pacific Northwest River Basins Commission 1970; Oregon State Water Resources Board 1971).

According to the Oregon Department of Environmental Quality (ODEQ 1976a, 1976b), the instream water quality in the Klamath River and Goose and Summer Lakes drainages generally meets the established standards for the State with the following exceptions:

1. Water temperature - temperatures above 64°F are common from June to September as a result of solar heating, often on diminishing flows and unshaded streams.

2. Turbidity - snowmelt adds silt to streams. Algal blooms occcurring during low flows in the summer and fall also increase turbidity.

3. Fecal coliform bacteria - the standard of 1,000 counts per 100 milliliters is occasionally exceeded, with high concentrations occurring during periods of surface runoff.

Appendix K shows the ranges for temperature, dissolved oxygen, fecal coliforms, pH and turbidity for six stations in or near the EIS area.

WILD HORSES

All unbranded and unclaimed horses in the EIS area as of December 15, 1971 are considered wild, free roaming horses as defined in The Wild Horse and Burro Act (Public Law 92-195). Two herd management areas, as shown in Figure 2-4 and discussed in Table 2-5, currently contain the wild horses in the EIS area. There were also six horses counted in 1979 (first observed in 1973) in the Browns Valley Area of Allotment 103. Approximately 28 miles of fences within the Paisley Desert Herd Management Area restrict the movement of horses. These fences generally do not cause injuries because the horses have become accustomed to fence locations. See the Wild Horse Herd Management Plans on file at the Lakeview District Office for additional information concerning the wild horses in the EIS area.

Table 2-5 Wild Horse Herd Management Areas

Herd Management Area	Horses Counted 1979	Horses Counted 1981	Allotments Involved 1/	Condition of the Horses
Paisley Desert	184	215	400, 103	Good, reproductive
Beatys Butte	305	170 2/	600	Good, reproductive

1/ Herd Management Areas are located only in portions of the listed allotments.

2/ In January-February 1981, 272 horses were gathered in the Beatys Butte Herd Management Area.

N

5 4 3 2 1 0 5
SCALE IN MILES

R.16E. R.17E. R.18E. R.19E. R.20E.
T.22S.
R.14E. R.15E.
Deschutes Co.
Lake Co.
R.21E.
Fox Butte
T.23S.
Walker Butte
R.13E.
R.22E.
The Devils Garden Lava
Lava
T.24S.
Cougar Mtn.
Green Mtn.
Lava
Bunch-grass Butte
T.25S.
Fort Rock
Lost Forest
Sand Dunes
T.26S.
R.12E.
R.23E.
Christmas Valley
Christmas Lake Valley
Elk Mtn.
Hayes Butte
Connley Hills
31
T.27S.
Horse Mtn.
Klamath Co.
Lake Co.
T.28S.
Silver Lake
SILVER LAKE
Buck Creek
Bridge Creek
W. Fork Silver Creek
E. Fork Silver Cr.
T.29S.
R.12E. R.13E. R.14E. R.15E.
Diablo Mountains
393
T.30S.
VENATOR BUTTE
Twin Buttes
Winter Ridge
SUMMER LAKE
T.31S.
Jug Mtn.
T.32S.
R.23E.
ABERT LAKE
T.33S.
PAISLEY
Coglan Butte
Upper Chewaucan Marsh
CHEWAUCAN
R.16E. R.17E.
T.34S.
Mass Cr.
RIVER
Lower Chewaucan Marsh
T.35S.
31
R.18E.
R.22E.
Valley Falls
T.36S.
Willow Cr.
Crooked Cr.
R.19E. R.20E. R.21E.

LEGEND

- Boundary Herd Management Area
- Fences
- Rims

WILD HORSE HERD MANAGEMENT AREA
PAISLEY DESERT HERD
Figure 2–4a

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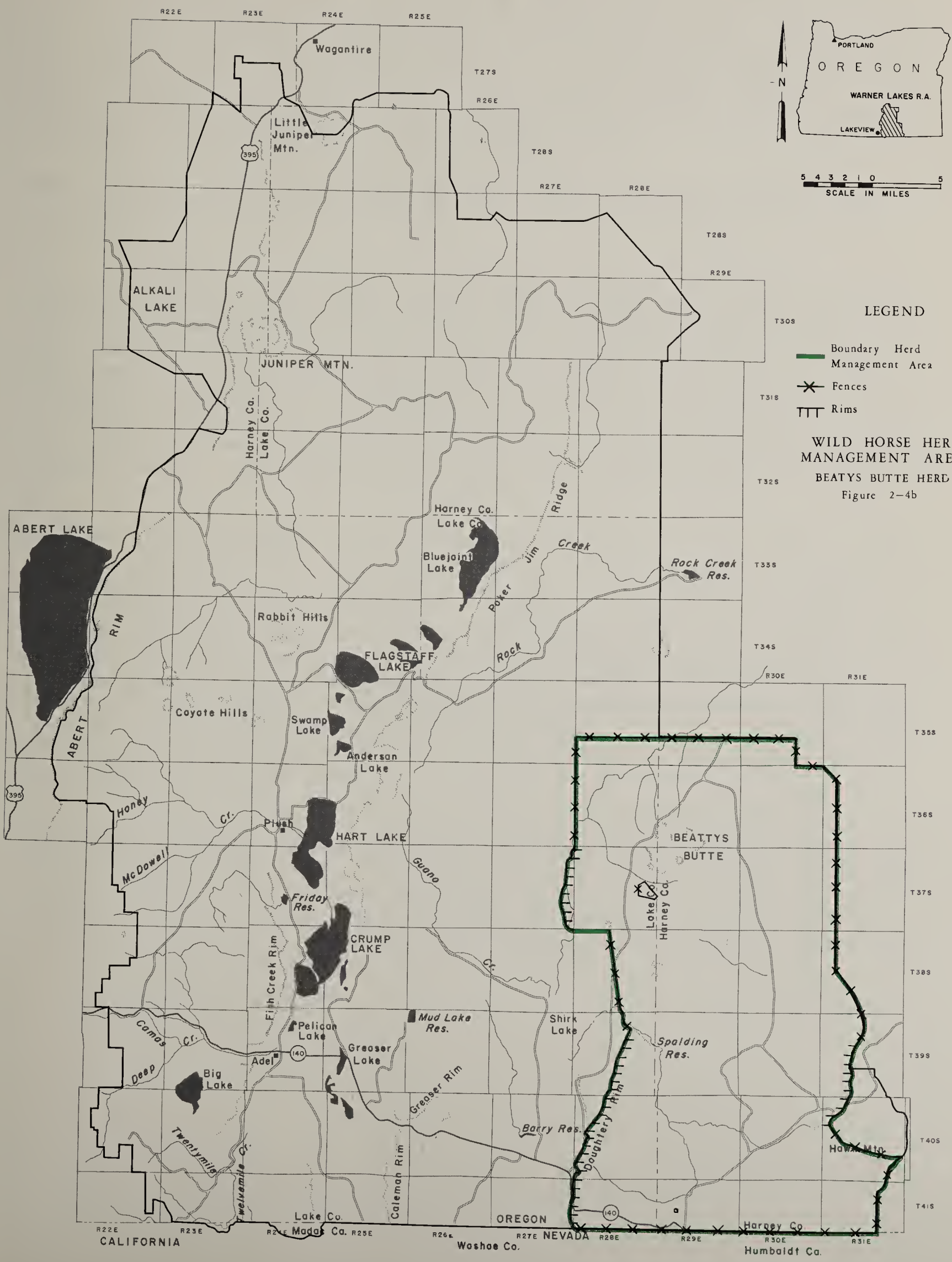

WILDLIFE

Animals discussed are those whose habitat and resulting populations would be significantly changed by the proposed action or alternatives. Data for mule deer, pronghorn antelope, bighorn sheep, water-associated birds, upland game birds and fish are summarized in Table 2-6. A complete species list with general habitat relationships is published in Wildlife of the Pacific Northwest (Guenther and Kucera 1978). A more detailed discussion of wildlife is available at the Lakeview District Office.

Mountain lion, bobcat and coyote are not discussed because populations are not expected to change significantly as a result of the proposed action or alternatives.

Crucial habitat is a small part of an animal's range or habitat that contains special qualities or features which are essential for the animal's existence. Due to its scarcity, water and associated vegetation is crucial habitat for most species. Meadows and riparian vegetation along perennial and intermittent streams, wetlands, edges of reservoirs, seeps, springs and overflows at livestock troughs are very important sources of food, water and cover. Acres of crucial riparian habitat in various condition classes are listed in Table 2-7. The following photographs illustrate good and poor wildlife habitat in riparian areas. Some other examples of crucial habitat are winter food and cover for deer, sage grouse strutting grounds and spawning gravel for fish.

In general, the greatest numbers and kinds of wildlife are found in areas with the highest habitat diversity. Habitat diversity refers to the mixture or variety of land forms, vegetation and water. Interspersion of vegetation types increases habitat diversity. Sagebrush adjacent to seeded grass increases habitat diversity around the perimeter of the seeding (edge effect). A variety of plant species also increases habitat diversity. A seeding which also contains perennial forbs, shrubs and trees has higher habitat diversity than a seeding dominated by crested wheatgrass. Structure, or the physical aspects of vegetation, can increase habitat diversity. Some examples are clumps of high grass in a grazed meadow, several age classes of aspen along a stream and snags.

Habitat diversity can be correlated with the range condition described in the vegetation section. Vegetation types with good range condition would have greater habitat diversity than similar areas in poor or fair condition. Seedings are an exception since they usually have very low habitat diversity although they are rated in good range condition. Wildlife habitat in riparian areas rated as good has much higher habitat diversity than areas rated poor (see photos and Table 2-7.)

A Riparian Area Along Willow Creek Excluded from Livestock Grazing
Good Wildlife Habitat

A Riparian Area Along Willow Creek Which is Grazed by Livestock
Poor Wildlife Habitat

Table 2-6 Data on Wildlife in the EIS Area

Animal or Animal Groups	Habitat (Public Acres)		Population	
Mule Deer	Crucial Range	305,000	Resident	4,800-5,200
	Noncrucial Range	770,000	Migratory	55,700
Pronghorn Antelope	Crucial Range	96,700	Resident	3,100
	Noncrucial Range	815,000	Migratory	700
Bighorn Sheep	Year-long Range	35,000	Resident	10-15
			Migratory	10-25
Water-Associated Birds	Crucial Wetlands	13,000	Moderate to	
	Noncrucial Wetlands	50,000	Abundant	
Upland Game Birds	Riparian	621	Low	
	Upland Habitat	900,000		
Fish 1/	65 Stream Miles		Trout are scarce	
	Excellent	3.0	to common on public	
	Good	12.5	lands.	
	Fair	16.5		
	Poor	18.5		
	Unknown	14.5		

1/ See Table 2-8

Source: USDI, BLM, Lakeview District, Bureau Planning Documents

Table 2-7 Existing Condition of Wildlife Habitat in Riparian Areas and Stream Miles

Condition 1/	Riparian Acres	Riparian Stream Miles
Excellent	0	0
Good	28	4
Fair	163	34
Poor	115	16
Unknown	388	52

1/ Riparian inventory methodology shown in Appendix L.

Source: USDI, BLM Lakeview District, 1979 Riparian Inventory

Mule Deer

Mule deer are found throughout the EIS area. Populations are increasing and are about 20 percent above Oregon Department of Fish and Wildlife objectives in the Silver Lake, Fort Rock and Wagontire Management Units (ODFW 1980). Within the last 5 years, deer numbers in Warner, Beattys Butte and Juniper Management Units have been increasing; however, ODFW has not set herd size objectives. Populations in the Klamath Falls and Interstate Management Units are about 30 percent below ODFW objectives. Public lands are used by about 53,000 deer during the winter when snow forces them out of higher elevations (Figures 1-1 and 2-5). Food and cover provided by crucial winter habitat are especially important because the deer's fat reserves decrease during the winter. Winter ranges are the first areas to greenup in the spring. The spring greenup of grasses on public lands is needed by deer to improve their weakened condition.

About 4,000 deer summer on public lands, primarily in the Warner Lakes Resource Area. Most deer in the EIS area use private or National Forest lands during the summer. Summer and early fall forage is important because it increases fat reserves needed to sustain deer through the winter.

Predation, housing developments and livestock grazing have been in conflict with deer management. Coyote predation on fawns has been high. Housing developments in Klamath County and northern Lake County have encroached on winter ranges. Spring/summer livestock grazing on public lands reduces forage and cover available to deer. Significant early season competition for the spring greenup occurs whenever livestock are continuously allowed to graze deer winter range prior to mid-April. Some seedings, water developments, juniper chainings and grazing systems have improved habitat for deer.

Pronghorn Antelope

Antelope prefer flat or rolling terrain in the low sagebrush vegetation type (Figures 2-1 and 2-5). Populations have generally been stable. Existing livestock fences do not appear to be limiting population levels. Seedings, wild fire and livestock water developments have improved antelope habitat. Dense stands of big sagebrush have been converted to low growing herbaceous vegetation which is preferred by antelope.

California Bighorn Sheep

A total of 10 bighorn sheep were released near Abert Rim during 1974-1977. Reestablishment appears to have been successful. Livestock do not use the steep, rugged Abert Rim, consequently forage competition is not a problem. Bighorn sheep from Hart Mountain National Wildlife Refuge are occasionally observed in the the Blue Joint Lake area and on Orijana Rim. See Figure 2-5 for location of bighorn sheep range.

5 4 3 2 1 0 5
SCALE IN MILES

LEGEND

- Crucial Deer Winter Range
- Crucial Antelope Winter Range
- Sage Grouse Strutting Ground
- Bighorn Sheep

WILDLIFE HABITAT
Figure 2—5a

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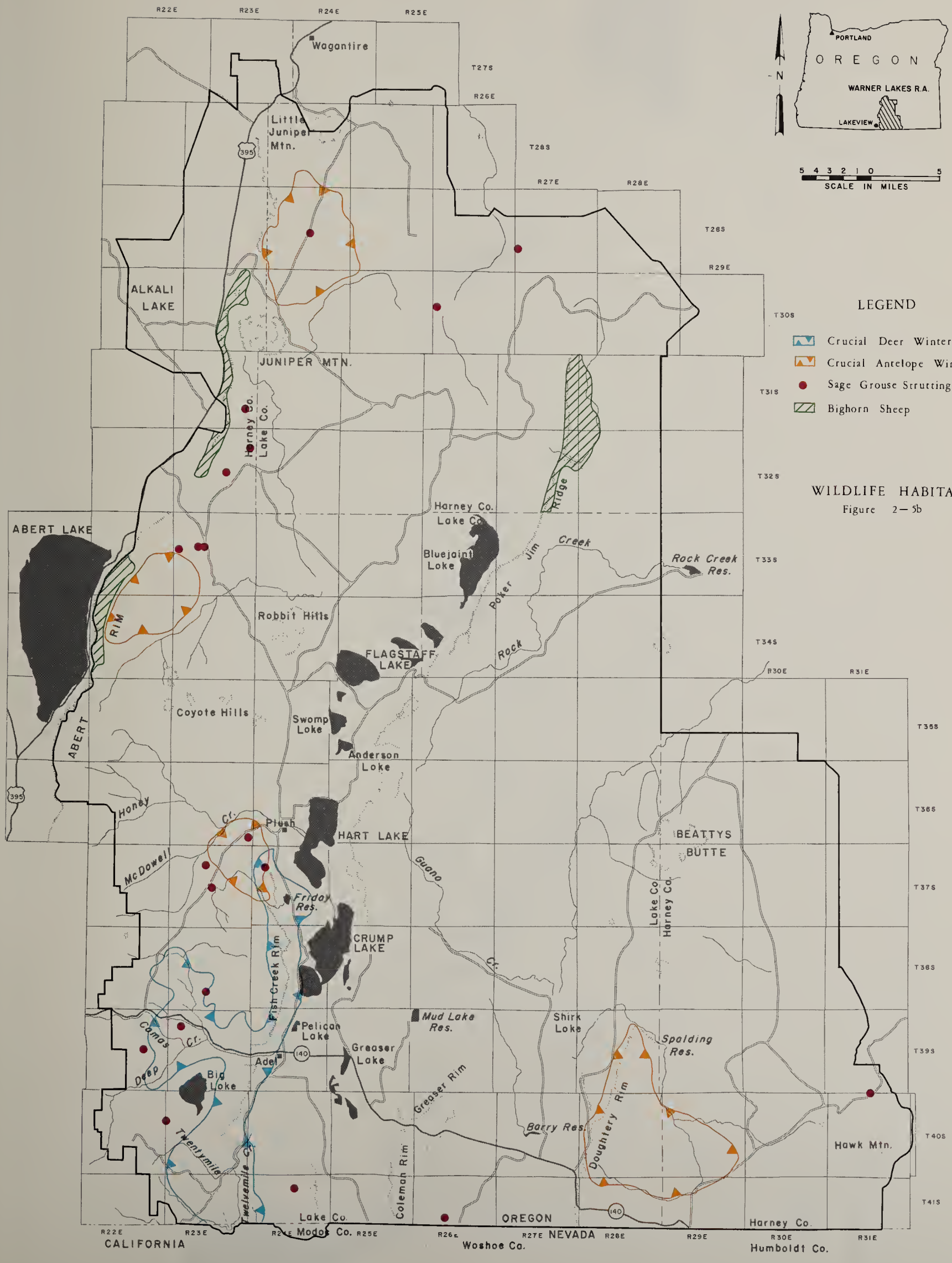
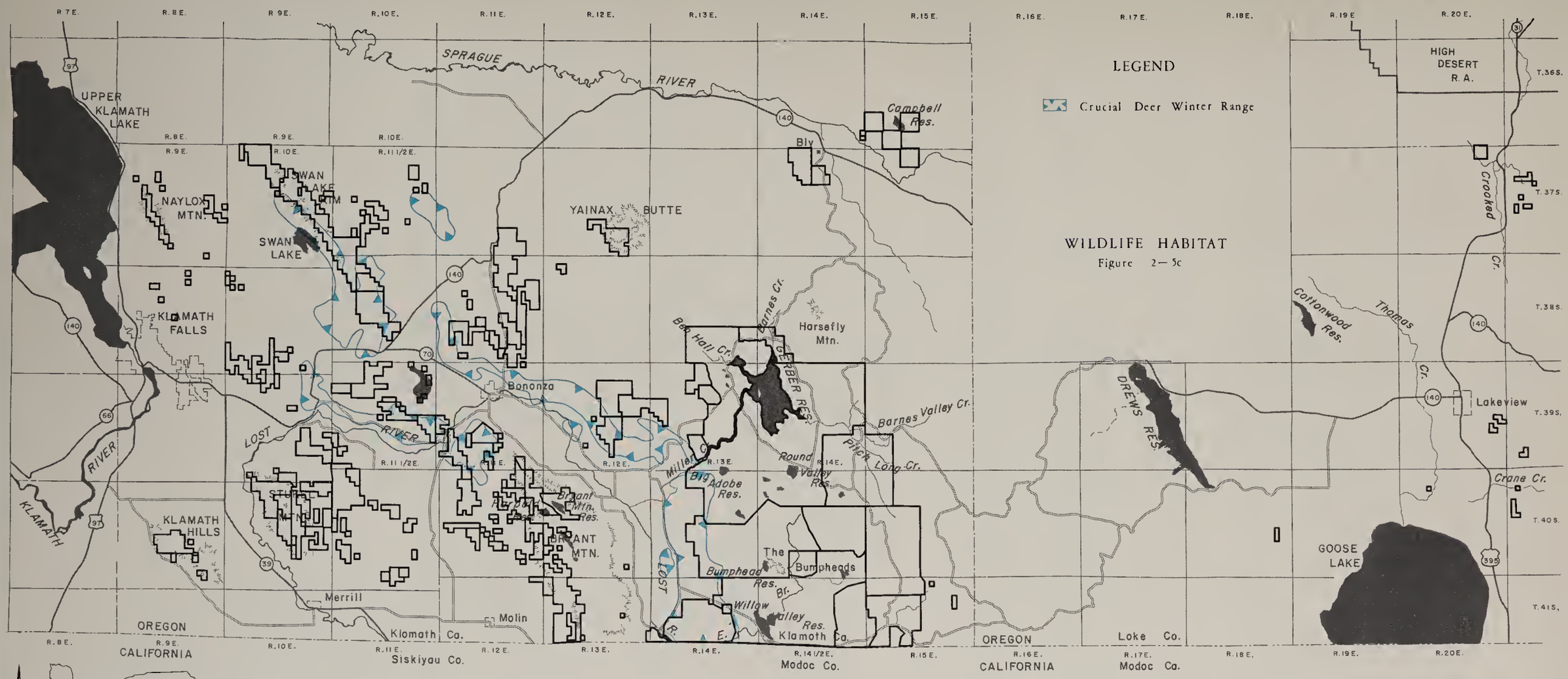
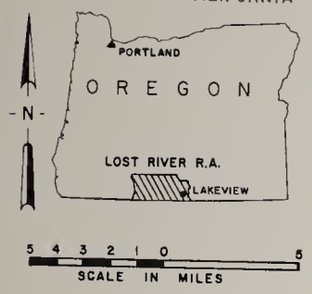


WILDLIFE HABITAT
Figure 2 — 5b





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Upland Game Birds

Sage grouse are widely scattered over the EIS area primarily in the low sagebrush type (Figure 2-1). Populations are low, reflecting a downward trend over the past 20 years. Thirty-eight strutting grounds and associated nesting areas have been located (Figure 2-5). Additional strutting grounds are suspected to exist but their exact location is undetermined. Strutting grounds and nesting areas are crucial habitat because grouse mate each year in these natural clearings in the sagebrush. Most nesting occurs within 2 miles of a strutting ground. Upland meadows are crucial habitat because they supply insects and succulent forbs to young birds (Savage 1969). Sage grouse use sagebrush extensively for food and cover.

Chukar partridge are the most common game bird in the area. Chukars concentrate in steep, rocky areas adjacent to streams and water developments.

California quail are closely associated with riparian areas along streams on public lands. (Figure 2-2). However, most populations are found on private lands. Low populations are scattered throughout the area.

Small populations of blue grouse and mountain quail are found primarily in the mountain shrub/conifer vegetation type in the Lost River Resource Area (Figure 2-1).

Water-Associated Birds

Approximately 80 species of birds use the area's wetlands during migration or for nesting. Some representative species are the Canada goose, mallard, pintail, snipe, greater sandhill crane, killdeer and long-billed curlew. Millions of birds feed and rest in Klamath Basin, Summer Lake State Game Management Area and Warner Valley. In comparison with State and private lands, relatively little feeding and nesting habitat is found on public lands. Approximately 12,700 public acres are periodically inundated and provide crucial nesting or feeding habitat. Some examples of nesting areas on public lands are the potholes at the north end of Warner Valley, Greaser Lake area, Gerber Reservoir, nearby potholes and small reservoirs (Figure 2-5). Habitat condition for nesting on public lands is often poor because residual cover heights after livestock grazing are too low for good nesting cover the following spring. About 50,000 acres of wetlands are permanant open water and not accessible to livestock. Some examples are Abert Lake and Summer Lake which are used primarily by migrating birds for resting.

Other Mammals, Other Birds, Reptiles and Amphibians

Approximately 225 of these species inhabit the EIS area. Representative species include the black-tailed jackrabbit, beaver, ravens, golden eagle, western rattlesnake and spotted frog. Some species such as the beaver are found in specific habitat types; others, such as the deer mouse, are widespread over the EIS area. Highest species diversity occurs in riparian areas (Figure 2-2).

Fish

Condition of fish habitat on the public lands is displayed in Tables 2-6 and 2-8. The present poor and fair stream condition is largely the result of irrigation, livestock grazing and flooding. Water withdrawal and release for irrigation causes fluctuating stream flows which disrupts fish production. Irrigation return flows degrade water quality by increasing water temperatures, sediments and pollutants. Livestock remove riparian vegetation and trample streambanks resulting in siltation, loss of cover and increased water temperatures. Periodic flooding and ice scouring removes riparian vegetation along streams such as Deep Creek and the Chewaucan River.

Twenty-two reservoirs/lakes ranging in size from 5 to 4,000 acres are on public lands. Some are periodically stocked with trout by ODFW, others support a warm water fishery (bass, crappie, catfish, etc.).

Threatened, Endangered and Sensitive Animals

Those wildlife species determined by the Secretary of the Interior to be threatened with extinction are on the "endangered species" list published in the Federal Register (44 FR 12: 3544, 1979).

The American peregrine falcon is classified as endangered throughout its range. Four sightings were made in 1978 involving at least three adult birds. Nesting is suspected because peregrines were observed near good nesting habitat during the breeding season. However, nesting inventories during 1978 and 1979 failed to locate a nest.

The bald eagle is classified as threatened in Oregon. Nesting has occurred at four known sites on public lands. Two nests were active during 1979. Approximately 25 to 30 bald eagles winter in the vicinity of Silver Lake. A roost has been located on adjacent Forest Service lands.

The western snowy plover and kit fox are classified by Oregon as threatened (ODFW 1977). Approximately 600 plovers inhabit the EIS area primarily at Summer Lake and Lake Abert. Populations appear healthy. Habitat suitable for kit fox occurs in the EIS area, however no sightings have been made.

The Warner sucker, Foskett Springs dace and the Hutton Springs Tui Chub are managed by the BLM as sensitive species and are on the Oregon State List of Protected Species (ODFW 1981). Their populations are small and restricted to limited habitats in the EIS area. Irrigation diversions, water withdrawals and channelization on private lands are major factors in the decline of the Warner sucker. Each spring, Warner sucker adults in Crump and Hart Lakes enter adjacent streams to spawn. Irrigation diversions have been a major obstacle to spawning fish. In addition to the migratory fish entering the streams to spawn, there are resident populations in each stream. Suckers occur on public lands in Deep Creek, Honey Creek, Snyder Creek, Fifteen Mile Creek, Twelve Mile Creek (Honey Drainage) and Twelve Mile Creek (Twenty Mile Drainage). Fencing projects presently under construction will eliminate

Table 2-8 Fish Habitat Condition and Estimated Trend

Stream	Public Stream Miles	Allotments	Present 1/ Condition	Estimated Trend	Species	Comments
Barnes Valley Cr.	4.0	882	?	?	RB,SD	Intermittent water flow
Bear Creek	.5	Unalloted	?	?	RB,BR,TC,SD,	Intermittent water flow
Ben Hall Creek	1.0	885	?	?	BG,SD,RB,LB,BC,YP	Intermittent water flow
Buck Creek	3.8	704, Unalloted	Poor/Fair	?	RB,BR,TC,SD	Low water flow, irrigation diversions, heavy livestock grazing
Bridge Creek	1.7	701, Unalloted	Poor/Fair	?	RB,BR,TC,SD	Low water flow, irrigation diversions, heavy livestock grazing
Camas Creek	4.5	202,206	?	?	RB,TC,SD	Low flows, silting, high water temperature
Chewaucan R	3.1	412	Fair	?	BB,RB,BT,BR,SD,TC	Ice scouring and cemented spawning gravels
Crane Creek	.3	1307	Fair	?		
Deep Creek	8.0	201,208	?	?	RB,TC,SD,WS	Low flow, high water temperature
Dicks Creek	.9	1306	Poor	Down		
Drakes Creek	2.7	202,206	Poor/Fair	?	RB,TC,SD	Catastrophic flooding from dam failure in 1979
Guano Creek	.3	600	?	?	CT	
Fifteen Mile Creek	3.0	211	Good/Excel.	?	RB,TC,SD	Livestock excluded from Warner sucker habitat
Honey Creek	2.6	517	Fair	?	RB,TC,SD,WS	Livestock excluded from Warner sucker habitat
Lost River, E. Branch	5.0	890,891	Good	Up	CT,SD	Existing exclosure improving trout habitat
Loveless Creek	.5	1305	?	?		
Miller Creek	5.0	882,885	Poor	Static	RB,SD	Intermittent water flow
Moss Creek	.8	407	Fair	?	SD,TC	Livestock trailing in creek
Rock Creek	2.0	888	?	?	RB,SD	Low flows, high water temperature
Silver Creek	1.8	700	Good	?	RB,BR,TC,SD	Heavy livestock grazing and recreation use
Silver Creek, W.F.	1.7	700	Fair	?	RB,BR,TC,SD	Heavy livestock grazing and recreation use
Snyder Creek	1.6	502,517	Poor	?	RB,TC,SD,WS	Livestock excluded from Warner sucker habitat
Twelve Mile Creek (Honey Cr. drainage)	2.5	502,519	Good	?	RB,TC,SD,WS	Livestock excluded from 2.4 miles
Twelve Mile Creek (Twenty Mile drainage)	3.0	211	Good/Excel.	?	RB,TC,SD,WS	Livestock excluded from Warner sucker habitat
Twenty Mile Creek	.7	211	Good/Excel.	?	RB,TC,SD,WS	
Willow Creek	2.1	405	Poor	Up	SD,TC	Loss of riparian vegetation and spring flooding limit fish production; existing exclosure improving habitat

Key to Symbols

? Undetermined or Unknown

BB Brown Bullhead	CT Cutthroat Trout	TC Tui chub
BC Black Crappie	LB Largemouth Bass	YP Yellow Perch
BG Bluegill	RB Rainbow or Redband Trout	WS Warner Sucker
BR Brook Trout	SD Speckled Dace	

1/ Condition class definitions and criteria for evaluating stream condition are shown in Appendix M. Where more than one condition class is shown this indicates portions of the stream are in two condition classes.

Source: USDI, BLM, Lakeview District, 1978 Stream Survey

livestock from many sections of sucker habitat on public lands (Table 2-8 and Figure 1-2). A few thousand Foskett Springs dace occupy a very small spring on private land. Livestock on surrounding public land have access to this spring. A much smaller population of dace is found in a nearby spring on public land. Livestock use of this spring is excluded by an exclosure fence. The total habitat of the Hutton Springs Tui Chub is on private land and entirely fenced from surrounding public land.

RECREATION

Developed recreation sites on public land include Gerber Reservoir, Crack-in-the-Ground, Sunstone Area, Highway Well, Duncan Reservoir and five hunter camps in the western portion of the EIS area. A number of other primitive sites offer opportunities for camping and picnicking.

Some recreation areas are formally designated or withdrawn for special management. Within the EIS area, these recreation management areas include Sunstone rockhound area and Abert Rim scenic area.

Hunting opportunities exist for big game, upland game, waterfowl and other species. High quality hunting opportunities occur at Warner Lakes, Drakes Flat, Coyote Hills, Colvin Timbers and Fish Creek Rim. Trout fishing occurs in perennial streams and reservoirs throughout the EIS area. Gerber Reservoir and Honey Creek offer high quality fishing opportunities.

General sightseeing is often referred to as driving for pleasure and is associated with travel along established roadways. Based on BLM records of traffic counts along minor roads in the EIS area, an estimated 6,600 visitor days annually of general sightseeing were attributed to public lands within the EIS area. Many people visit public lands with specific sightseeing goals or may sightsee while participating in other activities. A number of areas attract botanic, geologic, zoologic, scenic, archeologic, historic and cultural sightseeing use. Examples of high quality sightseeing opportunities include Crack-in-the-Ground, Abert Rim, Fort Rock, Aspen Lake, and Deep, Miller and Camas Creek Canyons.

High quality opportunities also exist for waterskiing (Crump and Hart Lakes), riding ORVs (sand dunes), hiking/backpacking (Deep Creek Canyon, Abert and Fish Creek Rims), cross country skiing (Deep Creek vicinity) and hang gliding (Stukel Mountain, Doughtery Slide and Abert Rim).

Table 2-9 shows the estimated current and projected recreational visitor use for the EIS area. Of the total visitor use in the EIS area, about 11 percent is attributable to public land.

CULTURAL RESOURCES

The BLM has a cultural resource inventory program composed of three classes of inventory (BLM Manual 8111). Minor et al. (1979) conducted a Class I existing data inventory to review and summarize existing cultural resource

Table 2-9 Estimated Current and Projected Recreational Visitation to the Lakeview EIS Area

Recreational Activity	Total Annual Area-Wide Use (1975-77) Visits	Total Annual Area-Wide Use (1975-77) Visitor Days	Visitor Days Attributed to Public Land	Demand Projection-1990 Visitor Days/Year 1/ Total	Demand Projection-1990 Visitor Days/Year 1/ BLM
Hunting	26,428	85,831	21,978	95,272	24,396
Fishing	No Data	No Data	8,796	No Data	9,764
General Sightseeing	667,636	111,440	6,625	123,698	7,354
ORV Use 2/	140,718	42,991	11,844	47,720	13,147
Camping	267,928	312,582	8,397	346,966	9,321
Picnicking 3/	120,347	16,047	1,712	17,812	1,900
Hiking	63,623	19,167	1,395	21,275	1,548
Horseback Riding	51,632	15,530	945	17,238	1,049
Pleasure Walking	432,855	6,322	3,784	7,017	4,200
Collecting 4/	5,714	5,714	5,714	6,343	6,343
Other	36,019	10,805	1,095	11,994	1,215
Total	1,812,900	626,429	72,285	695,335	80,237

1/ Visitor use projections to 1990 are based upon an estimated 11 percent increase in the populations of Klamath and Lake Counties from 1974 to 1990 (Portland State University 1976). Oregon Department of Transportation (1976) also forecasts an 11 percent increase for recreational visitation in Lake County from 1975 to 1990.

2/ ORV use in the Warner Lakes Resource Area is low or unquantifiable.

3/ Picnicking use in the High Desert and Lost River Resource Areas is low or unquantifiable.

4/ Collecting use in the High Desert and Lost River Resource Areas is low or unquantifiable.

Source: USDI, BLM 1979c.

information to depict human use and occupation of the area from prehistoric times to the present. All recorded cultural resource sites were identified through a compilation of the existing data for the Lakeview EIS area.

Class II field sampling inventories are undertaken to provide a data base for making an objective estimate of the nature and distribution of sites within the study area. Class II inventory requirements, outlined in the Programmatic Memorandum of Agreement among the BLM, Advisory Council on Historic Preservation and National Conference of State Historic Preservation Officers, dated January 14, 1980, were modified for the EIS area and found acceptable by the Oregon State Historic Preservation Officer. In their Class II inventory in Christmas Lake Valley, Toepal et al. (1980) utilized field survey methods based upon a systematic interval sampling scheme. This resulted in intensive survey coverage of 9,785 public land acres.

Class III intensive field inventories are undertaken prior to BLM actions which would result in ground disturbance or land ownership changes. The objective of a Class III inventory is to identify and record all cultural resource sites within a specified area. Class III intensive field inventories have been performed on 42,504 acres within the EIS area.

Prehistoric Sites

While little of the area has been thoroughly surveyed, 772 archeologic sites and numerous isolated finds have been documented as being within the Lakeview EIS area. Table 2-10 categorizes the 772 known archeologic sites into seven broad site types.

Table 2-10 Categorization of Archeologic Sites

County	Open	Rock Shelters	Stone Structures	Rock Art	Quarry	Burials	Trail
Harney	9	2	0	1	1	0	0
Klamath	26	1	20	4	0	0	0
Lake	546	31	22	89	16	3	1
TOTALS	581	34	42	94	17	3	1

About 79 percent of the known prehistoric sites within the EIS area are on or include land administered by the BLM. Because of the lack of data to adequately evaluate these sites, significance ratings have not been assigned. In this area where little information is available, all known sites are significant to some extent.

Four archeologic sites and one district in south-central Oregon are on the National Register of Historic Places (see Glossary):

1. Abert Lake Petroglyph Site (BLM)
2. Greaser Petroglyph Site (BLM)
3. Fort Rock Cave (Private)
4. Picture Rock Pass Petroglyph Site (BLM)
5. East Abert Lake Archeologic District (BLM)

The BLM has also identified 11 sites as potentially eligible for the National Register:

1. Gerber Reservoir District
2. Lost River/Duncan Spring District
3. Bumpheads District
4. Connley Caves
5. Five Mile Butte Caves
6. Lake Abert Area
7. Long Lake Petroglyph District
8. May Lake Archeologic District
9. Fish Creek Rim Archeologic District
10. Lucky Reservoir Site
11. Twenty Mile Slough Site

Determinations of eligibility for these sites under 36 CFR 1202 would be made prior to ground disturbance or land ownership changes which would affect the sites (36 CFR 800.4).

The potential archeologic site density for the EIS area is suspected to be high. Some areas intensively used by prehistoric people (e.g. Christmas Valley, Fort Rock Valley, Silver Lake) have a known density of about 60 sites per square mile. A density of more than 10 sites per square mile can be expected in much of Lake and eastern Klamath Counties (Oregon Department of Transportation 1978). Due to the lack of sufficient inventory data, however, only general trends can be used to predict site locations and density. In general, site distribution can be correlated to certain environmental features and resource availability. Areas with water, game, edible plants and rock for tools often contain sites. Archeologic sites are frequently found at springs, drainages, meadows and old lakeshores and lakebeds. Upland plateau areas contain numerous sites, but they are usually smaller and more concentrated than lowland sites.

Historic Sites

The vastness and isolation of south-central Oregon have played an important part in shaping the region's history. Fur trade, exploration, Indian-white relations, mining, cattle raising, overland migration, settlement, land speculation and townsite development were characteristic activities of the historic period. Transportation, lumbering and farming contributed to the economic development of the area. While parts of the EIS area have had limited historical activity, other areas such as Goose Lake and the Klamath Basin produced a fairly substantial record of events.

Table 2-11 categorizes the 166 known historic sites on or near public lands into nine broad site types according to the activities which took place at each site. Some sites have been listed twice as more than one main activity occurred there.

Table 2-11 Categorization of Historic Sites

Site Type	Number	Site Type	Number
Wagon Road/ Emigrant Trail	14	Military and/or Scientific	7
Settlement	67	Cemetery	3
Post Office/ Townsite	32	Sawmill	4
Mining	2	Agriculture	36
		Government	4

A great majority of the known sites require further documentation involving site examination and evaluation. Three portions (about one-quarter mile) of the Oregon Central Military Wagon Road on public land are currently on the National Register of Historic Places.

Paleontologic Sites

Vertebrate and certain invertebrate fossils are protected within the scope of the Antiquities Act. While the EIS area has not been thoroughly surveyed, certain fossils (including mammoth, fish, bison) are known to exist. Most sites are on private land, and there are few data dealing with site locations, significance and conditions.

The Fossil Lake locale is highly significant in North America as it is a representative site for many Pleistocene Era animals. The BLM's proposal to designate the 30,000 acre Lost Forest-Sand Dunes-Fossil Lake area as an Area of Critical Environmental Concern (see Glossary) includes 6,560 acres in the Fossil Lake area.

Further information concerning the paleontologic resources of Fossil Lake is available in Elftman 1931; Howard 1946; Martin and Howe 1977; Shufeldt 1913; and Sternberg 1884.

VISUAL RESOURCES

Three factors are considered in developing visual resource management (VRM) objectives which specify the amount of modification the natural landscape can sustain. These factors are the inherent scenic quality of the landscape, the visual sensitivity the public has for the landscape, and the visual distance (whether the landscape can be seen as foreground-middleground, background, or is seldom seen from a travel route or sensitivity area). Examples of highly scenic areas include Abert Rim, Deep Creek, Camas Creek and Twenty Mile Creek Canyons. Public lands seen from Highway 140, the Sunstone area and Highway Well Recreation Site are examples of lands highly sensitive to landscape modification.

After scenic quality, sensitivity levels and distance zones are determined, they are compared to determine the VRM classes (see Glossary) for the area. VRM classes specify management objectives and allow for differing degrees of modification in the basic elements (form, line, color, texture) of landscape features. The four classes are defined as follows:

Class I: This class provides primarily for natural ecological changes only. It is applied to primitive areas, some natural areas and other similar situations where management activities are to be restricted.

Class II: Within this class, changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the characteristic landscape.

Class III: Within this class, changes in any of the basic elements (form, line, color, texture) caused by a management activity may be evident in, but should remain subordiante to, the existing characteristic landscape.

Class IV: Within this class, changes may attract attention and be dominant landscape features but should reflect those basic elements inherent in the characteristic landscape.

Figure 2-6 shows VRM class delineations for the Lakeview EIS area.

WILDERNESS VALUES

Under the terms of the Federal Land Policy and Management Act of 1976 (FLPMA), roadless areas of 5,000 acres or more that have wilderness characteristics are to be reviewed within 15 years for possible wilderness designation.

After consideration of public comments on the BLM wilderness review, the Oregon State Director has announced his final decisions for public lands in the EIS area included in the intensive wilderness inventory. As a result, 13 areas (totaling 492,440 acres) in the EIS area were identified as Wilderness Study Areas (see Glossary).

The intensive wilderness inventory and accompanying maps for Oregon (USDI, BLM 1980a) are available in the Lakeview District Office.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Areas of Critical Environmental Concern (ACECs) are areas within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural or scenic values; fish and wildlife resources; or other natural systems or processes; or to protect life and safety from natural hazards (FLPMA Section 103(a)). Designation of an area as an ACEC does not necessarily preclude development but rather ensures the protection of sensitive values in those cases where appropriate development may take place. Prior to designation, site-specific management prescriptions are developed for each proposed ACEC. Following designation, activity plans are prepared to translate the special management requirements into on-going on-the-ground implementation actions.

Of the eight areas nominated for ACEC consideration during the Lakeview District's planning process (see Table 2-12, page 2-57), two have been proposed for designation (Devil's Garden Lava Beds, Lost Forest-Sand Dunes-Fossil Lake). The remaining six areas were found not to meet the criteria of relevance and importance, as described in the August, 1980 Final Guidelines for Areas of Critical Environmental Concern (USDI, BLM 1980b).

SPECIAL AREAS

In 1972, about 8,960 acres of the Lost Forest were designated as a Research Natural Area (see Glossary). This area, covered with pumice sand (see Chapter 2, Soils), contains interesting geologic, botanic and zoologic features (J.F. Franklin et al. 1973, Nature Conservancy 1978).

Three sites on public land (Lost Forest, Crump Lake and Warner Valley) have been identified by the Heritage Conservation and Recreation Service (HCRS) as potential National Natural Landmarks (see Glossary). The Lost Forest Research Natural Area was recommended by Daubenmire (1975) for Landmark designation. Crump Lake is a shallow, intermittent lake and marsh with waterfowl habitat (Goodwin and Niering 1971; Bostick and Niles 1975; Nature Conservancy 1978). The Warner Valley/North Warner Valley area has geologic significance and outstanding waterfowl habitat (Ibid.). Action on a recent proposal by the HCRS to designate parts of Warner Valley as a National Natural Landmark has been suspended pending further site evaluation and public input. Landmark designation is not a land withdrawal and would not affect ownership of a given area.

SOCIOECONOMIC CONDITIONS

The EIS area is located in south-central Oregon, east of the Cascade Range, off major transportation routes and distant from the major population centers of the Pacific Coast. The area lies mainly in Lake County, but also includes portions of Klamath and Harney Counties as shown in Table 2-13.

Table 2-13 Distribution of Lands Managed by Lakeview District by County

County	Acres	Percent of Total County Area
Harney	787,522	12.1
Klamath	175,726	4.6
Lake	2,864,598	53.4
Total	3,827,846	24.5

Since the part of the EIS area in Harney County is uninhabited and used mainly by Lake County residents, discussion of socioeconomic conditions is limited primarily to Lake and Klamath Counties with only incidental reference to other areas including Harney County.

N

5 4 3 2 1 0 5
SCALE IN MILES

R.16E. R.17E. R.18E. R.19E. R.20E.
T.22S. T.22S.
R.14E. R.15E. R.21E.
Deschutes Co.
Lake Co.
T.23S. T.23S.
R.13E. R.22E.
T.24S. T.24S.
T.25S. T.25S.
T.26S. T.26S.
R.12E. R.23E.
T.27S. T.27S.
T.28S. T.28S.
T.29S. T.29S.
R.12E. R.13E. R.14E. R.15E.
T.30S.
T.31S.
T.32S.
T.33S.
R.16E. R.17E.
T.34S.
T.35S.
R.18E. R.22E.
T.36S.
R.19E. R.20E. R.21E.

Fax Butte
Walker Butte
The Devils Garden Lava
Lava
Cougar Mtn.
Green Mtn.
Lava
Bunch-grass Butte
Fort Rock
Lost Forest
Sand Dunes
Christmas Valley
Christmas Lake Valley
Elk Mtn.
Hayes Butte
Coyote Hills
31
Horse Mtn.
Silver Lake
SILVER LAKE
Buck Creek
Bridge Creek
W. Fork Silver Creek
E. Fork Silver Cr.
Ana R.
Diablo Mountains
Wildcat Mtn.
Twin Buttes
VENATOR BUTTE
395
SUMMER LAKE
Winter Ridge
Jug Mtn.
ABERT LAKE
PAISLEY
Cogian Butte
Upper Chewaucan Marsh
CHEWAUCAN RIVER
Moss Cr.
Lower Chewaucan Marsh
Valley Falls
Willow Cr.
Crooked Cr.

Klamath Co.
Lake Co.

LEGEND

- Class I
- Class II
- Class III
- Class IV

VISUAL RESOURCE MANAGEMENT CLASSES

Figure 2-6a

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

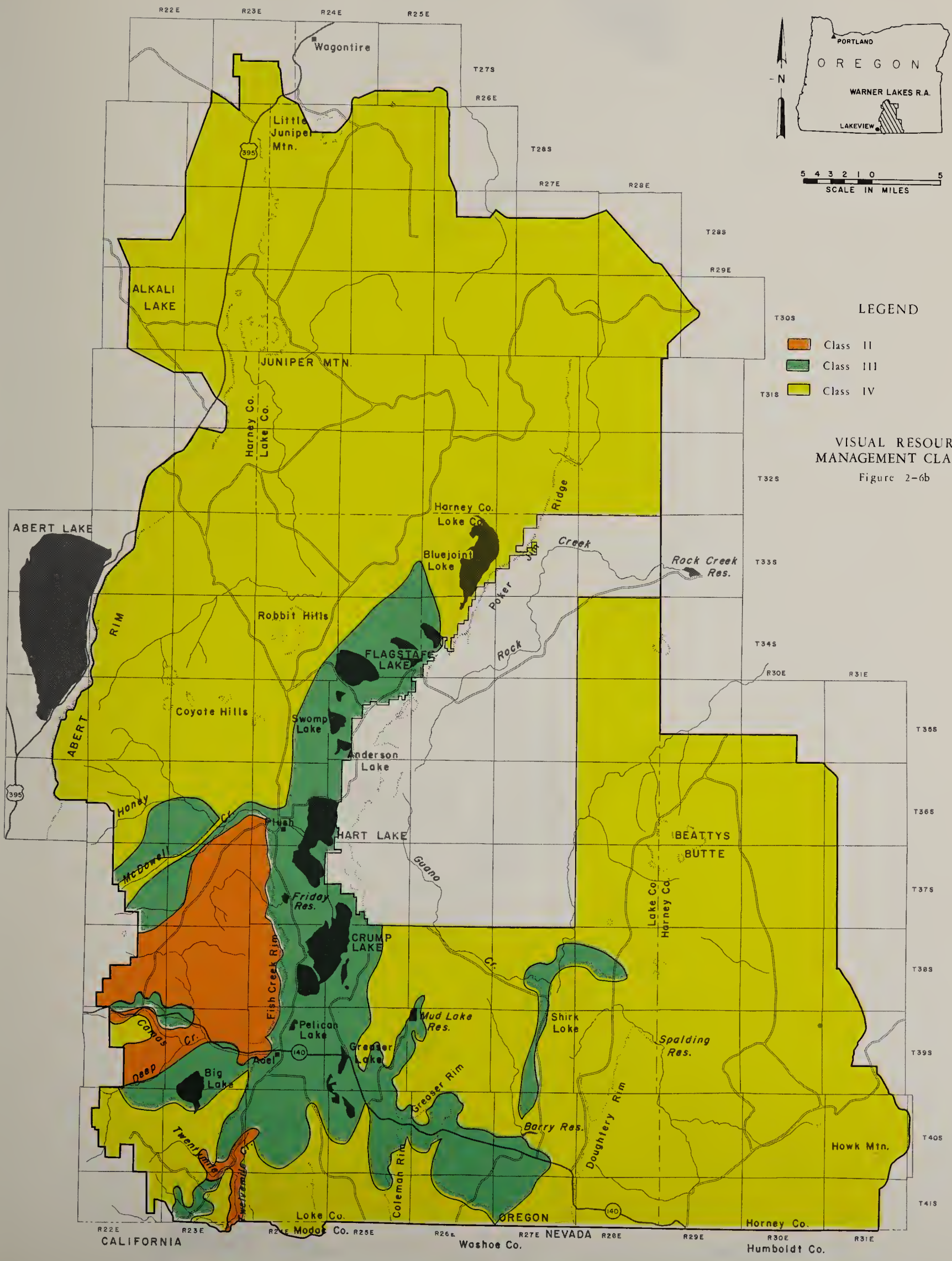
HIGH DESERT RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

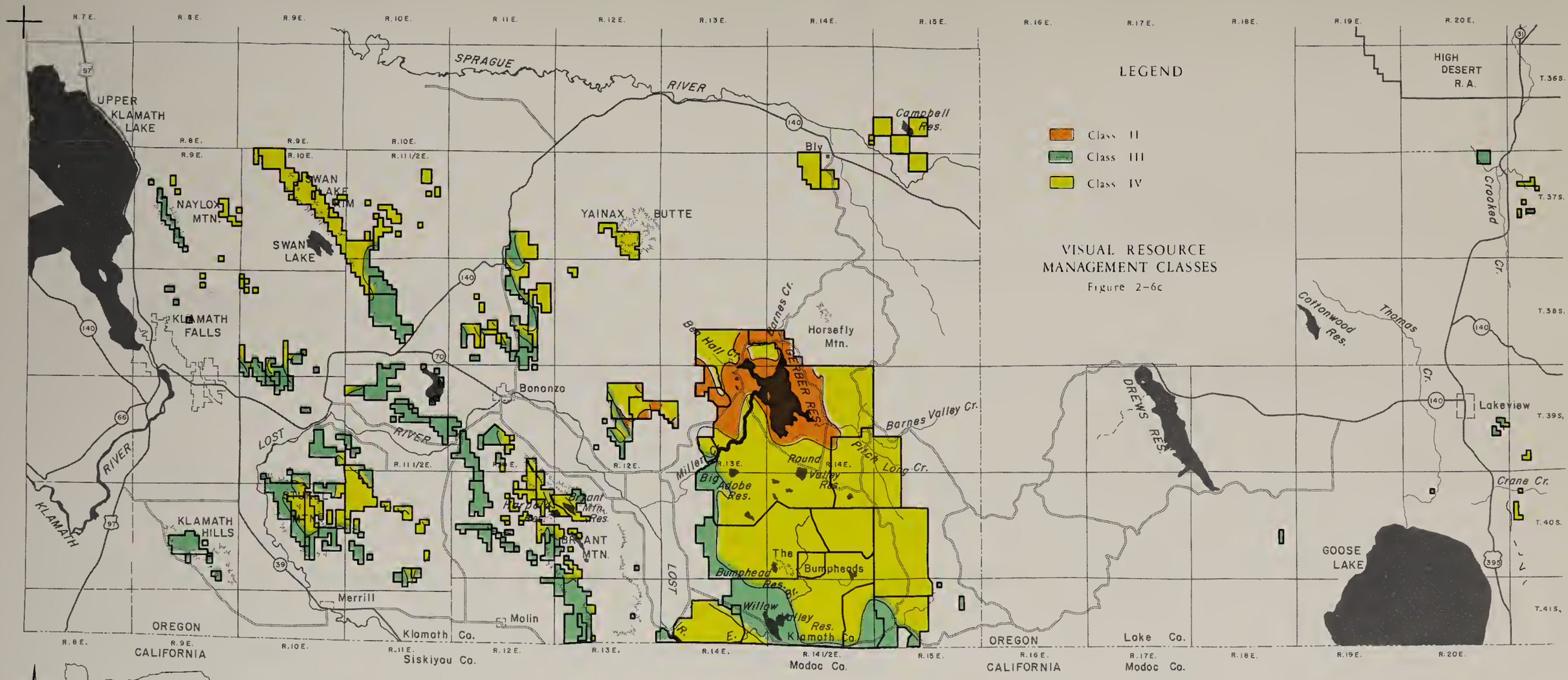
WARNER LAKES RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981



VISUAL RESOURCE MANAGEMENT CLASSES

Figure 2-6b



U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

LOST RIVER RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981

Table 2-12 Nominated and Proposed Areas of Critical Environmental Concern

Proposed for ACEC Designation	Approximate Size (acres)	Description	Resource Values	Allotment/s
1. Devils Garden Lava Beds	29,640	Unique lava tubes, cinder cones and spatter cones in a relatively recent lava flow, forest to desert transition zone	Geologic	907
2. Lost Forest-Sand Dunes-Fossil Lake 1/	30,000	Relict, isolated ponderosa pine stands and sand dunes within a low rainfall, shrub-steppe region, significant cultural resources	Archeologic, Paleontologic, Scenic, Recreational, Research Natural Area	103
Nominated but not Proposed for ACEC Designation 2/				
1. Duncan Springs	112	Large spring, native hawthorne, cutthroat trout, birds, mammals	Wildlife, Vegetation	890
2. Aspen Lake	480	Wide variety of vegetation within a small lake basin, bird and mammal habitat	Wildlife	822
3. Miller Creek Canyon	800	Varied habitat for many bird species	Wildlife	882, 884, 885
4. Black Hills	1,740	Sensitive plants	Vegetation	400
5. Crane Mountain Front	1,200	High fault bench, sensitive plants	Vegetation	1307
6. Alkali Lake	160	Chemical dump ground	Water	1001

1/ The Lost Forest is currently designated a Research Natural Area (see Glossary).
2/ These areas do not meet the criteria of relevance and importance, as described in the August, 1980 Final Guidelines for Areas of Critical Environmental Concern (USDI, BLM 1980b).

Population and Income

Population trends are shown in Table 2-14. About one-third of the population of Lake County resides in the town of Lakeview (2,763; 1980 population).

Population density in the rest of the county is less than 0.5 persons per square mile. About three-fifths of the population of Klamath County resides in Klamath Falls (16,649) and the unincorporated suburb of Altamont (19,728). Population density in the rest of the county averages about two persons per square mile.

Table 2-14 Population Trends, Lake and Klamath Counties, 1960-1980

	Lake County		Klamath County	
Year	Population	Annual Rate of Change	Population	Annual Rate of Change
1960	7,158		47,475	
1970	6,343	-1.2	50,021	0.5
1975	6,500	0.5	54,100	1.6
1980	7,523	3.0	59,002	1.7

Source: U.S. Bureau of Census 1972, 1977, 1980a

Personal income in 1978 amounted to $50,496,000 in Lake County and $415,136,000 in Klamath County. Income per capita was $7,139 and $6,994, respectively, as compared with a statewide average of $8,076 (U.S. Dept. of Commerce 1980b).

Farm/ranch proprietors experience wide variations in net income from year to year. Income in the farm/ranch sector from 1973 through 1978 is shown in Table 2-15.

Table 2-15 Farm Labor and Proprietors Income, 1973-78 1/
(Thousands of dollars)

	Lake County			Klamath County		
Year	Labor	Proprietors	Total	Labor	Proprietors	Total
1973	1,908	3,967	5,875	4,500	9,153	13,653
1974	1,999	1,642	3,641	4,670	9,833	14,503
1975	2,533	388	2,921	5,958	-4,214	1,744
1976	2,623	1,181	3,804	6,137	-3,060	3,077
1977	3,651	- 426	3,225	8,578	-9,241	- 663
1978	3,809	2,619	6,428	8,934	1,510	10,444

1/ Not adjusted for social insurance contributions, dividends, interest, rent and transfer payments.

Source: U.S. Department of Commerce 1980b

Economic Activity

In recent years (1977-79) the labor force -- people working or looking for work -- has averaged about 44 percent of the population in Lake County and about 43 percent of the population in Klamath County as compared with a 48 percent ratio for Oregon as a whole. Table 2-16 shows labor force and employment data for the two counties and the State averaged over the years 1977 through 1979.

Unemployment rates averaged about 8.4 percent in Lake County and 8.0 percent in Klamath as compared with 6.7 percent for Oregon as a whole in these years. In Lake County, self-employed proprietors amounted to over twice as large a percentage of the labor force (18.7 percent) as the statewide average (8.6 percent) due to the number of farmers and ranchers in the county.

Manufacturing employment as a proportion of total employment is below average in Lake County, but above average in Klamath County. Most of the manufacturing activity in both counties is lumber and wood products manufacture. During the years 1977-1979, employment in the construction industry averaged 60 workers in Lake County and 713 in Klamath County.

According to the 1978 Census of Agriculture (U.S. Department of Commerce 1980c) there were 306 farms and ranches in Lake County and 904 in Klamath County in that year. Farms and ranches were large on the average - Lake, 2,775 acres; and Klamath, 827 acres. A large proportion of these farms and ranches were engaged in beef production - Lake, 180; and Klamath, 485. About

Table 2-16 Average Resident Labor Force and Employment, 1977-1979
(Average number of workers during the 3-year period)

Item	Lake County		Klamath County		State Total	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Resident labor force	3,063	100.0	24,880	100.0	1,179,600	100.0
Unemployment	257	8.4	1,987	8.0	79,300	6.7
Employment	2,807	91.6	22,893	92.0	1,100,300	93.3
Proprietors 1/	573	18.7	2,617	10.5	102,000	8.6
Wage and salary	2,233	72.9	20,277	81.5	996,600	84.5
Manufacturing	450	14.7	5,323	21.4	217,000	18.4
Non-manufacturing	1,783	58.2	14,953	60.1	779,600	66.1

1/ Derived as difference between total employment and wage and salary employment and workers involved in labor-management disputes.

Source: Oregon Department of Human Resources 1978, 1979, 1980

half of those with cattle (including dairy cows) had less than 100 animals, but ranches with 100 or more accounted for about 90 percent of the cattle in each county as shown in Table 2-17.

Table 2-17 Cattle and Calves by Herd Size Class, 1978
(Number on farm (ranch) on December 31)

	Lake County			
	Farms		Animals	
Herd Size	Number	% Total	Number	% Total
1-19	36	17.0	315	0.3
20-99	60	28.3	3,179	3.3
100-499	69	32.5	16,815	17.5
500 or more	47	22.2	76,103	78.9
Total	212	100.0	96,412	100.0

	Klamath County			
	Farms		Animals	
Herd Size	Number	% Total	Number	% Total
1-19	185	31.1	1,687	1.6
20-99	201	33.8	9,338	8.8
100-499	162	27.2	35,077	33.1
500 or more	47	7.9	59,758	56.5
Total	595	100.0	105,860	100.0

Source: U.S. Department of Commerce 1980

Table 2-18 shows the value of agricultural sales from 1974 through 1978. These amounts represent the gross annual production value of all commodities and services used in agriculture. Livestock production accounts for the bulk of agricultural gross sales value in Lake County. In Klamath County, livestock production is approximately equaled by crop production consisting mainly of grain, potatoes, and hay.

Table 2-18 Value of Agricultural Products Sold, 1974-1978
(Thousands of dollars)

	Lake County		Klamath County	
Year	Livestock	Crops	Livestock	Crops
1974	6,876	2,691	20,230	28,640
1975	10,920	2,621	23,339	23,709
1976	8,322	4,134	21,704	23,279
1977	9,135	3,304	20,691	21,092
1978	13,213	3,883	24,022	25,776

Source: Oregon State University, Extension Service, Commodity Data Sheets, 1979.

The business of livestock production creates additional local sales activity through the purchases of ranchers and their business associates. A portion of these gross sales are earned by individuals as personal income. Estimates of the relationships of ranchers' sales to total gross sales and to personal income generated have been obtained from inter-industry models for these counties developed by the Forest Service for the year 1977 (USDA, FS 1980). (See Appendix N.) Applying these estimates to 1978 livestock sales figures, the total gross sales generated locally by livestock producers in 1978 is estimated at about $31 million in Lake County and about $52 million in Klamath County.

Local personal income generated by these gross sales in 1978 was $7.4 million in Lake County and $12.5 million in Klamath County or about $20.0 million in total.

Economic Significance of Public Rangeland Resources

The following sections describe the economic importance of public rangeland resources in terms of: users' forage needs, ranch property values, and financial viability; and local income and local employment dependent upon public land grazing, wildlife and recreational uses.

Dependence of Users on BLM Grazing Permits

In 1979, 145 operators with 83,965 cattle (or equivalent) held grazing permits or leases on public lands in the EIS area. The total amount of forage for which permits/leases were issued (permitted use) in 1979 amounted to 15.3 percent of the total annual herd forage requirements for these herds (17.1 percent in the Lake and Harney Counties and 6.2 percent in Klamath County).

Table 2-19 shows the average dependence on forage from public lands for operators classified by herd size. The information in this table is based on 1979 permitted use as distinguished from active preference (see Glossary). Most of the permitted use is held by the operators in larger herd size classes in Lake and Harney Counties. Only 7 percent of permitted use is held by Klamath County operators.

Table 2-19 Operator Dependence on BLM Forage, by Herd Size Class, 1979 [1]

Size of Herd	Operators		Animal Units [2]		Permitted Use on Public Lands [3]		
	Number	Percent of Total	Number	Percent of Total	Amount (AUMs)	Percent of Total	Percent of Requirements
			LAKE AND HARNEY COUNTIES				
Under 100	13	17.1	815	1.2	1,545	1.1	15.8
100---399	19	25.0	3,969	5.7	5,712	4.0	12.0
400---999	24	31.6	13,741	19.7	26,473	18.4	16.1
1,000 & Over	20	26.3	51,240	73.4	109,780	76.5	17.9
Total	76	100.0	69,765	100.0	143,510	100.0	17.1
			KLAMATH COUNTY				
Under 100	27	39.1	1,131	8.0	1,580	15.0	11.6
100---399	31	44.9	6,040	42.5	4,399	41.6	6.1
400---999	10	14.5	5,813	40.9	3,505	33.2	5.0
1,000 & Over	1	1.5	1,216	8.6	1,084	10.3	7.4
Total	69	100.0	14,200	100.0	10,568	100.0	6.2
			EIS AREA				
Under 100	40	27.6	1,946	2.3	3,125	2.0	13.4
100---399	50	34.5	10,009	11.9	10,111	6.6	8.4
400---999	34	23.4	19,554	23.3	29,978	19.5	12.8
1,000 & Over	21	14.5	52,456	62.5	110,864	72.0	17.6
Total	145	100.0	83,965	100.0	154,078	100.0	15.3

1/ Data pertains to livestock operators holding forage permits from BLM within the EIS area. Forage on National Forest and State lands is not covered.
2/ Reported livestock herds were converted to animal units (AU) each equivalent to one cow, one horse, or five sheep.
3/ Represents forage use for which a permit/lease was issued in 1979 grazing year (3/1/79-2/29/80).

Table 2-20 shows the seasonal pattern of grazing use on public lands. Use is heaviest in May and June and declines sharply in the fall months.

Table 2-20 Percentage of Monthly Forage Requirements Supplied by BLM Forage, by Herd Size Class, 1979 1/

Month	Under 100	100-399	400-999	Over 1,000	All Operators
March	-	-	2.0	8.3	6.0
April	5.3	4.8	16.8	19.0	16.8
May	40.8	24.5	39.8	30.8	36.8
June	40.8	23.5	24.0	33.0	30.0
July	34.5	15.0	15.3	22.8	20.3
August	30.3	9.5	10.3	22.5	18.3
September	15.5	7.5	8.3	10.5	10.3
October	10.0	4.3	6.0	4.0	4.8
November	4.0	0.5	4.8	-	1.5
December	1.0	1.0	14.3	1.0	3.8
January	-	1.0	12.0	1.0	3.8
February	-	-	4.8	1.5	1.8
Average	13.4	8.4	12.8	17.6	15.3

1/ Data is for 1979 grazing year, March 1, 1979 to February 28, 1980.

BLM Grazing Licenses and Ranch Property Values

The Bureau of Land Management does not recognize grazing permits/leases as vested property rights; however, de facto effects on private asset valuation may occur. Based on BLM file data and contract appraisal studies in the Lakeview area, the asset value of public forage licenses is estimated to be about $40-$45 per AUM.

Estimates of the values placed on grazing permits/leases associated with ranch properties when sold have varied widely from the estimate of $40-$45 per AUM given above. A recent study of ranch sales in Grant and Umatilla Counties found no statistically valid evidence that public grazing use affected ranch sale values (Winter 1979). However, grazing preferences have sold at prices ranging from $22 to $55 per AUM in southern Idaho according to the Owyhee Grazing Management FEIS (USDI, BLM 1980c).

Active preference in 1979 is shown in Table 2-21 for each herd size class in total and for the average and maximum individual holding.

Table 2-21 Active Preference by Herd Size and by Area, 1979 Grazing Year

Herd Size Class	Total AUMs	AUMs Per Operator Average	AUMs Per Operator Maximum
LAKE AND HARNEY COUNTIES			
Under 100	2,734	210	917
100-399	7,713	406	1,684
400-999	27,323	1,138	3,460
1,000 or more	116,669	5,833	32,657
Total	154,439	2,032	--
KLAMATH COUNTY			
Under 100	1,752	65	220
100-399	5,544	179	977
400-999	3,666	367	2,655
1,000 or more	1,162	1,162	1,162
Total	12,124	176	--
EIS AREA			
Under 100	4,486	112	917
100-399	13,257	265	1,684
400-999	30,989	911	3,460
1,000 or more	117,831	5,611	32,657
Total	166,563	1,149	--

Financial Viability of Ranch Enterprises

In this discussion, reference is made to three terms which may require explanation: overall carrying capacity, debt service capacity and debt load. Overall carrying capacity is the herd size which can be prudently maintained on the forage sources which a ranch has available. It is a concept used by lenders in appraising a ranch for loan purposes. Debt service capacity is the amount of money regularly available (cash flow) to the rancher which could be used to make interest and principal payments if any debt were incurred. It represents the maximum amount of debt for which the rancher could meet the payments. The debt load is the relative size of debt payments among other costs.

The ability of ranch enterprises to survive the adjustments which might be required by a loss of grazing privileges is related to their ability to make the necessary payments on additional debt. A ranch free of debt is able to borrow more to make necessary adjustments in operations, but also (initially at least), has no fixed debt payments to be made if ranch operations must be scaled down. The greater the proportion of fixed costs such as debt payment in a ranch budget, the more inflexible the operation becomes because a certain level of operation must be sustained in order to cover the fixed costs. Differences in debt loads (per unit of carrying capacity) account for a major part of the differences in overall costs among ranches of the same size.

In the absence of information on existing debt loads, this discussion focuses on the debt service capacity of a ranch in total rather than on any capacity remaining after current debt service needs are met.

As a means of measuring debt service capacity, ranch budget information (presented in Appendix O) on income and expenses is used to develop estimates of "return above cash costs" for several ranch herd size classes. Return above cash cost is the amount of money available after payment of cash costs (See Appendix O) to cover the support of the rancher's household, replacement of capital equipment (depreciation), and repayment of interest and principal on intermediate or long-term loans.

The estimates are presented in Table 2-22. A representative ranch with less than 100 cows, in the Lake County portion of the EIS area for example, is estimated to have about $10,200 left out of the average year's receipts to cover household expenses, depreciation and non-short-term debt. This amount divided by annual forage requirements (12 x herd size) is the return above cash cost per AUM.

Return above cash cost is a guide to the effect of public grazing reductions on ranch operations, but its defects need to be kept in mind. First, it does not take into account the differential effects among individual ranchers with different debt loads. Second, it does not reflect the changes in average costs (and returns) which may occur with substantial changes in the level of operations. That is, if operations are reduced, and costs are not reduced proportionately, then average cost per unit increases and return above cash cost per unit will decline.

Local Income and Employment Effects

The gross sales of ranchers holding BLM grazing permits/leases in the EIS area is estimated to have been about $13.5 million annually on the average for the years 1977-1979. These estimates represent price conditions during a period which included the high beef price years, 1978 and 1979. Gross sales for operator using grazing land in Lake and Harney Counties was about $10.4 million, and gross sales for those in Klamath County about $3.1 million.

Table 2-22 Average Return Above Cash Costs Attributable to Forage from Public Land and to All Forage Sources 1/
(1977-79 average prices)

Herd Size	Amount per AUM	Amount per Operator	
		Public land	All sources
LAKE AND HARNEY COUNTIES			
Under 100	$13.53	$ 1,600	$ 10,200
100---399	10.46	3,100	26,200
400---999	12.55	13,800	86,300
1,000 or more	$11.53	63,300	354,500
All sizes		$22,100	$128,800
EIS AREA 2/			
Under 100	$13.53	$ 1,100	$ 7,900
100---399	10.46	2,100	25,100
400---999	12.55	11,100	86,600
1,000 or more	$11.53	60,900	345,600
All sizes		$ 12,400	$ 81,200

1/ Based upon estimates of average "Return Above Cash Cost" developed by Economics and Statistics Service (Gee 1981). (Appendix 0)

2/ No budgetary survey data were obtained for Klamath County ranches, but it was assumed that survey estimates for Lake and Harney County ranches were applicable to Klamath County ranches in developing estimates for the EIS area.

Based on the estimated multiplier effect of the industry, the total gross sales generated among all businesses in these counties by these ranchers' dealings amounted to about $24.2 million annually in Lake County and $6.7 million in Klamath County.

Estimates of local personal income derived from the beef raising activities of ranchers who hold grazing permits/leases are presented in Table 2-23. Based on 1978 personal income levels, beef production accounted for $7.4 million, or 15 percent of Lake County income, and $12.6 million, or 3.0 percent of Klamath County income. The $5.8 million generated by operators in the EIS area in Lake County amounted to 11 percent of Lake County income, and the $1.6 million in Klamath County amounted to 0.3 percent of that county's income. The portion of their forage derived from public lands was responsible for about 2 percent of the total personal income in Lake County and 0.02 percent in Klamath County.

Employment in livestock and other local industries attributable to grazing public lands is about 94 workers. This estimate was made by dividing the income estimates in Table 2-23 by 1978 average annual earnings in covered employment in Lake and Klamath Counties ($11,676) (Oregon Employment Division 1979, 1980).

Income from Recreational Activity

Some local economic activity is generated by hunting and fishing and by other recreational acitivity on public lands. Public lands in the 1975-77 period accommodated 26 percent of hunting activity, an unknown percentage of fishing activity. and about 8 percent of the recreational acitivity in the EIS area. (See Recreation, Table 2-9.)

In the 1975-77 period, expenditures related to hunting and fishing on public lands in the EIS area amounted to about $672,000 annually. Expenditures of other recreationists using public lands were about $356,000 more. Personal income to local residents resulting from these expenditures amounted to about $250,000 per year.

Table 2-23 Local Personal Income Generated by Livestock Production 1/, BLM Operators and All Ranchers (1977-79 average prices)

County	BLM Operators		
	Public Forage	All Forage	All Ranchers
Lake 2/	$1,000,000	$5,800,000	$ 7,400,000
Klamath	100,000	1,600,000	12,600,000
EIS Area	$1,100,000	$7,400,000	$20,000,000

1/ Derived as amount of total personal income (direct, indirect and induced) generated in the private sector by a unit increase (or decrease) in total gross output in the agriculture sector from inter-industry tables shown in Appendix N.

2/ Includes operators with cattle operations in Harney County.

Social Conditions

Social conditions which might be affected by any of the alternative management plans for the EIS area are primarily those relating to the residents of Lake and Klamath Counties. Groups interested in these public lands include the ranching industry, the timber industry, the mining

industry, conservation groups, historical groups, archeological groups, wild horse groups, hunting and fishing groups, other recreation-oriented groups and local resident groups. Use of the lands involved or their products by people living outside the local area is generally too minor to affect social conditions.

The group most likely to be affected is the ranching industry, or more properly, the ranching subculture. This group is strongly cohesive because its members share a similar environment and experiences differentiated and isolated from the rest of society. The social and attitudinal characteristics of this group appear to be similar to those discussed by Grigsby (1976) for adjacent Harney County. That study showed that the ranching subculture perceives itself as characterized by the traditional strengths and values associated with the "pioneer spirit": independence, rugged individualism, adaptability, practicality, and enjoyment of the variety of types of labor and direct contact with nature which ranching provides. Bureau planning documents for the EIS area indicate many Lake County ranches are owned by "old" families and many ranches are operated in traditional ways. Within the past 10 years, more young adults are remaining on family ranches, apparently to maintain a way of life. Ranchers may mistrust the BLM and its planning process since the use of public land for cattle production is an integral part of the ranch operation.

A second group which may be differentiated in the local area is the rural or small town population, which comprises the bulk of the remaining population of the area. This group is generally less dependent on use of the public lands in the EIS area, but tends to share the views and attitudes of the ranch subculture as a social role model.

A third group is the metropolitan population of Klamath Falls. This group being farther removed from the ranch subculture is likely to place higher priority on recreational use of public lands.

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

CHAPTER 3 ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Throughout this chapter, environmental consequences (impacts) are compared to the existing situation, as described in Chapter 2.

The significant impacts resulting from implementation of the proposed action and each of the alternatives are analyzed in this section. If a resource is not affected or if the impacts are considered insignificant, no discussion is included. Analysis, including the scoping process, indicates that there would be no significant impacts upon air quality, minerals, climate, geology or timber. The Federal Land Policy and Management Act prohibits expanded grazing uses or proposed range improvements which would impair areas for wilderness preservation (see Standard Procedures and Design Elements for Range Improvements, Chapter 1).

The major actions which cause impacts are allocation of existing and future forage production, implementation of grazing systems, change in period of use and installation of range improvement projects. No change is expected from the existing situation on the unalloted areas (137,844 acres); therefore, these areas are not discussed further. Management of those public lands fenced in with and/or administered by the U.S. Forest Service (approximately 1,000 acres) is not analyzed.

The following criteria were used to determine the nature and extent of impacts identified:

Beneficial impact:	Resource conditions would improve relative to the existing situation.
Adverse impact:	Resource conditions would deteriorate relative to the existing situation.
No impact:	Resource conditions would remain the same as the existing situation.
Short term:	The 10-year period needed to complete the range improvement projects and implement grazing systems.
Long term:	Twenty years after initiation of the proposed action or alternative (10 years for implementation plus 10 additional years).

The following assumptions have been made as a basis for the impact analysis:

- The proposed action or any alternative selected would be fully implemented as described in Chapter 1.

- Monitoring studies would be completed as indicated and adjustments made as needed.

- Grazing systems would be followed.

- The principal resource directly impacted would be vegetation. Any changes in production, condition and trend of vegetation would affect other resources.

- Personnel and funds would be provided to implement the proposed action or any alternative within the stated timeframe.

- Standard procedures and design elements would be effectively carried out for construction of range improvement projects in the proposal or any alternative.

- Regular maintenance would be carried out to maintain the functional capability of all range improvements.

IMPACTS ON VEGETATION

Each component of the proposed action and the alternatives is expected to have an impact on the vigor and reproduction of the key species (Table 1-1). Actions which enhance a species' vigor and reproduction cause an increase in the number and size of that species in a plant community. Conversely, if the action adversely affects a plant's vigor and reproduction, the species affected will decrease in number and size in the plant community. (Throughout this section, this occurrence will be referred to as increase or decrease in composition.) For purpose of analysis, it is assumed that available nutrients, primarily water, are now essentially fully utilized by the present vegetation. Consequently, any increase in the amount of the key species would result in a similar but opposite change in the amount of some other herbaceous species. However, no significant reduction of woody species is expected. A decrease in key grass species would result in an increase in woody species such as sagebrush and herbaceous species such as cheatgrass.

Changes in other vegetative characteristics such as forage production, range condition and trend, residual ground cover, as well as riparian vegetation and threatened or endangered plants, are dependent upon composition changes. Consequently, discussion of general changes in composition expected from each component of the proposed action and each alternative will precede the analysis of impacts to the above characteristics. A summary of the impacts to characteristics is shown in Table 3-1.

Impacts to the seven major vegetation types will not be discussed separately by group because the plants most affected by the proposed action and the alternatives are found in a greater or lesser extent in almost every vegetation type. Consequently, the expected changes in key species would occur in nearly every vegetation type although in somewhat different proportions depending upon the present composition and potential of the site and the actions being proposed.

In general, composition changes in the mountain shrub conifer and juniper vegetation types are not expected to be significant except where juniper control is proposed.

Table 3-1 Long-term Vegetation Impact Assessment

Vegetative Characteristic	Existing Situation	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Range Condition (Acres)							
Good	596,154	2,082,920	839,877	2,023,007	2,511,735	1,727,446	2,087,828
Fair	1,773,713	517,130	1,061,691	347,481	439,088	810,839	513,819
Poor	738,970	508,996	1,207,345	738,970	158,091	570,761	507,712
No Data 1/	95,345	95,136	95,269	94,724	95,268	95,136	94,823
Range Trend (Acres)							
Upward	1,533,458	2,770,354	923,357	3,204,182	2,770,234	2,130,605	2,779,558
Static	1,416,306	297,178	786,134	0	297,198	988,714	292,500
Downward	116,782	136,650	1,494,691	0	136,750	84,863	132,124
No Data	137,636	0	0	0	0	0	0
Residual Ground Cover (Acres)							
Increasing	0	1,815,970	0	3,199,436	1,849,048	1,136,270	2,493,727
Static	0	1,212,054	3,161,434	4,740	1,179,755	1,893,346	661,293
Decreasing	0	133,402	0	0	132,631	131,818	6,414
No Data	3,204,182	42,748	42,748	0	42,748	42,748	42,748
Forage Production (AUMs)	183,187	248,022	183,187	183,187	384,621	231,217	248,011
Riparian Vegetation Trend (Acres)							
Improving	0	568	409	660	506	568	657
Static	0	89	122	0	118	89	0
Declining	0	2	128	0	35	2	2
No Data	694	35	35	34	35	35	35

1/ Acreage classified no data varies by alternative due to the differences in acreage under exclusion.

Vegetation Composition

This section analyzes the expected changes in plant composition within the allotments proposed for intensive management. Because these changes are caused by the three components of the proposed action and alternatives (vegetation allocation, grazing systems and range improvements), a brief description of each component precedes the impact assessment.

The following analysis identifies the general changes in composition of the key species that are expected to result from the component of the proposed action and each alternative. (See Table 1-1 for components by alternative.) Since significant composition changes usually take several years, the following analysis is confined to a discussion of long-term impacts.

Estimates of changes in composition of desirable species were based upon observations by district personnel, professional judgment, analysis of similar systems elsewhere and cited studies. Much of this information is believed to be applicable since it concerns similar actions and plant communities.

Vegetation Allocation and Grazing Systems

The vegetation allocation (Appendix B, Tables B-1 and B-4) inherent in the proposed action and the alternatives determines the degree of utilization of the key species.

The vegetation allocation for all but Alternative 1 would result in forage use being equal to or less than the present forage production. Utilization of the key species except in Alternative 1 would be equal to or less than the proposed action. Under Alternative 1, heavy utilization of the key species would continue on 10 allotments. (See Appendix B, Table B-1 for these allotments where a significant livestock reduction (10 percent or greater) is scheduled.)

Under the proposed action and Alternatives 3 and 5, the current grazing system would change on 1,753,706 acres or about 55 percent of the area. Alternative 4 would result in grazing system changes on 1,038,644 acres. Alternative 2 would result in the entire area being excluded from grazing; impacts to vegetative composition are therefore discussed in the Exclusion and Restrictive Use section.

Winter Grazing System

The winter grazing system would allow heavy (65 percent) utilization of the previous season's growth. Herbaceous plants are in a state of dormancy at this time with all of the food reserves stored in the roots. Livestock would be removed prior to the plant initiating growth in early spring.

Grazing during this season favors reproduction and seedling establishment because livestock trample litter and scatter seed further from water developments than summer grazing.

Conclusion

Winter grazing would increase herbaceous key species composition on 311,010 acres under the proposed action and Alternatives 3, 4 and 5. Alternative 1 would result in similar increases on 328,543 acres. No riparian areas are within areas proposed for winter grazing.

Spring Grazing System

Spring grazing would result in moderate utilization (50 percent) of a combination of the previous season's growth and the current season's early growth of herbaceous key species. Livestock are removed while the plants are still growing; therefore, only 20-30 percent of the current season's growth is removed. The time the area is in a grazed condition is the shortest of any grazing system since regrowth is almost complete by June 30, approximately 45 days after livestock removal.

Grazing during this period requires plants to draw heavily upon food reserves to replace the grazed portions. However, grazing would cease while adequate soil moisture is still available for the grazed plants to reach full growth, produce seed and fully replenish food reserves. Consequently, this form of grazing is expected to promote the vigor of both herbaceous and woody key species (Stoddart, Smith and Box 1975, p. 133; Cook 1971). This system would enhance the production of perennial grasses since production of a large number of viable seed is dependent upon vigorous mature plants (Hanson 1940). Seedling establishment would depend upon the intensity of grazing in the spring following germination. If seedling plants are not physically damaged through trampling or being pulled up, they would normally be firmly established by the start of the third growing season (Stoddart, Smith and Box 1975, p. 483).

Conclusion

The composition of herbaceous key species would increase on 144,602 acres under the proposed action and Alternatives 3, 4 and 5. Similar increases are expected on 100,355 acres under Alternative 1. No riparian areas would be within a spring grazing system under the proposed action and Alternatives 4 and 5; 3 acres of riparian vegetation would have increases in key species under Alternatives 1 and 3.

Spring/Summer Grazing System

Spring/summer grazing would allow 50 percent utilization of the annual production of key species during the late spring and summer each year. Grazing would begin each year at a time when carbohydrate reserves are low and would continue until after seedripe.

Although the proposed stocking rates would achieve 50 percent utilization on most areas, factors such as terrain, location of fences and water, type of livestock and the type of vegetation would often result in heavy grazing (60-80 percent of the annual vegetation production) in one portion of an

allotment and light use (20-40 percent) in another area. A rapid decrease in key species composition is expected on those areas within an allotment which receive heavy utilization -- primarily areas adjacent to water developments and valley bottoms. Spring/summer grazing at the Squaw Butte Experiment Station (approximately 50 miles north of the EIS area) resulted in heavy utilization of 37 percent of the range; over an 11 year period, this produced change in species composition toward dominance by less desirable bunchgrasses such as Sandberg bluegrass. Cook (1971) showed in studies of the grazing response of cool season perennial bunchgrasses that 50 percent utilization was too severe for continuous late spring and summer use. The two species of grasses in the study correspond in stages of vegetative growth to the key bunchgrasses in the EIS area.

Conclusion

Approximately 60 percent of the area under spring/summer grazing would have decreases in herbaceous key species composition. This would occur on 931,424 acres under Alternative 1; 81,990 acres under the proposed action and Alternative 3; 79,274 acres under Alternative 5; and 50,918 acres under Alternative 4. Declines in herbaceous and woody key species would occur on 124 acres of riparian vegetation under Alternative 1 and on about 2 acres under the proposed action and Alternatives 3, 4 and 5. Key wetland species such as meadow grasses would decrease on portions of 7,901 acres proposed for spring/summer use under Alternative 1 and about 319 acres under the proposed action and Alternatives 3, 4 and 5.

Spring/Fall Grazing System

Spring/fall grazing would result in utilization of the herbaceous key species during the early portion of their growing period. Very little use of the woody key species is expected during this time. Grazing would occur again in the fall when herbaceous key species are dormant; however, moderate utilization of woody key species would be expected. This system would maintain the vigor and reproduction of the herbaceous key species. Woody key species would decrease slowly in composition because stocking rates would be based upon 50 percent utilization of herbaceous species but utilization of the more palatable woody species during the fall season is expected to be heavier.

Conclusion

The spring/fall grazing system would allow maintenance of the existing composition of herbaceous key species and woody key species on 21,237 acres under Alternative 1 and on 12,991 acres under the proposed action and Alternatives 3, 4 and 5. Under Alternatives 1 and 3 approximately 30 acres of riparian vegetation would be grazed under the Spring/fall system. Woody vegetation is expected to decrease in these areas.

Deferred Grazing System

The deferred system would result in grazing after most of the herbaceous key species have completed growth. Moderate utilization (60 percent) of shrubs

encourages growth of additional twigs and therefore increases forage production. Reproductive capacity, on the other hand, is decreased over the years, since increased twig growth reduces the development of flowers and fruits (Garrison 1953 Cited by Stoddart, Smith and Box 1975, p. 135). Where woody key species are found in limited numbers, some individual shrubs would be selected by cattle and heavily browsed, resulting in reduced vigor and eventual death of these plants; however, the total shrub mortality is expected to be insignificant. The critical growth period for woody key species occurs in late summer.

Livestock normally concentrate in riparian areas under deferred grazing. Livestock use of the riparian areas under deferred grazing is expected to be light or moderate in several areas due to factors such as inaccessibility (e.g., Guano Creek) and lack of adequate shade and water on adjacent upland areas (e.g., Deep Creek). Some areas under Alternatives 1 and 3 would be heavily grazed.

Conclusion

Deferred grazing is expected to increase the composition of the key herbaceous species on 89,669 acres under the proposed action and Alternatives 3, 4 and 5. Alternative 1 would result in a similar increase on 96,956 acres. In riparian areas, the proposed action and Alternatives 1, 3 and 4 would result in maintenance of woody key species on 89 acres. Deferred grazing with heavy utilization under Alternatives 1 and 3 would decrease woody riparian vegetation on 4 acres and 32 acres respectively.

Deferred Rotation Grazing System

Under the deferred rotation grazing system, grazing use during the critical growing period would be alternated with grazing during early spring or late summer/fall in successive years. The early spring grazing would end early enough to give most herbaceous key species an opportunity to replenish food reserves and maintain good vigor. The late summer grazing would occur after food reserves of the key species have been stored. As a result, the vigor of the key species would be maintained at an acceptable level.

Reproduction of woody key species would not be improved because the sequence of grazing treatments does not provide sufficient protection from grazing to allow seed production and seedling establishment. No areas of riparian vegetation are located within the areas proposed for deferred rotation grazing.

Conclusion

Deferred rotation grazing would result in the maintenance of the existing key species composition on 169,205 acres under the proposed action and Alternatives 3 and 5. Similar results are expected on 145,679 acres under Alternative 4 and on 17,958 acres under Alternative 1.

Rotation Grazing System

Rotation grazing results in the key species being grazed during part of the growing season every year. This system would result in grazing during the critical growing period being alternated with early spring grazing the following year. The early spring grazing would end in time for the key species to replenish food reserves (see Spring Grazing System). As a result, the decline in vigor caused by use during the critical part of the growing season is somewhat offset by early grazing in alternate years.

Since utilization levels would be moderate (50 percent), the rotation grazing system is expected to only slightly enhance the reproduction of the herbaceous key species on native range because every pasture is grazed each year. Many new seedlings would be grazed or pulled up before becoming established. Woody key species would improve in vigor and reproduction because they are normally not grazed by livestock during the spring and early summer (Vavra and Sneva 1978).

Conclusion

As a result of the rotation grazing system, an increase in composition of woody key species would occur on 7 acres of riparian vegetation under the proposed action and Alternatives 3 and 4. On the remaining vegetation types, the current herbaceous key species composition would be maintained on 72,234 acres under the proposed action and Alternatives 3, 4 and 5, and on 960 acres under Alternative 1.

Rest Rotation Grazing System

Rest rotation grazing results in moderate (60 percent) utilization of key species in the use pasture. Most of the use occurs during the growing season. Approximately 25-33 percent of the area is completely rested from grazing each year. The need for periodic complete rest from grazing arises from the fact that even at proper stocking rates, continuous grazing usually results in utilization of the most palatable plants beyond the proper use level. The heaviest use usually occurs on the most accessible areas resulting in a decline in the key species composition. Hormay (1970) states that these species can be maintained by periodically resting the range from use by means of rest rotation grazing systems. Rest periods allow the plants to complete the stages of vegetative growth, seed production and food storage. In addition, it provides for seedling establishment and allows litter to accumulate. Rest rotation would allow flexibility in livestock management during periods of drought.

Photo studies in three allotments (207, 215 and 515) indicate that rest rotation grazing increased the utilization of less desirable plant species thereby reducing the total removal of key species during the period of use. This results in less competition for moisture and nutrients between key species and other plants. In Wyoming, a 10 percent reduction in utilization of key species occurred on wet and dry bottom land after implementation of rest rotation grazing (Johnson, W.M. 1965, Cited in Hickey 1966), leading to

an improvement in key species vigor. In the Lakeview District, a comparison of the range conditions in allotments under rest rotation management with conditions in allotments under other systems showed that conditions were significantly better on the allotments under rest rotation. Approximately 26 percent of the acres in the rest rotation system were rated good condition while about 15 percent of the acres under all other systems were in good condition.

Conclusion

Rest rotation grazing would result in significant increases in key species composition on 2,208,471 acres under the proposed action; 2,209,177 under Alternative 3; 2,145,809 acres under Alternative 5; 1,673,912 acres under Alternative 4; and 633,486 acres under Alternative 1. A slight improvement in key species composition would occur on 352 acres of riparian vegetation under the proposed action and Alternative 4; 418 acres under Alternative 3; 321 acres under Alternative 1; and 90 acres under Alternative 5. Following implementation of rest rotation grazing, increases in key species would occur on portions of 9,122 acres of wetland vegetation under the proposed action and Alternative 4; 9,935 acres under Alternative 3; 2,235 acres under Alternative 1; and 1,760 acres under Alternative 5.

Exclusion and Restrictive Use

Exclusion consists of no authorized livestock grazing use. All public lands within the EIS area would be excluded under Alternative 2. Under the proposed action and Alternatives 3, 4 and 5, small areas containing riparian vegetation would be excluded from livestock grazing (see Table 1-2). The implementation of Alternative 4 would result in the additional exclusion of livestock from the two wild horse herd management areas shown in Figure 2-5. Consumptive uses by wild horses and wildlife would continue within the exclusion areas where they now occur.

There would be an initial improvement in vigor of herbaceous key species in exclusion areas because the reduced level of utilization would allow most key species to complete vegetative growth and reproduction. No significant increases in key species composition are expected in areas dominated by poor condition stands of sagebrush or on vegetation types such as greasewood which have a low potential for herbaceous key species improvement. Studies in higher precipitation zones (Owensby 1973) have indicated that as much as 40 years of complete rest would be required for range in poor condition to fully recover. Following evaluation of sagebrush-grass vegetation excluded from grazing for 23 years, Tueller (1960) concluded that no significant improvement in key species composition would occur due to exclusion alone. He determined that supplementary treatment would be necessary to increase the composition of key species on poor condition ranges.

Under Alternative 4, the annual consumption of approximately 24,000 AUMs -- much of it during the critical growing season -- by wild horses would prevent key species increases from occurring within the two herd management areas, offsetting any benefits expected from livestock exclusion. Herbaceous key

species would decrease in areas of concentration such as waterholes and spring sites. One large area of exclusion in Allotment 103 (Fossil Lake Exclusion) would result in significant increases in herbaceous species on 6,560 acres.

Exclusion of livestock would occur for a period of 3-5 years on 1,732 acres under the proposed action and Alternative 4. This would allow the key species, particularly those in the riparian areas, to increase in composition. Key wetland species such as meadow grasses and sedges would increase on about 855 acres during the period of exclusion. Upon resumption of livestock grazing, management at the proposed levels of utilization would maintain the improved species composition in these areas.

The impact of exclusion to riparian key species is discussed under the Impact to Riparian Vegetation section.

Conclusion

Under Alternative 2, key species composition would initially increase throughout the EIS area; however, the change would be insignificant on ranges in poor condition. Under the other alternatives, exclusion would impact primarily riparian vegetation and vegetation associated with wetlands. Key species increases are expected on 129 acres under the proposed action and Alternative 4; 565 acres under Alternative 5; 661 acres under Alternative 2; 77 acres under Alternative 3; and 76 acres under Alternative 1. Meadow type vegetation would improve on portions of 9,330 acres proposed for exclusion under Alternative 5; 12,516 acres under Alternative 2; 785 acres under the proposed action and Alternative 4; and 745 acres under Alternatives 1 and 3.

Range Improvements

The removal of vegetation inherent in completion of the range improvements (Appendix B, Table B-5) would cause both a temporary (1-5 years) and permanent (over 5 years) change in composition of the key species as shown in Table 3-2.

Table 3-2 Acres of Vegetation Disturbance Due to Range Improvements 1/

	Water Developments 2/		Fences		Vegetation Manipulation 3/	
	Temp.	Perm.	Temp.	Perm.	Temp.	Perm. 4/
Prop. Action	2,159	1,650	214	0	252,357	252,357
Alt. 3	3,032	2,353	215	0	1,284,659	1,284,659
Alt. 4	1,859	1,433	320	0	176,757	176,757
Alt. 5	2,159	1,650	614	0	252,767	252,767

1/ No range improvements are proposed under Alternatives 1 and 2.
2/ Includes springs, reservoirs, wells, pipelines and waterholes.
3/ Includes juniper control, brush control and seeding.
4/ Consists of long-term changes in species composition.

Vegetation manipulation is proposed primarily on poor condition low sagebrush and big sagebrush vegetation types where significant improvement would require more than 10-15 years using grazing management alone. The acreage of vegetation disturbance shown in Table 3-2 for vegetation manipulation represents a conversion of approximately 55 percent of the sagebrush types under Alternative 3; 11 percent under the proposed action and Alternative 5; and 7 percent under Alternative 4.

The expected species composition of the treated area would depend primarily on the proposed method of brush control and whether the area would be seeded. Crested wheatgrass along with other suitable species would be seeded on 362,948 acres under Alternative 3; 189,499 acres under the proposed action and Alternative 5; and 144,729 acres under Alternative 4. Based on observations of existing seedings in the EIS area and studies of similar areas in Oregon (Findley 1974), crested wheatgrass would compose 50-90 percent of the seeded area but species composition would vary according to the success of the brush control and the survival of other species in the seed mixture. (See Appendix B, Table B-3 for a list of allotments which would have shrubs included in the seed mixture.)

Sagebrush would be temporarily eliminated from the areas proposed for burning (Appendix B, Table B-3) because sagebrush does not resprout following fire; however, reestablishment on those sites not proposed for reseeding is expected after a period of 30 years (Harniss 1973). If undesirable sprouting shrubs such as rabbitbrush and horsebrush are present in the plant community, burning may result in large increases in these species at the expense of more palatable species (Blaisdell 1953). The effect of burning on perennial bunchgrasses varies with the intensity of the fire, season of the burn and the species of grass. Sandberg bluegrass, junegrass, bluebunch wheatgrass and squirreltail, where present, would increase on areas proposed for burning. Since Thurber needlegrass and Idaho fescue have been shown in some studies to be significantly damaged by burning (Britton 1978), the amounts of these species would be temporarily reduced in the burned areas. Several studies in Idaho indicate that fall burning does not harm most forb species (Britton 1978). Spring burning on Forest Service lands near the EIS area significantly improved the vigor of forb species (Adams 1980).

The proposed spraying of 2,4-D for brush control would temporarily reduce sagebrush in the treated areas (Appendix B, Table B-3). Spraying would be in accordance with the standard procedures and design elements described in Chapter 1. Increases in native bunchgrass production of more than 200 percent have been shown to occur following spraying of sagebrush with 2,4-D (Hyatt 1966). Annual forbs such as mustards would increase, while perennial forbs such as lupine and buckwheat would decrease following spraying. Muegler and Blaisdell (1958) showed about a 30 percent increase in total forb production several years following spraying of sagebrush.

Following treatment, seeded areas would be dominated by crested wheatgrass. Some forbs and sagebrush would be present depending upon the design of the spray project, the success of the control, the seeding mixture, the

reestablishment of sagebrush seedlings in the first 2 years after treatment and the following year's precipitation.

The proposed juniper control would significantly reduce the composition of western juniper on 2,320 acres under the proposed action and Alternatives 4 and 5 and 3,070 acres under Alternative 3. Increases in key shrub and herbaceous species composition would occur within the treated areas as a result of the reduced competition.

Some of the new spring developments would cause a major change in species composition in riparian areas. As springs are developed, water previously supporting small areas of riparian vegetation would be diverted to livestock water troughs. Fencing would protect any remaining vegetation on the overflow areas. Over the long term, more riparian vegetation would be protected by fencing than would be lost through spring development.

The construction of water developments would have a localized impact on the vegetation around each development. Livestock tend to congregate around water, eating all the available forage in the immediate vicinity. The development of new water sources would also allow livestock to use an unquantified amount of previously unavailable forage and thus would reduce grazing pressure on areas near existing water sources. The new water areas would lead to more uniform livestock grazing use and result in fewer heavily grazed acres. Thus, water developments combined with grazing systems would promote an increase in the composition of the key species.

Residual Ground Cover

The estimated changes in residual ground cover (see Glossary) shown in Table 3-1, Summary of Impacts to Vegetation, are based on expected changes in livestock utilization, key species composition and total herbage production.

The lower levels of utilization on allotments where downward adjustments are proposed (see Appendix B, Table B-1) would increase the amount of vegetative cover remaining after livestock grazing is completed. Upward adjustments in livestock use would result in higher levels of utilization and proportional decreases in residual ground cover.

Rest rotation, deferred, winter or spring grazing systems and livestock exclusion would all result in improved key species vigor with an increase in fibrous-rooted perennial herbaceous species and increases in total herbage produced. Perennial species provide more year around cover than annuals because there is less year-to-year variation in production and most of the plant material remains intact throughout the fall and winter. Annuals, however, are subject to large year-to-year fluctuations in production. Herbage production decreases associated with spring/summer grazing (see Forage Production) would result in proportional decreases in the amount of residual ground cover. Exclusion would result in decreases in live vegetative cover but an increase in standing dead material and litter, hence an increase in residual gound cover.

Vegetation manipulation projects which would reduce short-term herbage production would also produce short-term decreases in live vegetative cover. However, a long-term increase in residual ground cover would result. The largest short-term reduction of residual ground cover would occur on the areas using burning for the proposed method of brush control (See Appendix B, Table B-3) because undecomposed litter would be consumed by the fire.

No significant change in wildfire occurrence is expected by the projected changes in residual ground cover. Although more vegetation would remain after grazing, a larger portion of the total vegetation would be composed of perennial key species and less would be sagebrush and annual plants. Perennials remain green longer than annuals and are not as susceptible to fire as sagebrush overstory/annual understory areas. An analysis of fire occurrence records covering a period before and after livestock reductions indicated that climate conditions and other factors such as access, type of fire-fighting equipment and human activities were the primary factors in the number and size of wildfires.

Range Condition and Trend

The future range condition of the study area is highly dependent upon the changes in vegetation characteristics described in the previous section. As key species composition and residual ground cover increases, range conditions will improve. Expected range conditions over the long term are shown in Table 3-1, Summary of Impacts to Vegetation.

Expected long-term changes in range condition and trend are based on several assumptions which are derived from observations of district personnel, study data, review of pertinent literature and professional judgment. See Appendix E for methodology. The assumptions used to predict future range condition include the following:

- Grazing systems which satisfy the physiological requirements of plants for growth and reproduction (see Grazing Systems) would improve fair condition range to good condition. Although some improvement of poor condition range can be expected, the rate of improvement is much slower than better condition range. Studies by McLean and Tisdale (1972) and Owensby (1973) showed that at least 20, and as much as 40, years of rest would be required for poor condition range to completely recover. Under moderate use, a similar period of time would be expected for these areas to improve enough to be rated one condition class higher.

- Poor condition ranges proposed for vegetation manipulation would improve to good condition over the long term. These areas would have significant increases in key species composition and residual ground cover.

- Good condition ranges which would increase in key species and vegetative cover would remain classified in good condition.

- No significant changes would occur to the juniper, greasewood, rabbitbrush and miscellaneous vegetation types unless they are treated. These

areas generally have a sparse understory and have a low potential for increases in cover and key species composition.

- Under complete exclusion, all areas would be in good condition over the long term.

Forage Production

Forage production is highly dependent upon the composition of the key species and is thus also related to range condition. This relationship is due to the key species being the preferred forage species. When key species increase under proper grazing management, forage production also increases; vice versa, as the key species composition decreases, forage production also declines. Although the grazing exclusion proposed under Alternative 2 would result in key species increases, forage production is not expected to increase because of the effect of vegetation stagnation. In Nevada, Tueller (1979) found that bitterbrush and sagebrush yields declined by 70 percent and 36 percent, respectively, as a result of total grazing exclusion. Grazing stimulates lateral branching of shrubs and, by removing the coarse material of perennial grasses, promotes production of fine-stemmed forage in the spring.

The future forage production as outlined on Tables 1-5 and 3-1 was predicted using the methodology outlined in Appendix C. The future forage production of both the seeded and native range areas was based upon the present production of areas which had similar treatments.

Riparian and Wetland Vegetation

The riparian key species are mostly woody species. Impacts to vegetation in the riparian areas are largely based upon the projected effect on the woody vegetation. If the woody species are allowed to increase, the remaining herbaceous species also would benefit. Inpacts to wetland vegetation are based mainly upon the projected effect on sedges and meadow grasses.

Livestock exclusion would be beneficial to the woody key species. Exclusion provides an opportunity to maintain vigor and sufficient time for establishment of seedlings and new sprouts. Therefore, an increase in composition of key species is expected on the areas where this system is proposed.

Increases in woody key species would occur in the riparian areas under rest rotation, spring and rotation grazing management. Very little change in composition of the woody key species would be expected on the areas under deferred grazing where utilization is light and moderate. A decrease in composition of these key species is expected on the areas where the spring/summer and spring/fall systems would be used and on the areas which would be heavily grazed under the deferred system. Riparian vegetation does not occur in areas proposed for winter and deferred rotation grazing systems. Restrictive use under the proposed action and Alternative 4 would result in significant increases on 80 acres of riparian vegetation. Table 3-1 shows the acres where an increase, no change or decrease in riparian vegetation is expected.

The maximum benefit to wetland species composition would occur under rest rotation and exclusion. Spring/summer grazing would reduce herbaceous key species in the wetland vegetation type. (See Table 3-6 for acres of wetland vegetation by grazing system.) Impacts to wetland vegetation are also described under Vegetation, Grazing Systems section.

Of the proposed range improvements, only spring development would have a direct impact on the riparian vegetation. These projects would cause disturbance of up to 8 acres of riparian vegetation. However, in the long term, fencing of spring developments and the subsequent exclusion of grazing within the fenced areas would increase the composition and production of the key species in the riparian area. (See analysis of spring developments in Impacts to Vegetation Composition, Range Improvements.)

Threatened, Endangered and Sensitive Plants

Site specific information concerning the impact of current livestock grazing is lacking for the 10 plant species under review for Federal listing as threatened or endangered status shown in Table 2-3 and the 13 plants classified as sensitive by BLM; therefore, the impact of proposed changes in livestock management cannot be accurately predicted. Adverse impacts due to vegetation manipulation and range improvement construction would be avoided by conducting intensive plant inventories of the project area and modifying the design as needed in accordance with Bureau policy (Chapter 1). A potentially beneficial impact to populations of Eriogonum prociduum located in Allotment 1307 would occur under all the alternatives except Alternative 1. Livestock would be excluded from this allotment under the other alternatives and the proposed action.

IMPACTS ON SOILS

Vegetation Allocation and Grazing Systems

Under the proposed action and Alternatives 3, 4 and 5, the proposed vegetation allocation and grazing systems would increase protection of the soil from erosion in the EIS area by increasing residual ground cover (vegetation and litter accumulation). Under Alternative 2, ground cover (particularly litter accumulation) would increase significantly, protecting the soil surface from erosion. With the decrease in the amount of forage consumed by livestock, more vegetation and litter would be left at the end of each grazing season. In the long term, perennial grasses would increase and annuals would decrease (see Chapter 3, Vegetation, Residual Ground Cover, for discussion). Perennial grasses have a more extensive root system to hold soil in place and provide, on the average, more persistent ground cover than annuals. Bailey and Copeland (1961 Cited by Mattison et al. 1977) found that as vegetation and litter cover increased, overland flow of water and erosion decreased. This protective cover would reduce soil movement, reduce raindrop impact and decrease compaction, thus increasing infiltration into the soil. Under Alternative 1, on allotments that are overstocked, soil erosion would increase. Erosion would decrease on allotments with proper stocking rates. Erosion would remain the same or increase slightly on wild horse herd management areas under Alternative 4, due to continuous use by wild horses.

Erosion would continue to be greater on the Sandy and Ashey soils and to a lesser extent, Basin Land and Terrace soils, than on the Volcanic, Very Shallow and Very Stony, Poorly Drained and Alkali Affected soils for the proposed action and all alternatives, although the total amount of erosion would be reduced.

Approximately 9.2 miles of streambanks under the proposed action and Alternative 4, 31.1 miles under Alternative 1, 16.4 miles under Alternative 3 and 1.7 miles under Alternative 5 would continue to erode at present rates on allotments with Federal range fenced, spring/summer, spring/fall, and deferred grazing systems.

On allotments with spring, rotation and rest rotation grazing systems, streambank erosion would decrease slightly on 44.1 miles under the proposed action and Alternative 4, 49.4 miles under Alternative 1, 63.9 miles under Alternative 3 and 3.7 miles under Alternative 5. These grazing systems would allow riparian vegetation to increase slowly and help stabilize streambanks.

The elimination of livestock grazing in Alternative 2 and the exclusion of livestock along 25.5 miles of perennial streams under the proposed action and Alternative 4, 15.2 miles under Alternative 1, 15.4 miles under Alternative 3 and 90.4 miles under Alternative 5 would greatly reduce streambank erosion. The expected increase in riparian vegetation along the protected streams would help stabilize the streambanks. Streambank erosion would also decrease along 16.9 miles proposed for restrictive use under the proposed action and on 6.5 miles presently inaccessible to livestock under the proposed action and all alternatives.

Range Improvements

The construction of range improvements under the proposed action and Alternatives 3, 4 and 5 would temporarily disturb the soil surface (see Table 3-3). The disturbance would subject those acres to wind and water erosion. This impact would lessen as the areas became revegetated in 1 to 2 years.

Livestock would concentrate around the proposed reservoirs, springs and waterholes. Approximately 5 acres around each of the proposed watering sites would be heavily grazed. Residual ground cover would thus decrease on 1,500 acres under the proposed action and Alternative 5, on 2,130 acres under Alternative 3, and on 1,290 acres under Alternative 4, thereby increasing erosion. Erosion would increase along some new fence lines due to trailing by livestock under the proposed action and Alternatives 3, 4 and 5.

Of the areas proposed for vegetation manipulation, erosion would not increase on the acres proposed for spraying. The dead vegetation would help protect the soil surface from erosion. Burning and chaining, however, would remove much of the existing vegetation and expose the soil to wind and water erosion. Wind erosion would occur to the greatest extent on Sandy and Ashey soils where burning is proposed. The allotments with the most acres affected would be Allotments 103, 512, 515, 516, 600, 705, 901 and 1001. Burning would occur on 5,760 acres of Sandy and Ashey soils under the proposed

Table 3-3 Soil Disturbance by Proposed Range Improvements [1/]

Range Improvements	Proposed Action				Alternative 3 Optimize Livestock				Alternative 4 Optimize Wild Horses				Alternative 5 Optimize Other			
			(Acres)				(Acres)				(Acres)				(Acres)	
	Units		Temp.	Perm.	Units		Temp.	Perm.	Units		Temp.	Perm.	Units		Temp.	Perm.
Fences	427.7	mi.	21.4	0	429.7	mi.	21.5	0	319.7	mi.	16.0	0	613.7	mi.	30.7	0
Springs	18	ea.	4.5	0	32	ea.	8.0	0	18	ea.	4.5	0	18	ea.	4.5	0
Wells	28	ea.	7.0	0	42	ea.	10.5	0	27	ea.	6.8	0	28	ea.	7.0	0
Pipelines	103.8	mi.	207.6	10.4	129.8	mi.	259.6	13.0	83.8	mi.	167.6	8.4	103.8	mi.	207.6	10.4
Guzzlers	71	ea.	7.1	0	71	ea.	7.1	0	71	ea.	7.1	0	71	ea.	7.1	0
Reservoirs	147	ea.	147	73.5	249	ea.	249	124.5	105	ea.	105	52.5	147	ea.	147	73.5
Waterholes	135	ea.	135	67.5	145	ea.	145	72.5	135	ea.	135	67.5	135	ea.	135	67.5
Spray/Seed	110,618	ac.	110,618	0	344,653	ac.	344,653	0	80,218	ac.	80,218	0	74,356	ac.	44,356	0
Burn/Seed	84,730	ac.	84,730	0	194,673	ac.	194,673	0	72,530	ac.	72,530	0	150,992	ac.	150,992	0
Chain/Seed	7,520	ac.	7,520	0	26,490	ac.	26,490	0	5,760	ac.	5,760	0	7,520	ac.	7,520	0
Brush Control/ Spray	33,320	ac.	0	0	778,560	ac.	0	0	11,320	ac.	0	0	0	ac.	0	0
Brush Control/ Burn	28,323	ac.	28,323	0	226,919	ac.	226,919	0	19,083	ac.	19,083	0	61,643	ac.	61,643	0
Brush Control/ Chain	105	ac.	105	0	210	ac.	210	0	105	ac.	105	0	105	ac.	105	0
Juniper Control	1,870	ac.	1,870	0	4,940	ac.	1,870	0	1,870	ac.	1,870	0	1,870	ac.	1,870	0
			233,695.6	151.4			795,515.7	210.0			180,008.0	128.4			297,024.9	151.4

1/ There would be no range improvements constructed under Alternatives 1 and 2.

action, 12,000 acres under Alternative 3, 3,560 acres under Alternative 4 and 10,560 acres under Alternative 5. The disturbed areas would be revegetated within 1 to 2 years. In the long term, erosion from vegetation manipulation would decrease due to the increase in vegetative ground cover.

No range improvements are proposed under Alternatives 1 and 2.

IMPACT ON WATER RESOURCES

Water Quantity

A number of studies (Rauzi and Hanson 1966; Alderfer and Robinson 1974; Hanson et al. 1972) have shown that heavily grazed areas and areas in poor range condition produce more runoff than lightly and moderately grazed areas and those in good range condition. However, most of these studies were done on the effects of grazing on runoff from rainfall. Most of the annual runoff on sagebrush watersheds, such as in the Lakeview EIS area, occurs during the snowmelt period (Sturges 1978), and thus occurs over frozen soils. Soil compaction by livestock, therefore, may not be important since the runoff is not controlled by the rate of infiltration of water into the soil. The decrease in grazing intensity and expected improvment in range condition under the proposed action and Alternatives 3, 4 and 5 is not expected to significantly affect runoff. Runoff is also not expected to change significantly under Alternative 1. Elimination of livestock grazing under Alternative 2 would lead to an increase in residual ground cover. An increase in cover causes an increase in surface roughness, and a reduction in the velocity of overland flow and detachment of soil. This would increase infiltration during rainfall, thus decreasing runoff slightly.

Less water would also reach downstream users due to the construction of reservoirs under the proposed action and Alternatives 3, 4 and 5. Since each reservoir would hold approximately 1.0 acre-feet (ac-ft) the total impoundment would be 147 ac-ft/year under the proposed action and Alternative 5, 249 ac-ft/year under Alternative 3 and 105 ac-ft/year under Alternative 4. The total impoundment would be less than 0.1 percent of the annual runoff from public lands in the EIS area. No reservoirs are proposed under Alternatives 1 and 2. Construction of waterholes would not affect downstream use since waterholes are built in dry lakebeds that are sinks for small internally-drained watersheds.

There are five wells proposed within the Fort Rock-Christmas Valley area. Significant quantities of ground water would not be withdrawn from these wells (approximately 35 ac-ft/year). The amount of groundwater withdrawn from the remaining proposed wells would not significantly impact the resource. No wells are proposed under Alternatives 1 and 2.

Water Quality

Chemical constituents are not likely to change since the chemical composition depends on the source of the water and the geological substrate. Most fecal coliform degradation of water quality from livestock comes from use in or

directly adjacent to streams (Johnson et al. 1978; Robbins 1978). Fencing 25.5 miles of streams in riparian areas under the proposed action and Alternative 4 and 90.4 miles under Alternative 5 would remove livestock concentration along perennial streams and thus decrease fecal coliform from livestock. Under Alternatives 1 and 3, fecal coliform levels would remain the same as the present situation. Under Alternative 2, fecal coliform from livestock would be eliminated.

The herbicide 2,4-D would be sprayed on 143,938 acres under the proposed action, 979,275 acres under Alternative 3, 91,538 acres under Alternative 4 and 44,356 acres under Alternative 5. Herbicides can enter streams by one or more of the following methods: leaching or subsurface flow of water, overland flow of water, direct application and drift on surface water (USDI, BLM 1978).

The herbicide 2,4-D is quickly adsorbed on the soil, so it is not readily available for leaching. Afterward, it is degraded quickly by microbial activity (Norris 1967 In USDI, BLM 1978). Also, less leaching would take place on loamy and clayey soils than on sandy soils. Sandy soils mostly occur in the northwest part of the EIS area, in an area with no perennial streams.

The herbicide could enter streams by overland flow of water if a heavy rain occurred soon after spraying. Abrahamson and Norris (1976) found that with buffer strips along streams in western Oregon, maximum herbicide concentrations in the water were less than 0.01 ppm with residues detected for less than one day after herbicide application. With a buffer strip 100 feet wide on both sides of perennial streams and around other water sources there would be a reduction in herbicide concentration in runoff water, which is filtered as it moves over uncontaminated soil, since soil adsorbs the chemicals.

In western Oregon, nearly all herbicides found in streams resulted from direct application of herbicides to the surface of water (USDI, BLM 1978). The buffer strips around the perennial streams and other water sources should prevent direct application or drift on to the streams. Most of the proposed projects are located further than 100 feet away from perennial streams.

No herbicides would be applied under Alternatives 1 and 2.

The construction of range improvements would temporarily increase the existing sediment yield by less than 2 percent under the proposed action and Alternatives 4 and 5, and by about 4.5 percent under Alternative 3. See Appendix P for methodology. The disturbed acres are expected to become revegetated within 1 to 2 years. After revegetation, sediment yields would return to the previous undisturbed levels or lower, since residual ground cover would increase. Reservoirs developed in alluvial soils (Soil Groupings Basin Land and Terrace, Alkali Affected) could increase erosion and sediment production because of these soils' erodible nature. Headcutting would occur below the proposed reservoirs due to increased slope of the spillway.

In the long term, the increase in residual ground cover from vegetation allocation, grazing systems and range improvements under the proposed action and Alternatives 3, 4 and 5 would decrease the sediment yield in the area. With the soil protected from erosion, less soil is detached and carried to streams resulting in an improvement in water quality. Under Alternative 2, residual ground cover would significantly increase, leading to larger reductions in sediment yield. Under Alternative 1, sediment yield would increase slightly within allotments that are presently overstocked.

The expected decrease in streambank erosion (see Impacts on Soils) would also reduce sediment yield in streams from bank sloughing. The anticipated increase in woody riparian vegetation would help shade streams and would lead to decreases in water temperatures along the shaded sections.

IMPACTS TO WILD HORSES

Vegetation Allocation and Grazing Systems

The proposed action and alternatives provide a vegetation allocation for the maximum number of adult horses (based on average populations of about 80 percent adults and 20 percent colts), as shown in Table 3-4.

Table 3-4 Vegetation Allocation to Wild Horses

Herd Management Plan Numbers 1/	Proposed Action	Alternatives				
		No. 1	No. 2	No. 3	No. 4	No. 5
Paisley Desert						
Minimum herd	60	60	60	20	350	20
Maximum herd	110	110	110	30	600	30
AUMs	1,020	0	1,020	360	7,200	360
Beatys Butte						
Minimum herd	100	100	100	20	1,000	20
Maximum herd	250	250	250	30	1,500	30
AUMs	2,400	0	2,400	360	18,000	360

1/ The horses in the Browns Valley area are proposed to be relocated within the Paisley Desert Herd Management Area under the Paisley Desert Herd Management Plan.

The allocation of forage to planned levels of horses (except in Alternative 1) would decrease forage competition between horses and livestock under the proposed action and Alternatives 3 and 5. The health and reproductive capacity of the horses would be maintained or improved since adequate forage would be allocated to the horses. Under Alternative 1, forage competition would continue. In Alternative 4, eliminating livestock grazing and the associated management activities would remove a major source of forage competition and disturbance. Periodic removal of horses to maintain optimum numbers would cause disturbances under the proposed action and all

alternatives. Based on observations of past reductions of the herds and subsequent rates of reproduction, the herd populations would be expected to remain viable.

The proposed grazing systems in the proposed action and Alternatives 3 and 5 would cause about the same amount of disturbance from livestock operators moving livestock as presently occurs under the existing grazing systems (which would continue under Alternative 1). Grazing systems would not be in effect under Alternatives 2 and 4.

Range Improvements

The design, construction and maintenance of range improvements under the proposed action and Alternatives 3 and 5 would result in more people being in the herd areas, temporarily disturbing the wild horses with increased activity and noise. The 42 reservoirs proposed to be constructed in the Beatys Butte herd area would be available to horses year-long and thus open up areas of forage previously unavailable to horses because of long distances from water. The 108 miles of fence to be constructed could cause injuries to horses until the horses became accustomed to fence locations. The vegetative manipulation projects would tend to attract horses, due to the abundance of forage available.

No range improvements would be constructed in the herd management areas under Alternatives 1 and 2. Under Alternative 4, 11 miles of fence with let-down sections would be constructed in the Beatys Butte herd area in order to rotate horses between three use areas.

IMPACTS ON WILDLIFE

Impact analysis was based primarily on three considerations:

1. Condition and trend of habitat as based on visual observation of district personnel and limited habitat inventory.
2. Potential of wildlife habitat to respond to a specific grazing system.
3. Predicted impacts to vegetation as they affect wildlife.

Wildlife populations have not been monitored to determine the impact of past grazing systems and range improvements; therefore, predictions of population changes are based on field observations and research. Impacts on wildlife are summarized in Table 1-5.

An environmental change which reduces population size or carrying capacity is an adverse impact to that species. Similarily, an environmental change which increases populations or carrying capacity results in a beneficial impact. An action which increases habitat diversity in an area would also increase the numbers and kinds of wildlife. This analysis places emphasis on animals and their habitats which would be significantly impacted.

Wildlife would experience both primary and secondary impacts. Primary impacts affect wildlife populations directly. Some examples of primary

impacts are: avoidance of livestock by big game; deer and antelope fence mortalities; nest disturbance or destruction from livestock trampling; animal displacement from burning and seeding. Most primary impacts are not discussed because they are believed to be insignificant in the long term. Although individuals are lost, population trends are unaffected.

Secondary impacts affect wildlife populations indirectly by changing the vegetation or wildlife habitat. Some examples are: loss of sagebrush cover from herbicide spraying; increased nesting trees in riparian zones; siltation of stream bottoms from exposed banks. These secondary impacts to wildlife habitat have been found to be significant. Without the required habitat for reproduction or for protection during severe winter weather, wildlife populations will quickly decline.

Impacts to wildlife habitat are discussed first, followed by a conclusion which estimates expected changes to wildlife populations.

Wildlife Habitat in Riparian Areas and Wetlands

Impacts in riparian areas and wetlands are significant because these areas contain the greatest densities and varieties of species (Thomas et al. 1979). Grazing systems, livestock exclusion and restrictive use would affect about 590 public riparian acres along 96 miles of stream (Table 3-5). Approximately 12,700 acres of crucial wetland habitat at lakes and reservoirs would be affected. (Table 3-6).

Impact predictions were made by comparing existing grazing, condition and trend with proposed grazing at each riparian stream segment and each wetland (Figure 2-2). Results from these site specific analyses were totaled to indicate long-term condition and trend of riparian and wetland wildlife habitats (Table 3-7 and 3-8).

Future conditions classes were not estimated for wetlands because the areas have not been surveyed to determine existing condition. However, future trend can be estimated even though existing trend data are not available. For example, livestock grazing is presently degrading wildlife habitat at Greaser Reservoir. Elimination of grazing in Alternative 2 would allow wildlife habitat to improve, resulting in an upward trend.

Condition of wildlife habitat in riparian areas and wetlands is closely related to range condition; however, there are differences. Structure or the physical arrangement of vegetation is important to wildlife. For example, grass along a stream may be in good range condition but still be poor nesting habitat because the grass has been grazed to ground level.

Grazing Systems

Reductions in livestock numbers normally do not improve riparian areas or wetlands because riparian vegetation is often severely grazed before light use is made of upland vegetation. Grazing systems and the period of use are the most important factors with riparian areas.

Exclusion of grazing would result in rapid improvement of wildlife habitat (Winegar 1977). Livestock exclusion and seeding along Willow Creek in Allotment 404 has resulted in an upward trend and greatly improved wildlife habitat condition (see Chapter 2, Wildlife--photos). Riparian areas with a high potential for improvement would be expected to improve two condition classes.

Restrictive use would result in rapid improvement of wildlife habitat during the exclusion phase. Subsequent grazing at proposed utilization levels would maintain improved habitat as compared to the existing situation. Improved vegetative composition in riparian areas would improve wildlife habitat at least one condition class. An upward trend in wetland habitat can be expected. Watergaps, provided by the proposed action and alternatives, would receive heavy livestock use, resulting in poor wildlife habitat at these locations.

Under rest rotation, increased cover during the rest year is often lost with livestock use the following years. Depending on their potential, some riparian areas would improve while others would remain in their present condition. Area wide, a slow upward trend can be expected. Photo trend plots for the existing rest rotation system show static conditions in a riparian area (Allotment 202) and improved vigor and species composition in a wetland (Allotment 215).

The spring and rotation grazing systems would result in an upward trend of wildlife habitat. Livestock are less likely to concentrate along streams early in spring because of abundant green growth in the uplands and low air temperatures. Utilization of woody species (willow, chokecherry, rose, etc.) by livestock would be light. Sufficient regrowth would occur each year to establish an upward trend.

Deferred grazing would concentrate livestock in riparian areas each year in late summer. The spring/summer system would result in heavy livestock utilization during the growing season each year. Wildlife habitat would deteriorate with both of these systems.

While winter grazing would allow maximum summer growth of herbaceous vegetation, it would reduce herbaceous cover for spring nesting. Habitat trend in wetlands would be static.

Range Improvements

Development of springs would initially destroy some wildlife habitat in riparian areas at each spring site. About 0.1 acre at each site would be affected. Where fencing of overflows is proposed, lost habitat would be replaced in the long term. Proposed waterholes and reservoirs would increase wetland habitat by about 2 acres at each site. The number of spring developments, reservoirs and waterholes for the proposed action and alternatives are listed in Table 1-1.

Table 3-5 Public Acres (miles) of Wildlife Habitat in Riparian Areas which would be Affected by the Proposed Action or Alternatives

Type of Grazing or Management	Proposed Action		Alt. 1 No Action		Alt. 2 Eliminate Livestock		Alt. 3 Optimize Livestock		Alt. 4 Optimize Wild Horses		Alt. 5 Optimize Other	
Exclude Livestock	129	(26)	76	(15)	659	(96)	78	(15)	129	(26)	565	(90)
Restrictive Use	80	(17)	0	(0)	0	(0)	0	(0)	80	(17)	0	(0)
Spring/Summer	2	(1)	132	(18)	0	(0)	3	(1)	2	(1)	2	(1)
Rest Rotation	352	(40)	321	(48)	0	(0)	418	(59)	352	(40)	90	(4)
Deferred	89	(8)	94	(10)	0	(0)	121	(12)	89	(8)	2	(1)
Spring/Fall	0	(0)	33	(3)	0	(0)	29	(3)	0	(0)	0	(0)
Rotation	7	(4)	0	(0)	0	(0)	7	(4)	7	(4)	0	(0)
Spring	0	(0)	3	(2)	0	(0)	3	(2)	0	(0)	0	(0)
Federal Range Fenced	2	(1)	2	(1)	2	(1)	2	(1)	2	(1)	2	(1)
Inaccessible to Livestock	15	(6)	15	(6)	15	(6)	15	(6)	15	(6)	15	(6)
Unallotted	18	(3)	18	(3)	18	(3)	18	(3)	18	(3)	18	(3)
Totals	694	(106)	694	(106)	694	(106)	694	(106)	694	(106)	694	(106)

Table 3-7 Public Acres (miles) of Wildlife Habitat in Riparian Areas-- Expected Long-Term Condition and Trend

Condition	Existing Situation		Proposed Action		Alt. 1 No Action		Alt. 2 Eliminate Livestock		Alt. 3 Optimize Livestock		Alt. 4 Optimize Wild Horses		Alt. 5 Optimize Other	
	Ac.	(Mi.)	Ac.	(Mi.)	Ac.	(Mi.)	Ac.	(Mi.)	Ac.	(Mi.)	Ac.	(Mi.)	Ac.	(Mi.)
Excellent	0	(0)	0	(0)	0	(0)	5	(1)	0	(0)	0	(0)	5	(1)
Good	28	(4)	234	(46)	104	(19)	668	(94)	104	(20)	234	(46)	559	(86)
Fair	163	(34)	190	(27)	222	(31)	13	(7)	223	(32)	190	(27)	30	(10)
Poor	115	(16)	82	(14)	111	(19)	0	(0)	111	(18)	82	(14)	2	(1)
Unknown 2/	388	(52)	188	(19)	257	(37)	8	(4)	256	(36)	188	(19)	98	(8)
Total	694	(106)	694	(106)	694	(106)	694	(106)	694	(106)	694	(106)	694	(106)
Trend														
Up	1/		521	(72)	303	(36)	686	(102)	417	(50)	521	(72)	654	(94)
Static	1/		83	(24)	172	(37)	8	(4)	133	(36)	83	(24)	32	(9)
Down	1/		12	(4)	110	(20)	0	(0)	25	(5)	12	(4)	8	(3)
Unknown 2/	694	(106)	78	(6)	109	(13)	0	(0)	119	(15)	78	(6)	0	(0)
Total	694	(106)	694	(106)	694	(106)	694	(106)	694	(106)	694	(106)	694	(106)

1/ Existing trend is unknown.

2/ Acres in the unknown category are different with each alternative because acres excluded from livestock varies with each alternative. The assuption was made that livestock exclusion would result in good wildlife habitat with upward trend even though existing condition and trend is unknown.

Table 3-6 Public Acres of Wildlife Habitat in Wetlands which would be Affected by the Proposed Action or Alternatives

Type of Grazing or Management	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Exclude Livestock	784	745	12,516	745	785	9,330
Restrictive Use	855	0	0	0	855	0
Spring/Summer	317	7,901	0	319	317	319
Rest Rotation	9,122	2,235	0	9,935	9,122	1,760
Deferred Rotation	180	260	0	260	180	0
Deferred	242	300	0	242	242	122
Winter	750	750	0	750	750	720
Spring/Fall	0	60	0	0	0	0
Federal Range Fenced	265	265	0	265	265	265
Unallotted	180	180	180	180	180	180
Total	12,696	12,696	12,696	12,696	12,696	12,696

Table 3-8 Public Acres of Wildlife Habitat in Wetlands--Expected Trend

Trend	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Up	8,670	715	11,015	7,945	8,670	9,400
Static	2,142	9,332	470	2,182	2,142	1,432
Down	0	0	0	0	0	0
Unknown 1/	1,884	2,649	1,211	2,569	1,884	1,864
Totals	12,696	12,696	12,696	12,696	12,696	12,696

1/ Acres in the unknown category are different with each alternative because acres excluded from livestock varies with each alternative. The assuption was made that livestock exclusion would result in upward trend even though existing trend is unknown.

Conclusion

Alternatives 2 and 5 would improve almost all riparian areas and wetlands through livestock exclusion. The proposed action and Alternative 4 would improve about 70 percent of the riparian areas and wetlands, primarily with livestock exclusion and restrictive use. Alternative 3 would slightly improve about 60 percent of the riparian areas and wetlands primarily with rest rotation grazing. Alternative 1 would provide the least riparian protection. Recently implemented exclosures and grazing systems would improve 38 percent of the riparian areas and 6 percent of the wetlands.

Mule Deer and Antelope

Trend of crucial big game range was predicted by considering grazing system, season of use, changes in livestock allocation and range improvement projects. Acres of winter range in each allotment or pasture were analyzed separately. The results were tabulated in Tables 3-9 and 3-10.

Table 3-9 Deer Crucial Winter Range - Expected Trend

	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Up	79,200	14,200	13,500	23,100	79,200	89,600
Static	200,500	262,200	49,900	102,700	200,500	190,800
Down	17,400	20,700	233,700	171,300	17,400	16,700
Unknown	7,900	7,900	7,900	7,900	7,900	7,900
	305,000	305,000	305,000	305,000	305,000	305,000

Table 3-10 Antelope Crucial Range - Expected Trend

	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Up	78,700	7,500	0	78,700	33,700	78,700
Static	13,000	84,200	0	13,000	13,000	13,000
Down	5,000	5,000	51,700	5,000	50,000	5,000
Unknown	0	0	45,000	0	0	0
	96,700	96,700	96,700	96,700	96,700	96,700

Grazing Systems and Vegetation Allocation

Initial livestock decreases (Appendix B, Table B-1) provide more forage for big game, a beneficial impact. Several studies have shown that prescribed livestock grazing during certain seasons is beneficial to big game (Andersen

1975, Leckenby et al. 1980, Tueller 1979, Urness 1966). Elimination of livestock grazing, however, would decrease forage for deer and antelope because of decreased availability of nutritious young grasses and reduced productivity of browse. Portions of the crucial deer winter range are now dominated by annuals. In Alternative 5, elimination of grazing would increase perennial grass forage for deer in these areas.

Turn-out dates prior to mid-April would result in competition between livestock and big game for the spring greenup of grasses (Appendix B, Table B-1). Rest rotation, rotation and deferred rotation would rotate early turnout dates among two to four pastures; therefore, competition would not occur in every pasture each year.

Spring, spring/fall and spring/summer systems would result in forage competition each year in the same pasture. Total pounds of forage produced with the spring/summer system would decrease. Relatively small pastures and a variety of grazing treatments (proposed action, Alternatives 1, 3, 4 and 5) would prevent large blocks of continuous habitat (greater than 3,000 acres) from being adversely affected in any one year.

Rest rotation grazing would increase forage production for big game. Observations by district personnel and photo studies indicate improved bitterbrush vigor with rest rotation systems.

Range Improvements

Under the proposed action and Alternatives 4 and 5, sagebrush control and seedings would increase habitat diversity for wide-ranging big game animals by introducing herbaceous food within monotypic stands of sagebrush. Greatest habitat diversity would result from burning which would create the most edge between sagebrush cover and herbaceous food. Forbs, an important food source, would be increased with burning and decreased with herbicide spraying. In Alternative 3, sagebrush control would decrease cover on large blocks of winter range (Table 3-11, Figures 1-1, 2-5). Juniper chaining and subsequent seeding improve habitat for big game by increasing forage.

Table 3-11 Acres of Crucial Big Game Range Affected by Vegetation Manipulation

	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Crucial Deer Range	10,300	0	0	98,000	10,300	10,300
Crucial Antelope Range	9,300	0	0	46,800	900	9,300

New water sources would reduce forage competition with livestock near existing waters and increase big game distribution. Some forage competition could result from livestock grazing in areas previously used primarily by big game. In seedings, improved distribution of livestock with water developments would increase desirable green up of vegetation for deer and antelope. The proposed 400 miles of fence to be built primarily on upland sites is not expected to have a significant impact. A minor number of mortalities may occur, especially immediately after construction. Existing fences on public lands in the EIS area have not had a significant adverse impact to big game.

Conclusion

Deer population trend is the net effect of all interacting habitat components on all portions of the annual range. No population trend can be predicted since no single cause and effect correlation between deer habitat and population trend can be shown. However, mule deer populations are not expected to change significantly as a result of the proposed action or any alternatives. Expected improvement in habitat under the proposed action and Alternatives 4 and 5 could support slight population increases should they occur.

Antelope populations are expected to increase with the proposed action and Alternatives 3 and 5. Sagebrush control would convert dense stands of big sagebrush to low-growing herbaceous types preferred by antelope. Alternatives 1, 2 and 4 would maintain existing populations.

Bighorn Sheep

The proposed action and alternatives would not affect bighorn sheep populations. There are no significant conflicts between livestock and the existing small number of sheep. Exclusion of livestock from bighorn sheep range in Alternatives 2 and 5 would prevent potential forage conflicts if sheep populations were to increase greatly (Figure 2-5).

Water-Associated Birds

Livestock grazing in wetland habitat affects water-associated birds. Grazing can reduce nesting success by removing the required herbaceous residual cover. Nesting success can also be reduced by trampling or disturbance. Food plants such as smartweed and sedge are often grazed before they can be utilized by birds. Livestock trampling causes compaction and loss of vegetation which reduces food and cover for birds. The acres of wetland habitat affected by various grazing systems and resulting habitat trend are shown in Tables 3-6 and 3-8.

Grazing Systems

Exclusion of livestock would greatly improve nesting success in wetlands such as at Greaser Reservoir and Twenty Mile Slough. Restrictive use would greatly increase bird production during the initial livestock exclusion phase. When grazing is resumed, bird production would decrease but would remain higher than existing levels.

The rest treatment of rest rotation systems would provide good nesting cover the following spring. Grazed pastures in rest rotation systems would result in poor nesting cover and food. The spring and rotation grazing systems, which allow for regrowth of vegetation, would improve habitat. Deferred, winter, spring/fall and deferred rotation would result in very low bird production because of heavy utilization of vegetation in wetlands. Spring/summer grazing would change plant composition to species less desirable for most birds.

Livestock grazing in the Warner Valley potholes (Allotment 523) does not significantly affect bird production. The amount of spring runoff is more of a limiting factor than livestock. During low water years, bird use is low regardless of previous grazing.

Range Improvements

Proposed waterholes and reservoirs would increase wetland habitat by about 2 acres at each site (Table 1-1). Bird distribution would be increased.

Conclusion

Alternatives 2 and 5 would improve almost all nesting habitat on public lands; greatly increased nesting success can be expected. Under the proposed action and Alternative 4, about 70 percent of the wetlands would be improved. Moderately increased bird production can be expected. In Alternative 3, grazing systems would be used to improve wetlands. Slightly increased bird production can be expected. In Alternative 1, no improvement is expected on 74 percent of the wetlands. The existing low level of bird production would continue.

Other Mammals, Upland Game Birds, Other Birds, Amphibians and Reptiles

These animals are grouped to avoid repetition. Impacts are described in general terms and covering very broad areas; detailed analysis is not possible because site specific or species specific impacts from existing or proposed livestock management are largely unknown. Livestock grazing affects these species primarily through changes in condition of riparian areas and wetlands (see Wildlife Habitat in Riparian Areas and Wetlands, above), amount of residual ground cover in upland areas and vegetative composition. Residual ground cover includes dried herbaceous vegetation which persists through winter and spring. In all areas, this cover is very important for reproduction, escape from predators and maintenance of body temperatures. Long term, subtle changes in vegetative composition would improve habitat for some species and have adverse impacts on others (Egeline 1978).

Grazing Systems

Livestock exclusion and restrictive use would improve riparian habitat to at least good condition (Table 3-5 and 3-7). Winter cover, nesting cover and food would be increased. Increased shrub and tree growth in riparian areas

would allow birds to nest in previously unoccupied areas. Species such as valley quail, spotted frog and beaver, which are strongly associated with riparian areas, would be greatly benefited. Species such as chukar partridge and sage grouse, which do not require dense riparian vegetation, would benefit only slightly. Studies at the Willow Creek exclosures (Allotment 404) have shown greater bird species diversity and total numbers in protected riparian habitat as compared to adjacent grazed habitat.

In upland areas, exclusion and restrictive use would increase residual cover and food. Each year, ungrazed grasses and forbs would mature and produce seeds used by many species. Long-term changes in vegetative composition would favor species such as the least chipmunk and cottontail which are benefited by ungrazed conditions. Some species, such as black-tailed jackrabbits, may decrease as disturbed areas now dominated by annuals are replaced with ungrazed perennial grasses.

Grazing systems which increase perennial grass vigor would improve nesting cover for ground nesters such as horned larks. Rested pastures in rest rotation systems would have the greatest amount of residual vegetation for thermal cover and nesting. Grazing treatments during the following 2 or 3 years would result in decreased cover. The spring/summer system, which allows grazing during the critical part of the growing season each year, would result in very low amounts of residual cover. Decreased vigor of perennial grasses would also decrease cover. Remaining systems are not expected to have significant impacts.

Range Improvements

Range improvements by alternative are summarized in Table 1-1. Vegetation manipulation has immediate and often adverse impacts because of dramatic changes in vegetative composition. Removal of sagebrush through herbicide spraying, chaining or burning would have a severe adverse impact on animals which are dependent on sagebrush for food and cover (e.g., sage grouse, black-tailed jackrabbit). Decreased sagebrush would be adverse to brush-nesters such as sage sparrows and mammals such as the pygmy rabbit (Olterman and Verts 1972). Loss of thermal cover would be adverse to reptiles such as horned lizards and leopard lizards (Storm 1966). Grassland species such as horned larks and ground squirrels would increase along with predators such as ferruginous hawks.

Sagebrush control, while increasing edge effect, decreases habitat diversity for animals with small home ranges. The number of different kinds of animals in the treated areas would decrease. Untreated or leave patches would not entirely offset losses of food and cover.

The herbicide 2,4-D is not expected to have direct impacts on wildlife. When used as manufacturer's label prescribes, 2,4-D has not been reported to be poisonous to wildlife. In a worst case situation, drift may result in important food and cover patches being sprayed. Besides killing sagebrush, 2,4-D would also reduce perennial forbs which are an important wildlife food source.

In the short term, burning would moderately reduce populations. Some animals would be killed during the fire; others would be displaced to areas where they could not compete with the existing populations. Burning would benefit wildlife by creating a significant amount of edges. More herbaceous food would be available adjacent to sagebrush cover.

Chaining would have adverse impacts on wildlife because of the severe disturbance to soil and vegetation. Small mammal burrows and bird nest sites in shrubs and trees would be destroyed. Chaining would permit good control of leave patches. Important food and cover can be precisely located and easily avoided.

Juniper chaining, burning or cutting would be beneficial to some species and adverse to others. Decreased juniper would be adverse to tree nesters such as pinyon jay and Clark's nutcracker. Increased grass and shrubs would be beneficial to species such as the meadow lark, sage sparrow and deer mouse. Numbers and kinds of small animal species would be expected to increase.

Seedings which are dominated by crested wheatgrass would greatly decrease habitat diversity. Although mixtures of grasses, shrubs and trees are planted, crested wheatgrass is often the only plant species that survives. Reynolds and Trost (1978) found that crested wheatgrass plantings, regardless of livestock use, supported fewer nesting bird species and a lower density of birds, mammals and reptiles than did areas dominated by sagebrush. Nesting birds were reduced to a single species, the horned lark. Similar impacts can be expected in the EIS area. Seedings which establish forbs, shrubs and trees in addition to crested wheatgrass would have greater habitat diversity (Appendix B, Table B-3) than a seeding composed primarily of crested wheatgrass.

Wells, springs and pipelines would increase seasonal distribution of animals, primarily birds, which are able to drink from livestock troughs. Occasional drownings of small birds and mammals would occur in troughs despite escape ramps. Guzzlers would increase distribution for birds, primarily sage grouse and chukar partridge.

Increased sources of water provided by new reservoirs would increase distribution and numbers of species such as the mountain cottontail, Brewer's blackbird and spotted frog. Full potential of new reservoirs would not be realized because there would be no protection of vegetation at the water's edge during grazing seasons.

Conclusions

Impacts to populations are compared in Table 3-12. Overall impacts on populations within the entire EIS area would be low to moderate. Some species would increase or decrease slightly depending on the alternative and degree of habitat modification. Localized impacts could be more pronounced. Vegetation manipulation would greatly reduce bird, mammal and reptile populations on 7 percent (Alternative 4), 11 percent (proposed action, Alternative 5) or 55 percent (Alternative 3) of the big and low sagebrush vegetation

type. (Approximately 73 percent of the EIS area is in these two vegetative types.) Bird and mammal populations can be expected to increase greatly along streams and wetlands excluded from livestock grazing (proposed action, Alternatives 2 and 5) and amphibian populations would increase slightly due to this protection.

Table 3-12 Summary of Impacts to Small Animal Populations

Animal Group	Proposed Action	No Action Alt. 1	Elim. Lvstk. Alt. 2	Opt. Lvstk. Alt. 3	Opt. Wild Horse Alt. 4	Opt. Other Alt. 5
Mammals	-L	NC	+M	-H	-L	-L
Upland Game Birds	+L	NC	+L	-M	+L	+L
Other Birds	-L	NC	+M	-H	-L	-L
Amphibians	+L	NC	+M	+L	+L	+M
Reptiles	-L	NC	+M	-H	-L	-L

Note: Increase is shown by +, Decrease by -, NC = No change from existing situation. Insufficient data prevent quantification. Anticipated changes are expressed using Low (L), Medium (M) and High (H).

Fish

Fish would be affected primarily through changes in streambed sedimentation, bank stability and riparian vegetation. Impact predictions were made by comparing existing grazing and fish habitat condition with proposed grazing management at each stream segment (Table 3-13, 2-8).

Results from these site specific analyses indicate long term condition and trend of stream habitat (Table 3-14). Reservoirs would continue in poor condition as a result of fluctuating water levels for irrigation. Grazing along reservoir shorelines does not limit fish production.

Grazing Systems

Livestock exclusion and restrictive use would improve fish habitat at least one condition class where livestock grazing has been limiting fish production (Table 3-13). Excluding livestock from damaged stream areas is a proven management technique to increase fish production. Successful streambank fencing projects have been documented in Oregon (Winegar 1977), Utah (Duff 1978) and elsewhere. Within the EIS area, livestock exclusion has improved willow growth along Willow Creek (Allotment 404). Beneficial effects of improved riparian vegetation include reduced water temperatures, reduced silt and increased summer flows. Dense riparian vegetation stabilizes the stream banks and provides cover and food for fish. Subsequent livestock use in restrictive use areas would maintain improved fish habitat. Increased vegetative cover on watersheds with Alternative 2 would decrease sediments, a beneficial impact to fish.

Table 3-13 Public Stream Miles of Fish Habitat which would be Affected by the Proposed Action or Alternatives

Type of Grazing or Management	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Exclude Livestock	22.0	13.0	56.0	13.0	22.0	53.0
Restrictive Use	8.5	0	0	0	8.5	0
Spring/Summer	.5	5.0	0	.5	.5	.5
Rest Rotation	15.5	25.5	0	27.5	15.5	3.0
Deferred	5.5	7.5	0	7.0	5.5	.5
Spring/Fall	0	2.5	0	2.5	0	0
Rotation	3.0	0	0	3.0	3.0	0
Spring	0	1.5	0	1.5	0	0
Fenced Range Federal	1.0	1.0	0	1.0	1.0	1.0
Inaccessible to Livestock	6.0	6.0	6.0	6.0	6.0	6.0
Unallottted	3.0	3.0	3.0	3.0	3.0	1.0
Total	65.0	65.0	65.0	65.0	65.0	65.0

Table 3-14 Public Stream Miles of Fish Habitat-- Estimated Condition and Trend

Condition	Existing Situation	Proposed Action	Alt. 1 No Action	Alt. 2 Eliminate Livestock	Alt. 3 Optimize Livestock	Alt. 4 Optimize Wild Horses	Alt. 5 Optimize Other
Excellent	3.0	5.5	3.0	6.0	5.5	5.5	5.5
Good	12.5	20.0	16.0	31.0	13.5	20.0	29.5
Fair	16.5	16.0	15.0	12.5	15.5	16.0	11.5
Poor	18.5	10.5	13.0	5.5	12.5	10.5	8.0
Unknown 1/	14.5	13.0	18.0	10.0	18.0	13.0	10.5
Total	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Trend							
Up	9.0	29.0	16.0	47.0	16.0	29.0	43.5
Static	17.5	29.0	30.0	18.0	31.0	29.0	18.5
Down	1.0	2.0	6.0	0	2.0	2.0	1.5
Unknown 1/	37.5	5.0	13.0	0	16.0	5.0	1.5
Total	65.0	65.0	65.0	65.0	65.0	65.0	65.0

1/ Acres in the unknown category are different with each alternative because acres excluded from livestock varies with each alternative. The assumption was made that livestock exclusion would result in at least good condition and upward trend.

Rest rotation, spring and rotation grazing would at least maintain existing fish habitat. Deferred, and spring/summer would concentrate livestock in riparian areas during all or most of the summer; therefore, a downward trend can be expected. Systems which significantly increase vegetative cover on watersheds would benefit fish by decreasing sediments.

Conclusions

Alternatives 2 and 5 would increase fish production in perennial streams because of improved vegetative cover in riparian areas and surrounding watersheds. The proposed action and Alternative 4 would moderately increase fish production on 23 stream miles protected from livestock. Alternatives 1 and 3 would increase fish production on 13 stream miles recently excluded from livestock.

Threatened, Endangered and Sensitive Species

The proposed action and alternatives are not expected to affect nesting bald eagles or suspected nesting activity by peregrine falcons. Changes in small mammal populations and vegetation would not be great enough to affect kit fox habitat. Impacts to nesting snowy plovers are not expected. On public lands, the lake playas and dunes used by snowy plovers receive light or no livestock use.

About 14 public stream miles of Warner sucker habitat has recently been excluded from grazing. Alternative 2 would exclude grazing from an additional 2 miles of sucker habitat. Beneficial effects of resulting improved riparian vegetation are described in the fish section. The proposed action and alternatives would maintain or possibly increase existing populations. Adverse impacts from irrigation would not be changed by the proposed action or alternatives.

Although Foskett Springs is on private land, BLM licensed cattle on surrounding public land have access to the spring. It is not known whether existing grazing is beneficial or harmful to dace at Foskett Springs. The small population of dace found on public land would not be impacted since the area would remain excluded from livestock under all alternatives.

No impacts are expected to the Hutton Springs Tui chub. Its habitat is on private land entirely fenced from surrounding public land.

IMPACTS ON RECREATION

Vegetation Allocation and Grazing Systems

Alteration of the recreational experience for certain activities can occur as a result of grazing management activities. Beneficial and adverse impacts are quantifiable in terms of expected visitor use changes. Research by Meganck and Gibbs (1979) and Downing and Clark (1979) suggests that few recreationists are disturbed by livestock grazing, as long as deer habitat, vehicle access and site integrity are not impaired.

Hunting and wildlife sightseeing visitor use would be expected to change in relation to impacts on the species sought. Impacts to wildlife (q.v.) identifies those impacts to big game, upland game and waterfowl under the proposed action and alternatives which would subsequently create impacts to visitor use. Further, livestock exclusions and riparian habitat protection inherent in the proposed action and Alternatives 2, 4 and 5 would enhance fishing, waterfowl and upland game hunting in some areas. Elsewhere, fences would impede access for some recreationists. The resultant long-term impact would be more one of annoyance to recreationists, causing slight localized reductions or relocation of visitor use in some activities such as fishing, hunting and sightseeing.

Impacts to general sightseeing are related to the effects on scenic quality (see Impacts on Visual Resources). Under Alternative 1, visitor use projections would not be impacted. The elimination of grazing (Alternative 2) would result in enhanced sightseeing opportunities. Under the proposed action and Alternatives 3, 4 and 5, visual contrasts between grazed and rested pastures would cause short-term visitor use reductions in most activities due to the degradation of scenic quality and recreational experience. In the long term, sightseeing opportunities and recreational experience would be enhanced as forage abundance and quality improve.

Range Improvements

Site-specific adverse impacts within certain recreation activity areas would occur as a result of range improvement projects which impair access, site integrity and/or the recreational experience. Vegetation manipulation projects and fencing have the potential to create the most significant adverse impacts. Elsewhere, fencing would stabilize streambanks and improve fishing. Water developments would attract wildlife and enhance hunting and sightseeing opportunities. Table 3-15 summarizes, for the proposed action and alternatives, the significant beneficial and adverse impacts to localized visitor use in high quality recreation opportunity areas.

Alternatives 1 and 2 would result in no impacts as no new range improvements are proposed. Under the proposed action and Alternatives 3, 4 and 5, the cross country use of motor vehicles during the construction and maintenance of some range improvement projects would create unimproved trails and tracks. Improved access for dispersed recreation use would result. These trails and tracks may also create adverse impacts to those recreationists who perceive them as degradatory to natural and pristine rangeland conditions.

Within the Lakeview EIS area, numerous other areas were rated as having moderate quality recreation opportunities. In some cases, the implementation of range improvements may cause degradation of the present recreation experience in these areas. For example, under the proposed action and Alternatives 3, 4 and 5, impacts may occur in moderate-quality recreation activites and areas such as deer hunting in the Silver Lake-Fort Rock area, rock collecting in the Sunstone area, zoologic sightseeing at Flagstaff Lake, botanic sightseeing in the Drakes/Colvin area and historic sightseeing as shown in Table 3-16.

Table 3-15 Impacts to High Quality Recreation Opportunity Areas

Recreation Activity	Quality Rating Area	Quality Rating	Potential Impactor	Allotment/s	Degree of Impact to 1/ Localized Visitor Use	Impact Occurrence (by Alternative)
Hunting (big game)	Hbg-276, Coyote/Colvin/Fish Creeks	13/A	Numerous	502, 503, 517, 518, 519, 520	-L	PA, 3, 4, 5
Hunting (upland game)	Hug-279, Drakes/Colvin	13/A	Numerous	501, 519, 520, 521, 524	-L	PA, 3, 4, 5
Hunting (waterfowl)	Hwf-278, Warner Lakes	12/A	Spray and seed (2,400 acres); fencing (5 miles)	523	-L	PA, 3, 4, 5
			8 reservoirs	523	+L	3
			Fencing (12 miles)	523	-L	5
Hang Gliding	Ohg-211, Doughtery Slide	30/A	Burn and seed (1,800 acres); spray (1,800 acres)	600	0	PA, 3, 4, 5
Hiking and Horseback Riding	Ohb-178, Fish Creek Rim	20/A	Burn (1,200 acres) adjacent	202, 520	-L	PA, 3, 4, 5
			Extensive spraying adjacent	201, 202, 208, 520	-L	3
	Ohb-273, Abert Rim	23/A	Spring development	518	+L	PA, 3, 4, 5
Sightseeing (zoologic)	Szo-203, Sagehen	20/A	Numerous	600	-M	PA, 3, 4, 5
	Szo-365, Aspen Lake	23/A	Water development	822	+L	PA, 3, 4, 5
	Szo-364, Miller Cr. Canyon	21/A	2 water developments; Burn (100 acres)	884, 885	+L	PA, 3, 4, 5
Sightseeing (historic) 2/						

1/ Key: L = Low M = Moderate + = beneficial - = adverse

2/ See Table 3-19, summarizing potential impacts on historic sites, for a listing of potential impacts to both high and moderate quality historic sightseeing areas. A slight reduction in visitor use would occur in those areas.

Conclusion

Estimated 1990 recreational visitation with the proposed action and all alternatives is shown in Table 3-16.

Implementation of Alternative 1 would have no effect on long-term projected visitor use. Alternative 2 would result in visitor use increases in most activities. Under the proposed action and Alternatives 3, 4 and 5, recreational use reductions or increases associated with certain activities would occur in specific localities.

Table 3-16 Estimated Recreational Visitation - 1990
Visitor Days/Year

Recreational Activity	Proposed Action BLM	Alt. 1 Total 2/	Alt. 1 1/ BLM	Alt. 2 BLM	Alt. 3 BLM	Alt. 4 BLM	Alt. 5 BLM
Hunting	24,640	95,272	24,396	24,640	23,830	24,520	24,740
Fishing	11,710	No Data	9,764	12,300	9,760	11,710	12,010
General Sightseeing	6,990	123,698	7,354	7,720	6,250	6,990	6,990
Other 3/	36,790	476,365	38,723	40,660	32,910	36,790	36,790
Total	80,130	695,335	80,237	85,320	72,750	80,010	80,530

1/ Estimated 1990 visitor use under a continuation of the existing situation is based upon projections shown in Table 2-9.
2/ Represents 1990 total area-wide use for the Lakeview EIS area and includes use on public as well as other lands.
3/ Includes additional activities shown in Table 2-9.

Source: Derived from Bureau planning documents, visitor use projections and professional estimates.

IMPACTS ON CULTURAL RESOURCES

Impacts on cultural resources as caused by livestock trampling have been documented by Roney (1977), Logsdon (1976) and Haggarty and Flenniken (1977). Trampling adversely affects cultural resources by disturbing horizontal and vertical relationships in deposits, breaking or chipping artifacts, and contaminating data sources. As a result, the subsequent morphological and functional interpretation of the disturbed cultural assemblage may be biased. The impacts of trampling are usually most significant within one-quarter mile of stock trails, fencelines, watering areas and salt sources.

Vegetation Allocation and Grazing Systems

Under the proposed action and Alternatives 2, 3, 4 and 5, initial vegetation allocations to livestock are less than the existing situation and would result in an area-wide reduction of cultural site trampling and erosion. However, analysis of short-term impacts under the proposed action indicates that in the 21 allotments with proposed upward vegetation allocations the potential for cultural site trampling would increase.

Grazing systems with spring pasture use would result in artifact displacement, as soil would be wetter and subject to more compaction, churning and mixing. Fall use may result in reduced vegetal cover and greater susceptibility to trampling and erosion if grazed the following spring. In the long term, increased residual vegetative cover would help to control erosion at cultural sites.

Range Improvements

Range improvement project construction may serve to uncover sites not identified during the intensive cultural resource surveys which precede each ground-disturbing action (see Chapter 1). At the same time, however, construction may inadvertently disturb or totally destroy an unidentified site. Management of cultural values is a priority once cultural sites are identified. In some cases, site vandalism would result as site locations become common knowledge as a result of increasing range visitation.

Analysis indicates that some of the activities involved in implementation of the Lakeview rangeland management program have the potential to adversely impact cultural resources. For this reason, site-specific intensive field inventories would be conducted prior to ground disturbance. If cultural resources are identified, every effort would be made to design the livestock grazing and range improvement programs in order to avoid impacts to known cultural sites. This level of analysis is found in the site-specific environmental assessments completed prior to the implementation of range improvements and allotment management plans (AMPs). Where it is not prudent or feasible to avoid adverse effects, BLM will consult with the Oregon State Historic Preservation Office (SHPO) and will develop mutually acceptable mitigating measures. The Advisory Council on Historic Preservation will be notified of the agreed upon mitigating measures. If the BLM and SHPO cannot agree on mitigating measures, BLM will request the Advisory Council's comments, pursuant to 36 CFR Part 800.6. This procedure is in accordance with the programmatic Memorandum of Agreement by and between the BLM, Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers, dated January 14, 1980.

Based on existing cultural resource data, Table 3-17 identifies potential impacts to National Register sites, potential National Register sites and districts, and paleontologic sites. Tables 3-18 and 3-19 delineate potential impacts to currently identified archeologic and historic sites, respectively. Design restraints and review and protection procedures would be fully complied with to minimize adverse impacts to cultural resources. Where

Table 3-17 Potential Impacts to National Register Sites, Potential National Register Sites or Districts and Paleontologic Sites

Site	Potential Impactor 1/	Allotment/s	Impact Occurrence (by Alternative)
National Register Site			
Picture Rock Pass	Spray	400, 709	3
Oregon Central Military Road (100 yard segment)	Spray and seed; pipeline	600	3
Potential National Register Site			
Tucker Hill	Spray and seed (150 acres) adjacent	409	PA, 3, 4, 5
Connelly Caves	Spray	715	3
Fort Rock Sand Dunes	Spray and seed	904	3
Potential National Register District			
West Lake Abert	Fencing (1 mile)	400	PA, 3, 4, 5
Lost River	Burn and seed (200 acres)	890	PA, 3, 4, 5
Lucky Reservoir	Spray (200 acres)	207	3
Gerber Reservoir	Burn (200 acres)	882	PA, 3, 4, 5
	Burn and seed (400 acres)	885	3
Long Lake	Burn and seed (4,880 acres); burn (4,480 acres); Spray (300 acres); 9 waterholes; 4 reservoirs; fencing (4 miles)	216, 217, 600	PA, 3, 4, 5
	Fencing (15 miles)	216, 217, 600	5
	7 reservoirs; burn and seed (3,600 acres); burn (3,500 acres); spray (1,200 acres)	216, 217, 600	3
Twenty Mile Slough	Spray and seed (600 acres)	205	PA, 3, 4, 5
	Fencing (2 miles)	205	5
May Lake	Burn (1,080 acres); burn and seed (1,440 acres); 1 reservoir; spray and seed (1,200 acres); spray (280 acres)	212	PA, 3, 4, 5
	Fencing (3 miles)	212	5
	Burn and seed (4,200 acres); spray (3,600 acres); 4 reservoirs	212	3
Paleontologic Sites			
Fossil Lake	Fencing (3 miles)	103	PA, 3, 4, 5
Unnamed	Burn and seed (600 acres)	518	PA, 3, 4, 5
	Fencing (1 mile)	518	5
	Spray	518	3
Unnamed	Spray	600	PA, 3, 5
Unnamed	Burn and seed (300 acres)	509	PA, 3, 4, 5
Unnamed	Spray and seed; pipeline	600	3

1/ Potential impacts to the site setting integrity of cultural resources include ground disturbance, trampling, erosion and vandalism.

feasible, direct impacts to significant sites would be avoided. Often, however, the potential impacts would disturb the integrity of the site's setting. Interpretive, educational, recreational and esthetic potential of these sites would decrease.

Table 3-18 Potential Impacts to Archeologic Sites

	Number of Sites Potentially Impacted					
Site type	Proposed Action	Alt. 1 No Action	Alt. 2 Elim. Lvstk.	Alt. 3 Opt. Lvstk.	Alt. 4 Opt. Horses	Alt. 5 Opt. Other
Open	47	0	0	132	41	46
Rock Shelter	1	0	0	4	1	3
Rock Art	5	0	0	7	5	6
Burial	1	0	0	1	1	1
Total	54	0	0	144	48	56
Percentage of Total Known Sites (772)	7 %			19 %	6 %	7 %

Conclusion

Appropriate measures would be taken to identify and protect cultural sites prior to ground-disturbing activities. Should sites remain undiscovered, they would be susceptible to artifact breakage, chipping, displacement and contamination.

Analysis indicates that a number of proposed range improvements have the potential to adversely impact known cultural resources. Project redesign or the adoption of appropriate mitigating measures would serve to minimize adverse impacts to significant cultural resources. Site specific environmental assessments will apply this level of analysis to assure cultural resource protection. Final BLM compliance with 36 CFR Part 800 would occur at this time.

No direct impacts would occur to sites on or eligible for the National Register. Adverse impacts to other known sites would primarily be a result of the degradation of site setting integrity due to grazing and range improvements in proximity to the sites.

Table 3-19 Potential Impacts to Historic Sites

Site Number	Site Name	Ownership	Site Type	Quality Rating	Potential Impactor	Allotment/s	Impact Occurrence (by Alternative)
Shi-108	Reading Route	BLM; other	Emigrant trail	11/B	Reservoirs (2)	1000	PA, 3, 4, 5
					Spray (along 6 miles)	1000	3
Shi-109	Wagontire Mtn. - Abert Lake Road	BLM; other	Wagon road	7/C	Pipeline across; spray and seed (along 2.5 miles)	1001	PA, 3, 4, 5
					Spray and seed (along 5 miles)	1000	3
					Burn and seed (along 10 miles)	515	3
Shi-149	Fremont's Route	BLM; other	Scientific; military	13/B	Spray and seed (along 5 miles); Burn (along 1 mile)	205, 209, 213	PA, 3, 4, 5
					Fencing (along 2 miles);	205	5
					Fence crossing	222	5
					Burn and seed (along 3 miles)	205	3
Shi-193	Oregon Central Military Road	BLM	Wagon road	17/A	2 pipelines across; adjacent spray and seed (640 acres)	600	PA, 3, 5
					Burn and seed adjacent	600	3
					2 fence crossings	600	5
					Spray (along 2 miles); spray and seed (along 3 miles)	600	3
Shi-237	Oregon Central Military Road	BLM; other	Wagon road	17/A	3 miles fence along	519	PA, 3, 5
					Burn and seed (along 1 mile)	519	3
Shi-239	Fremont's Route	BLM; other	Scientific; military	13/B	Burn and seed (along 1.5 miles); fencing; pipeline	515, 516, 517	PA, 3, 4, 5
					Spray and seed (along 8 miles)	515, 516	3
Shi-241	Coyote Hills Mining District	BLM	Mining	11/B	Reservoirs (2); spring; fencing (1 mile); spray and seed (800 acres)	517	PA, 3, 4, 5
					Fencing (7 miles)	517	5
Shi-245	Sid Luce Ditch area	other	Agriculture; residence	---	Adjacent burn and seed	518	PA, 3, 4, 5
					Fencing	518	5
Shi-247	---	BLM; other	Wagon road	12/B	Burn and seed (along 5 miles); Spray and seed (1.5 miles); fencing (along 4 miles); waterhole and pipeline	511, 512, 517, 523	PA, 3, 4, 5
					Burn (along 8 miles)	511	3
					Burn and seed (along 3 miles)	512	3
					Spray and seed (along 4 miles)	517	3
Shi-283	Fremont's Route	BLM; other	Scientific; military	14/B	Spray and seed (along 1 mile)	404, 409	PA, 3, 4, 5
Shi-032	Prineville - Silverlake	BLM; other	Wagon road	17/A	Pipeline (3 miles)	908	PA, 3, 4, 5
					Spray and seed (along 2 miles)	908	3
---	Road to Elgi	BLM; other	Wagon road	---	Fencing across (2 locations)	1000	PA, 3, 4, 5
---	Dry Valley	BLM; other	Wagon road	---	Fencing across (2 locations); pipeline (1 mile)	1000	PA, 3, 4, 5
---	Road to Sheep Camp	BLM; other	Wagon road	---	Burn (1,800 acres); fencing	510	PA, 3, 4, 5
---	Surprise Valley to Harney	BLM; other	Wagon road	---	Spray and seed (1,200 acres)	523	PA, 3, 4, 5
---	Sheldon Range Vicinity	BLM; other	Wagon road	---	Burn and seed (400 acres)	600	PA, 3, 4, 5
Shi-031	Yreka Trail	BLM; other	Trail	17/A	Fencing (5 miles); waterhole	102, 103	PA, 3, 4, 5
					Spray (along 10 miles)	103	3
Shi-030	Jacksonville-Boise City	BLM; other	Wagon road	13/B	2 fence crossings	103	PA, 3, 4, 5
					Spray (along 12 miles)	103	3
Shi-152	Line Cabins	BLM; other	Cabins	13/8	Spray	207	3
Shi-195	Spalding Ranch	other	Settlement	---	Burn	600	3

IMPACTS ON VISUAL RESOURCES

Vegetation Allocation and Grazing Systems

Under the proposed action and Alternatives 1, 3, 4 and 5, no significant impacts to visual resources would result due to vegetation allocation. The elimination of grazing (Alternative 2) would improve visual resources primarily due to increased plant diversity and reestablished vegetation in trampled areas.

Grazing systems (especially rest rotation and deferred rotation) create contrast between grazed and rested pastures. Under the proposed action and Alternatives 3, 4 and 5, this contrast would be significant in some localized areas. Under Alternative 1, visual contrast would not increase over that under the existing situation. Contrasts due to grazing systems would not occur under Alternative 2. Under the proposed action and Alternatives 3, 4 and 5, VRM Class I objectives may not be met in the Lost Forest area of Allotment 103 as a result of a proposed rest rotation grazing system there. In areas managed under VRM Class II and III objectives, impacts of grazing systems would be minimal as the implementation of VRM program procedures and constraints would allow for compatibility with the class objectives. In the long term, as forage abundance and quality improve, contrasts between pastures would not be as significant.

Range Improvements

Each type of range improvement was examined to determine the degree of contrast it would create to the typical landscape of the Lakeview EIS area (BLM Manual 8431). No impacts would occur in VRM Class IV areas. Table 3-20 identifies the range improvements under the proposed action and alternatives which have the potential to exceed the maximum visual impact consistent with foreground-middleground zones of VRM Class II and III lands. Impacts would be minimal in background or seldom seen zones (greater than 5 miles from the viewer). Alternatives 1 and 2 would create no impacts as a result of range improvements. Additional range improvements occurring under Alternative 3 would increase those impacts identified as a result of the proposed action. Under this alternative, additional impacts would be significant in some areas of Allotments 103, 206, 208, 400, 519, 520 and 709 where extensive vegetation manipulation would take place in VRM Class I or II areas. Under Alternative 4, fewer range improvements (see Table 1-3) in Allotments 103, 400 and 600 would slightly reduce those impacts associated with the proposed action.

Under Alternative 5, an additional 7 miles of fencing in Allotments 201 and 208 would exceed the maximum visual impact consistent with the foreground-middleground of that VRM Class II area. Under the proposed action and Alternatives 3, 4 and 5, decreased vegetative cover in localized livestock concentration areas around all new water developments would also create significant visual contrast.

Table 3-20 Potential Impacts to Visual Resources

VRM Class	Area of Potential Impact (sensitivity area)	Visual Sensitivity Level	Impactor 2/	Allotment/s	Impact Occurrence (by Alternative)
I	Lost Forest	High	Spray (3,600 acres)	103	3
II	Fremont Highway 31 near Lower Chewaucan Marsh	Medium	Burn and seed (150 acres); fencing (3 miles); waterhole	400	PA, 3, 4, 5
	Fremont Highway 31, vicinity of Silver Lake	Medium	Burn and seed (840 acres); fencing (10 miles)	400, 709, 710	PA, 3, 4, 5
			Burn (600 acres)	705, 901	3
			Spray (5,400 acres)	400, 709	3
			Burn and seed (300 acres)	713	3
			Spray and Seed (300 acres)	710	3
			chain and seed (640 acres)	709	3
	Gerber Reservoir	Medium, High	Burn (1,900 acres); fencing (1 mile); reservoir	882, 883, 885	
			Burn and seed (640 acres)	885	3
	West of Monument Flat, vicinity of Fish and Drakes Creeks, Highway 140, Road to Plush	High	Burn and seed (1,090 acres); spray and seed (320 acres); fencing (11 miles); spring development; waterhole; 2 reservoirs	206, 500, 501, 519, 520	PA, 3, 4, 5
			Burn and seed (18,000 acres)	206, 519, 520	3
			Spray and seed (4,800 acres)	520	3
			Spray (1,850 acres)	206, 208	3
			Fencing (7 miles)	201, 208	5
			1 reservoir	208	3
III	Highway 70 and Poe Valley Road	High	Burn and seed (120 acres); chain and seed (100 acres)	829, 838	PA, 3, 4, 5
	Malin-Bonanza Road	High	Burn and seed (30 acres); juniper control (75 acres)	801	PA, 3, 4, 5
	East Langell Road	High	Burn (80 acres)	883	PA, 3, 4, 5
	Willow Valley Road	High	Burn and Seed (450 acres); 3 waterholes	890	PA, 3, 4, 5
	Highway 31	Medium	Fence (12 miles)	400	PA, 3, 4, 5
			Spray (6,000 acres)	400	3
	Fossil Lake	Medium	Fence (4 miles)	103	PA, 3, 4, 5
	Doughtery Rim Road	Low	Spray (300 acres); burn and seed (300 acres)	600	PA, 3, 4, 5
	Twenty Mile Creek	Low	Reservoir	211	
	Highway 140	Medium	Burn (940 acres); spray and seed (1,000 acres)	205, 210, 211, 213, 215	
			Burn (6,500 acres)	205, 215, 217, 222	3
			Spray (3,600 acres)	210, 215	3
			3 reservoirs	217, 222, 600	3
			Burn and seed (4,000 acres)	600	3
			Spray and seed (800 acres)	211, 218	3
	Adel to Plush Road	Low	Spray and seed (200 acres); burn and seed (640 acres)	204, 222	PA, 3, 4, 5
	Highway 140 to Plush Road	Medium	Burn and seed (400 acres)	502, 503	PA, 3, 4, 5
			Burn (640 acres); spray (640 acres)	503	3
	Hogback Road	Low	Spray and seed (1,800 acres)	523	PA, 3, 4, 5
	Bonanza Highway near Dairy	Medium	Burn (800 acres)	807	3
	Warner Valley	Medium	8 reservoirs	523	3
			Fencing (12 miles)	523	5

1/ Impacts would be most significant in areas of medium or high visual sensitivity, as based on an evaluation of user volume, user concern, zone of influence and special interest group concern.
2/ All impactors listed would occur in the foreground-middleground visual distance zone (within 5 miles of the sensitivity area identified).

Conclusion

Certain portions of the Lakeview EIS area may experience degradation of visual quality. Design features, as well as VRM program procedures and constraints, would minimize landform and vegetative contrast changes.

Visual contrasts due to vegetation manipulation would be temporary until vegetation is reestablished. In the long term, visual quality would improve as range condition improves. Potential impactors identified in Table 3-20 would be most significant in VRM Class I, II and III foreground-middleground areas with high or medium visual sensitivity.

IMPACTS TO AREAS OF CRITICAL ENVIRONMENTAL CONCERN

No impacts would occur to the two areas proposed for ACEC designation under the proposed action and Alternatives 1, 2, 4 and 5. Under Alternative 3, the Lost Forest would be adversely impacted as about 2,400 acres of the area would be sprayed for sagebrush control (Allotment 103). The change in species composition would impact the natural values of this Research Natural Area.

IMPACTS TO SPECIAL AREAS

Impacts to the Lost Forest Research Natural Area are discussed in the preceding section dealing with Impacts to Areas of Critical Environmental Concern.

Warner Valley would be adversely impacted under the proposed action and Alternatives 4 and 5. Numerous range improvements are proposed within Allotments 511, 512 and 523 of the Warner Valley potential National Natural Landmark identified by the Heritage Conservation and Recreation Service (HCRS). Proposed improvements include 9.5 miles of fence (Allotments 511, 512, 523), three waterholes (512), 1,280 acres of burning and seeding (512) and 2,800 acres of spraying and seeding (523). Weide (1973) stated that North Warner Valley's relatively undisturbed nature makes it ideal for studying geomorphic processes and historic and prehistoric water features. Proposed improvements would have slight adverse impacts on this relatively undisturbed condition. However, it is not expected that the proposed improvement projects would adversely impact the waterfowl habitat and geologic features which make the area significant.

Under Alternative 3, an additional 1,800 acres of burning followed by seeding (Allotment 512), 1.5 miles of pipeline (512), two wells (512) and eight reservoirs (523) would create additional adverse impacts in Warner Valley.

No impacts to special areas would occur under Alternatives 1 and 2.

IMPACTS ON ENERGY USE

Table 3-21 indicates the energy investment in British Thermal Units (Btu's) required for range improvement project construction and annual maintenance

for the proposed action and alternatives. Alternative 1 would only require energy consumption to maintain existing range improvements. Alternative 2 would not consume any energy. It is assumed that all energy consumed would be in the form of fossil fuels or derivatives.

Under the proposed action, the annual average energy investment of 113 billion Btu's for new project construction during the implementation period is about .02 percent of the projected 1980 Oregon total of 581 trillion Btu's (Oregon Department of Energy 1980).

Table 3-21 Estimated Energy Consumption for New Range Improvement Project Construction and Maintenance

	Energy Consumption (1,000,000 Btu's) For Construction	Energy Consumption (1,000,000 Btu's) For Annual Maintenance of New Projects
Proposed Action	1,130,300	10,900
Alternative 1 (No Action)	0	0
Alternative 2 (Elim. Lvstk.)	0	0
Alternative 3 (Opt. Lvstk.)	3,847,500	48,100
Alternative 4 (Opt. Horses)	881,200	8,000
Alternative 5 (Opt. Other)	1,341,800	11,100

IMPACTS ON SOCIOECONOMIC CONDITIONS

Introduction

The economic impacts of the proposed action and alternatives are expressed in terms of the effects on: annual forage needs of users (operators); ranch sale and collateral values; ranch income and operations; and local income and employment from grazing, construction of range improvements, hunting and fishing and other recreational activity. Social impacts not primarily economic in nature are discussed as appropriate.

Effect on Users' Forage Needs

The effects of the proposed action and alternatives on the forage needs of individual operators were calculated on the assumption that future livestock forage allocations would be assigned to users in each allotment in direct proportion to their 1979 active preference in that allotment. Permitted or leased use in 1979 was subtracted from future allocations determined in this

way and the result (representing the change in AUMs for that operator) was converted to a proportion of the operator's annual forage needs (by dividing by 12 times the herd size). Since these effects are measured as changes from 1979 permitted/leased use as a base, they do not correspond with changes measured from 1979 active preference.

Table 3-22 and 3-23 show how individual operators would be affected in terms of their annual forage requirements by the alternative actions at initial implementation (Table 3-22) and in the long term (Table 3-23). These tables show the number of operators in each herd size class classified by whether they would have a loss, no change or a gain in public forage (forage from BLM-administered lands). Those losing forage are classified by the size of their loss in terms of their annual forage requirements.

Also shown in these tables is the average change in forage as a percent of annual requirements. This figure equals the total change in public forage expressed as a percentage of the annual forage needs of all operators' herds combined.

The seasonal distribution of public forage use is expected to correspond with that shown in Table 2-20 except for Alternative 2 (Eliminate Livestock Grazing).

Under the proposed action, one operator (with less than 100 animals) would lose public forage amounting to more than 20 percent of annual forage needs. This loss would exceed 20 percent of annual needs both initially and in the long term. No other operator would lose more than 10 percent of annual needs. At initial implementation, public forage would be increased by an average of 0.5 percent of operator annual needs, and in the long term, it would be increased by 6.9 percent of present needs.

The effects of other alternatives with the exception of Alternatives 1 and 2 may be seen in the tables. Alternative 1 would continue existing public forage use. The effect of Alternative 2 may be determined from Table 2-19 which shows operator dependence on the public forage which would be withdrawn by the implementation of this alternative.

Effect on Ranch Collateral and Sale Values

As noted in Chapter 2, BLM does not recognize grazing permits and leases as vested property rights; however, de facto effects on private asset valuation may occur. The effect on ranch values as collateral for loans or in the sale of the enterprise has been calculated by valuing public forage use at $45 per AUM. Tables 3-24 and 3-25 (Alternative 2) show the number of operators experiencing a loss in ranch value by size of loss.

A temporary reduction in value at initial implementation might not be consequential unless a loan were sought or the property sold during the period of reduction.

Table 3-22 Number of Operators Affected by Change in Public Forage - Initial Implementation 1/
(Change in public forage expressed as percent of annual forage requirements.)

Change in forage as percent of annual requirements	Lake and Harney Counties				Klamath County				EIS Area			
	P. A.	Alt.3	Alt.4	Alt.5	P. A.	Alt.3	Alt.4	Alt.5	P. A.	Alt.3	Alt.4	Alt.5
HERD SIZE - UNDER 100 ANIMAL UNITS												
Loss over 20.0 %	1	1	1	1	-	-	-	-	1	1	1	1
-15.0 to -19.9 %	-	-	-	-	-	-	-	-	-	-	-	-
-10.0 to -14.9 %	-	-	-	-	-	-	-	1	-	-	-	1
- 5.0 to - 9.9 %	-	-	-	2	-	-	-	3	-	-	-	5
- 0.1 to - 4.9 %	2	2	3	2	2	2	2	6	4	4	5	8
No change	4	4	3	2	23	23	22	14	27	26	25	16
Gain	6	6	6	6	2	3	3	3	8	9	9	9
Average change	+10.2	+10.5	+ 9.8	+ 7.5	+ 1.3	+ 2.9	+ 2.8	- 0.1	+ 5.0	+ 6.0	+ 5.7	+ 3.1
HERD SIZE - 100 to 399 ANIMAL UNITS												
Loss over 20.0 %	-	-	-	-	-	-	-	-	-	-	-	-
-15.0 to -19.9 %	-	-	1	1	-	-	-	-	-	-	-	-
-10.0 to -14.9 %	-	-	-	-	-	-	-	-	-	-	1	1
- 5.0 to - 9.9 %	1	1	1	2	-	-	-	3	1	1	1	5
- 0.1 to - 4.9 %	2	2	1	4	1	1	1	8	3	3	2	12
No change	8	8	8	5	25	25	25	15	33	33	33	20
Gain	8	8	8	7	5	5	5	5	13	13	13	12
Average change	+ 4.9	+ 4.9	+ 3.9	+ 2.5	+ 1.7	+ 1.7	+ 1.7	+ 0.3	+ 2.9	+ 3.0	+ 2.6	+ 1.2
HERD SIZE - 400 to 999 ANIMAL UNITS												
Loss over 20.0 %	-	-	-	-	-	-	-	-	-	-	-	-
-15.0 to -19.9 %	-	-	-	1	-	-	-	-	-	-	-	1
-10.0 to -14.9 %	-	-	-	1	-	-	-	-	-	-	-	1
- 5.0 to - 9.9 %	1	1	2	5	-	-	-	1	1	1	2	6
- 0.1 to - 4.9 %	11	11	10	9	1	1	1	4	12	12	11	13
No change	2	3	3	1	8	8	8	4	10	11	11	5
Gain	10	9	9	7	1	1	1	1	11	10	10	8
Average change	+ 0.2	+ 0.3	- 0.5	- 2.8	+ 0.2	+ 0.2	+ 0.2	- 1.0	+ 0.2	+ 0.3	- 0.3	- 2.3
HERD SIZE - 1,000 OR MORE ANIMAL UNITS												
Loss over 20.0 %	-	-	1	-	-	-	-	-	-	-	1	-
-15.0 to -19.9 %	-	-	-	-	-	-	-	-	-	-	-	-
-10.0 to -14.9 %	-	-	-	-	-	-	-	-	-	-	-	-
- 5.0 to - 9.9 %	-	-	-	3	-	-	-	-	-	-	-	3
- 0.1 to - 4.9 %	8	8	9	12	-	-	-	1	8	8	9	13
No change	3	3	3	2	-	-	-	-	3	3	3	2
Gain	9	9	7	3	1	1	1	-	10	10	8	3
Average change	- 0.0	+ 0.2	- 4.4	- 2.1	+ 0.5	+ 1.3	+ 1.3	- 0.8	- 0.0	+ 0.2	- 4.3	- 2.1
ALL OPERATORS												
Loss over 20.0 %	1	1	2	1	-	-	-	-	1	1	2	1
-15.0 to -19.9 %	-	-	1	2	-	-	-	-	-	-	1	2
-10.0 to -14.9 %	-	-	-	1	-	-	-	1	-	-	-	2
- 5.0 to - 9.9 %	2	2	3	12	-	-	-	7	2	2	3	19
- 0.1 to - 4.9 %	23	23	23	27	4	4	4	19	27	27	27	46
No change	17	18	17	10	56	55	55	33	73	73	72	43
Gain	33	32	30	23	9	10	10	9	42	42	40	32
Average change	+ 0.4	+ 0.6	- 0.3	- 1.9	+ 0.9	+ 1.1	+ 1.1	- 0.3	+ 0.5	+ 0.7	- 2.3	- 1.6

1/ Alternatives 1 and 2 have been omitted from the table. It is assumed that no changes would occur under Alternative 1. Table 2-19 shows the public forage use which would be lost under Alternative 2.

Table 3-23 Number of Operators Affected by Change in Public Forage - Long-Term Allocation 1/
(Change in public forage expressed as percent of annual forage requirements.)

Change in forage as percent of annual requirements	Lake and Harney Counties				Klamath County				EIS Area			
	P. A.	Alt.3	Alt.4	Alt.5	P. A.	Alt.3	Alt.4	Alt.5	P. A.	Alt.3	Alt.4	Alt.5
HERD SIZE - UNDER 100 ANIMAL UNITS												
Loss over 20.0 %	1	-	1	1	-	-	-	-	1	-	1	1
-15.0 to -19.9 %	-	-	-	-	-	-	-	-	-	-	-	-
-10.0 to -14.9 %	-	-	-	-	-	-	-	-	-	-	-	-
- 5.0 to - 9.9 %	-	-	-	1	-	-	-	2	-	-	-	3
- 0.1 to - 4.9 %	1	1	1	2	-	-	-	8	1	1	1	10
No change	3	2	3	2	14	14	14	9	17	16	17	11
Gain	8	10	8	7	13	13	13	8	21	23	21	15
Average change	+12.4	+28.5	+12.6	+ 9.8	+ 4.0	+ 5.3	+ 4.0	+ 1.1	+ 7.5	+15.0	+ 7.6	+ 4.7
HERD SIZE - 100 to 399 ANIMAL UNITS												
Loss over 20.0 %	-	-	-	-	-	-	-	-	-	-	-	-
-15.0 to -19.9 %	-	-	-	-	-	-	-	-	-	-	-	-
-10.0 to -14.9 %	-	-	1	1	-	-	-	-	-	-	1	1
- 5.0 to - 9.9 %	-	-	-	-	-	-	-	1	-	-	-	1
- 0.1 to - 4.9 %	1	1	1	4	2	1	2	7	3	2	3	11
No Change	6	4	6	5	11	11	12	12	17	15	18	17
Gain	12	14	11	9	18	19	17	11	30	33	28	20
Average change	+ 7.2	+20.6	+ 5.8	+ 4.7	+ 2.4	+ 3.4	+ 2.5	+ 1.2	+ 4.3	+10.2	+ 3.8	+ 2.6
HERD SIZE - 400 to 999 ANIMAL UNITS												
Loss over 20.0 %	-	-	-	-	-	-	-	-	-	-	-	-
-15.0 to -19.9 %	-	-	-	-	-	-	-	-	-	-	-	-
-10.0 to -14.9 %	-	-	-	-	-	-	-	-	-	-	-	-
- 5.0 to - 9.9 %	-	-	-	1	-	-	-	-	-	-	-	1
- 0.1 to - 4.9 %	1	1	5	10	-	-	-	5	1	1	5	15
No change	-	-	-	-	8	7	8	4	8	7	8	4
Gain	23	23	19	13	2	3	2	1	25	26	21	14
Average change	+ 7.1	+16.8	+ 5.7	+ 3.3	+ 0.8	+ 1.5	+ 0.8	- 0.4	+ 5.2	+12.3	+ 4.2	+ 2.2
HERD SIZE - 1,000 OR MORE ANIMAL UNITS												
Loss over 20.0 %	-	-	-	-	-	-	-	-	-	-	-	-
-15.0 to -19.9 %	-	-	1	-	-	-	-	-	-	-	1	-
-10.0 to -14.9 %	-	-	-	-	-	-	-	-	-	-	-	-
- 5.0 to - 9.9 %	-	-	-	-	-	-	-	-	-	-	-	-
- 0.1 to - 4.9 %	-	-	3	5	-	-	-	1	-	-	3	6
No change	1	1	1	2	-	-	-	-	1	1	1	2
Gain	19	19	15	13	1	1	1	-	20	20	16	13
Average Change	+ 8.2	+24.6	+ 1.6	+ 6.2	+ 2.0	+ 2.1	+ 2.0	- 0.1	+ 8.1	+24.1	+ 1.6	+ 6.1
ALL OPERATORS												
Loss over 20.0 %	1	-	1	1	-	-	-	-	1	-	1	1
-15.0 to -19.9 %	-	-	1	-	-	-	-	-	-	-	1	-
-10.0 to -14.9 %	-	-	1	1	-	-	-	-	-	-	1	1
- 5.0 to - 9.9 %	-	-	-	2	-	-	-	3	-	-	-	5
- 0.1 to - 4.9 %	3	3	10	21	3	1	2	21	5	4	12	42
No change	10	7	10	9	33	32	34	25	43	3	44	34
Gain	62	66	53	42	34	36	33	20	96	102	86	62
Average change	+ 8.0	+22.9	+ 2.8	+ 5.6	+ 1.9	+ 2.7	+ 1.9	+ 0.4	+ 6.9	+19.5	+ 2.6	+ 4.7

1/ Alternatives 1 and 2 have been omitted from the table. It is assumed that no changes would occur under Alternative 1. Table 2-19 shows the public forage use which would be lost under Alternative 2.

Table 3-24 Number of Operators with Loss in Ranch Value 1/
(Losses calculated on assumed value of $45 per AUM active preference)

Loss in Ranch Value	Proposed Action		#3 Opt. Livestock		#4 Opt. Horses		#5 Opt. Other	
	Initial	Long Term	Initial	Long Term	Initial	Long Term	Initial	Long Term
HERD SIZE - UNDER 100 ANIMAL UNITS								
Lake and Harney Counties:								
Under $100	1	1	-	-	1	1	-	1
$100 - 999	3	1	2	-	1	2	4	4
$1,000 - 4,999	-	-	-	-	2	-	3	2
$5,000 - 9,999	-	-	-	-	-	-	1	1
Total	3	2	2	0	4	3	8	8
Klamath County:								
Under $100	2	-	2	-	2	-	2	-
$100 - 999	-	-	-	-	-	-	6	8
$1,000 - 4,999	-	-	-	-	-	-	3	4
$5,000 - 9,999	-	-	-	-	-	-	1	-
Total	2	0	2	0	2	0	12	12
HERD SIZE - 100-399 ANIMAL UNITS								
Lake and Harney Counties:								
Under $100	1	1	-	-	-	1	1	1
$100 - 999	1	1	1	1	1	1	3	2
$1,000 - 4,999	-	-	-	-	-	-	2	3
$5,000 - 9,999	-	-	-	-	-	-	4	1
$10,000 - 19,999	-	-	-	-	-	1	1	1
$20,000 - 29,000	-	-	-	-	1	-	-	-
Total	2	2	1	1	2	3	11	8
Klamath County:								
Under $100	-	-	1	-	1	-	2	-
$100 - 999	-	-	-	-	-	-	3	4
$1,000 - 4,999	-	-	-	-	-	1	4	4
$5,000 - 9,999	-	-	-	-	-	-	2	1
$10,000 - 19,999	-	-	-	-	-	-	2	-
Total	0	0	1	0	1	1	13	9
HERD SIZE - 400-999 ANIMAL UNITS								
Lake and Harney Counties:								
Under $100	-	-	-	-	-	-	-	-
$100 - 999	-	-	1	-	-	-	1	-
$1,000 - 4,999	5	-	5	-	2	4	2	5
$5,000 - 9,999	5	-	5	-	6	3	2	3
$10,000 - 19,999	2	-	1	-	3	1	7	2
$20,000 - 29,999	-	-	-	-	1	-	3	-
$30,000 - 39,999	-	-	-	-	-	-	1	1
$40,000 - 49,999	-	-	-	-	-	-	-	-
$50,000 - 59,999	-	-	-	-	-	-	1	-
Total	12	-	12	0	12	8	17	11
Klamath County:								
Under $100	-	-	-	-	-	-	-	-
$100 - 999	-	-	-	-	-	-	3	3
$1,000 - 4,999	1	-	2	-	2	-	1	2
$5,000 - 9,999	-	-	-	-	-	-	1	1
$10,000 - 19,999	-	-	-	-	-	-	-	-
$20,000 - 29,999	-	-	-	-	-	-	1	-
Total	1	0	2	0	2	0	6	6
HERD SIZE - OVER 1,000 ANIMAL UNITS								
Lake and Harney Counties:								
Under $100	-	-	-	-	-	-	-	-
$100 - 999	1	-	1	-	1	-	-	1
$1,000 - 4,999	-	2	-	-	-	-	1	-
$5,000 - 9,999	2	1	1	-	1	2	5	1
$10,000 - 19,999	2	-	3	-	2	1	1	2
$20,000 - 29,999	1	-	2	-	2	-	2	2
$30,000 - 39,999	-	-	1	-	-	1	3	1
$40,000 - 49,999	1	-	-	-	-	1	-	-
$50,000 - 99,999	1	-	-	-	2	-	2	-
$100,000 - 199,999	1	-	1	-	-	-	2	-
$200,000 - 299,999	-	-	-	-	-	-	1	-
$300,000 - 399,999	-	-	-	-	1	-	-	-
$400,000 - 499,999	-	-	-	-	-	-	-	-
$500,000 - 999,999	-	-	-	-	-	1	-	-
$1.0 - 1.1 million	-	-	-	-	1	-	-	-
Total	9	3	9	0	10	6	17	7
Klamath County:								
Under $100	-	-	-	-	-	-	-	-
$100 - 999	-	-	-	-	-	-	-	-
$1,000 - 4,999	-	-	-	-	-	-	-	1
$5,000 - 9,999	-	-	-	-	-	-	1	-
Total	0	0	0	0	0	0	1	1

1/ Changes in active preference rather than permitted use are used for the calculation of changes in ranch values. Losses under Alternative 2 - Eliminate Livestock are tabulated in Table 3-25.

Table 3-25 Number of Operators with Loss in Ranch Value under Alternative 2 - Eliminate Livestock 1/
(Losses calculated on assumed value of $45 per AUM active preference)

Implied loss in Ranch Value	Under 100 Animals	100-399 Animals	400-999 Animals	1,000 or more Animals	Total
		LAKE AND HARNEY COUNTIES			
Under $100	-	-	-	-	-
$100 - 999	1	6	-	-	7
$1,000 - 4,999	7	2	-	1	10
$5,000 - 9,999	1	2	2	-	5
$10,000 - 19,999	3	2	2	1	8
$20,000 - 29,999	-	2	2	3	7
$30,000 - 39,999	-	1	3	1	5
$40,000 - 49,999	1	2	4	-	7
$50,000 - 99,999	-	2	10	1	13
$100,000 - 199,999	-	-	1	6	7
$200,000 - 299,999	-	-	-	4	4
$300,000 - 399,999	-	-	-	1	1
$400,000 - 499,999	-	-	-	-	-
$500,000 - 999,999	-	-	-	-	-
$1.0 - 1.5 Million	-	-	-	2	2
Total	13	19	24	20	76
		KLAMATH COUNTY			
Under $100	-	-	-	-	-
$100 - 999	6	3	1	-	10
$1,000 - 4,999	16	12	6	-	34
$5,000 - 9,999	5	6	1	-	12
$10,000 - 19,999	-	9	1	-	10
$20,000 - 29,999	-	-	-	-	-
$30,000 - 39,999	-	-	-	-	-
$40,000 - 49,999	-	1	-	-	1
$50,000 - 99,999	-	-	-	1	1
$100,000 - 199,999	-	-	1	-	1
Total	27	31	10	1	69

1/ Changes in active preference rather than permitted use are used for the calculation of changes in ranch values.

An operator experiencing a substantial reduction in the value of property used as collateral might be forced to sell out. The social impact for the operator and family would probably be more severe than that associated with the loss of another kind of business because of the close connection of the ranching occupation and lifestyle. The intense involvement of the ranch family in the business means a substantial social adjustment in changing livelihoods. A second factor increasing the difficulty of change is the relative isolation from other occupations and lifestyles.

The effect on ranch values in total for the proposed action and each alternative is as follows:

Action	Initial Implementation	Long Term
Proposed Action	$- 334,000	$+2,595,000
Alternative 1	No change	No change
Alternative 2	-7,495,000	-7,495,000
Alternative 3	- 236,000	+8,279,000
Alternative 4	-1,608,000	+ 636,000
Alternative 5	-1,291,000	+1,581,000

Effect on Average Operating Income

To determine the effect of changes in the availability of public forage on ranch operations, representative budgets for four herd size classes were developed from information obtained from a survey of operators. The effects of average changes in public forage were analyzed by the Economics and Statistics Service of the Department of Agriculture (Gee 1981) by means of linear program models which determined the optimum business adjustment. The budgets and results of the analysis are presented in Appendix O.

The changes in the average operator's return above cash costs are shown in Table 3-26. Alternative 1 has been omitted from the table since no change would occur.

Effect of Changes in Public Forage Use on Income and Employment

The effect of the various potential management actions on sales of the livestock industry and on the personal income of ranchers and the rest of the community is shown in Table 3-27.

Table 3-26 Effect on Average Return Above Cash Costs
(Average return per ranch, 1977-78 average prices)

Herd Size	1979 Permitted Use Base	Proposed Action Initial	Proposed Action Long Term	Alt. 2 Elim. Lvstk.	Alt. 3 Opt. Lvstk Initial	Alt. 3 Opt. Lvstk Long Term	Alt. 4 Opt. Horses Initial	Alt. 4 Opt. Horses Long Term	Alt. 5 Opt. Other Initial	Alt. 5 Opt. Other Long Term
LAKE AND HARNEY COUNTIES										
Under 100	$ 10,228	$1,320	$ 1,378	$- 1,616	$1,320	$ 3,405	$ 1,083	$1,378	$ 834	$ 1,083
100-399	26,234	1,569	2,334	- 3,146	1,569	6,359	1,255	1,862	787	1,529
400-999	86,287	195	6,302	-13,853	273	14,849	-422	5,006	-2,588	2,912
1,000 or more	354,540	-205	34,398	-63,299	907	103,339	-18,626	6,810	-8,836	26,025
All Operators	128,857	626	11,861	-22,095	943	34,056	-4,536	4,074	-2,803	8,336
KLAMATH COUNTY										
Under 100	$ 6,834	$ 108	$ 298	$ -796	$ 234	$ 419	$ 108	$ 298	$ -4	$ 81
100-399	24,469	508	739	-1,485	522	966	508	739	86	355
400-999	87,606	157	746	-4,402	154	1,389	157	746	-884	-344
1,000 or more	168,275	1,042	4,023	-12,501	2,613	4,133	1,042	4,023	-1,598	-191
All Operators	28,803	308	615	-1,798	386	859	308	615	-114	739

Table 3-27 Effect of Changes in Public Forage on Livestock Sales and Personal Income (Thousands of 1978 dollars)

Alternative Action and Area Affected [1]	Livestock Sales [3]		Personal Income [4]			
			Livestock Industry		Other Local Industries	
	Initial	Long Term	Initial	Long Term	Initial	Long Term
Proposed Action:						
Lake County [2]	71.6	1480.9	19.3	400.2	7.4	152.3
Klamath County	41.1	80.9	6.6	13.0	7.8	15.3
EIS Area	112.7	1561.8	25.9	413.2	15.2	167.6
Alternative 2:						
Lake County [2]	-3183.6	3183.6	-860.3	-860.3	-322.5	-322.5
Klamath County	-34.8	-34.8	-5.6	-5.6	-6.6	-6.6
EIS Area	-3218.4	3218.4	-865.9	-865.9	-329.1	-329.1
Alternative 3:						
Lake County [2]	111.8	4225.9	30.2	1142.0	11.5	434.7
Klamath County	49.3	115.6	7.9	18.6	9.3	21.8
EIs Area	161.1	4341.5	38.1	1160.6	20.8	456.5
Alternative 4:						
Lake County [2]	-584.3	491.5	-157.9	132.8	-60.1	50.6
Klamath County	49.3	82.0	7.9	13.2	9.3	15.5
EIS Area	-535.0	573.5	-150.0	146.0	-50.8	66.1
Alternative 5:						
Lake County [2]	-352.6	1047.0	-95.3	282.9	-36.3	107.7
Klamath County	-14.7	18.7	-2.4	3.0	-2.8	3.5
EIS Area	-367.3	1065.7	-97.7	285.9	-39.1	104.2

1/ Alternative 1 is omitted because it represents no change from the existing situation discussed in Chapter 2.
2/ Includes grazing use in Harney County.
3/ Derived from linear program analysis. See Appendix O.
4/ Calculated as amount of income generated in local private industry per dollar of livestock sales, from interindustry models for Lake and Klamath Counties (Appendix N).

Changes in local employment resulting from changes in public forage use would be as follows:

	Number of Workers
Proposed Action:	
Initial Implementation	+ 6
Long Term	+ 95
Alternative 2 - Eliminate Livestock	
Initial Implementation	-199
Long Term	-199
Alternative 3 - Optimize Livestock	
Initial Implementation	+ 9
Long Term	+267
Alternative 4 - Optimize Horses	
Initial Implementation	- 34
Long Term	+ 34
Alternative 5 - Optimize Wildlife	
Initial Implementation	- 22
Long Term	+ 66

Other Effects

Table 3-28 shows the impacts of construction activity resulting from the alternative actions. These impacts would occur over a several year period assumed to be 10 years.

The impacts of changes in recreational activity are shown in Table 3-29. These impacts are calculated as the difference between the amount of income expected in 1990 under each alternative and the amount which would have occurred in the absence of any change in BLM management. Changes in employment related to these income changes are considered minor.

Table 3-28 Impact of Construction on Personal Income and Employment
(Thousands of 1978 dollars)

Alternative Action 1/	Construction Value 2/	Personal Income 3/	Employment 3/ (work-years)
Proposed Action	$10,099	$11,049	677
Alt. 3-Optimize Livestock	31,866	34,864	2,136
Alt. 4-Optimize Horses	8,115	8,879	544
Alt. 5-Optimize Other	11,467	12,545	768

1/ Alternatives 1 and 2 would not involve construction activity.
2/ Total estimated cost of all range improvements for each alternative.
3/ Estimated from inter-industry models (Appendix N). Represents total amount generated over the whole construction period assumed to be 10 years long.

Table 3-29 Impacts of Changes in Recreational Activity on Personal Income
(1990 conditions, thousands of 1978 dollars)

Alternative Action	Hunting	Fishing	Other Recreation	Total
Proposed Action	$+ 6.0	$+18.7	$-17.6	$+ 7.1
Alternative 1 - No Action	--	--	--	--
Alternative 2 - Eliminate Livestock	+ 6.0	+24.4	+17.7	+48.1
Alternative 3 - Optimize Livestock	-13.8	0.0	-53.1	-67.0
Alternative 4 - Optimize Horses	3.0	+18.7	-17.6	+ 4.1
Alternative 5 - Optimize Other	8.4	+21.6	-17.6	+12.4

Summary

One operator would experience forage losses of more than 10 percent of forage requirements under the proposed action, and a maximum of five operators would lose more than 10 percent of their requirements under any alternative except Alternative 2.

In the long term, increases in public forage use would be achieved under the proposed action and all alternatives except Alternatives 1 and 2.

Changes in local personal income and employment attributable to the proposed action and alternatives are shown in Tables 3-30 and 3-31.

Table 3-30 Summary of Changes in Annual Local Personal Income
(Thousands of 1978 dollars)

Alternative Action 1/	Grazing	Recreation	Construction 2/	Total
Proposed Action:				
Initial Implementation	+ 41	--	+1,105	+1,146
Long Term	+ 581	+ 7.1	--	+ 588
Alt. 2 Eliminate Livestock				
Initial Implementation	-1,195	--	--	-1,195
Long Term	-1,195	+48.1	--	-1,147
Alt. 3 Optimize Livestock				
Initial Implementation	+ 59	--	+3,486	+3,545
Long Term	+1,617	-67.0	--	+1,550
Alt. 4 Optimize Horses				
Initial Implementation	- 201	--	+ 888	+ 687
Long Term	+ 212	+ 4.1	--	+ 216
Alt. 5 Optimize Wildlife				
Initial Implementation	- 137	--	+1,255	+1,118
Long Term	+ 390	+12.4	--	+ 402

1/ No changes for Alternative 1.
2/ Construction income is treated as if it was evenly spread over the first 10-year period.

Table 3-31 Summary of Changes in Local Employment

Alternative Action 1/	Grazing	Recreation	Construction 2/	Total
Proposed Action:				
Initial Implementation	+ 6	--	+ 68	+ 74
Long Term	+ 95	+ 2	--	+ 97
Alt. 2 Eliminate Livestock				
Initial Implementation	-199	--	--	-199
Long Term	-199	+ 9	--	-190
Alt. 3 Optimize Livestock				
Initial Implementation	+ 9	--	+214	+223
Long Term	+267	-10	--	+257
Alt. 4 Optimize Horses				
Initial Implementation	- 34	--	+ 54	+ 20
Long Term	- 34	+ 2	--	- 32
Alt. 5 Optimize Wildlife				
Initial Implementation	- 22	--	+ 77	+ 55
Long Term	+ 66	+ 3	--	+ 63

1/ No changes for Alternative 1.
2/ Construction employment is treated as if it were spread over the first 10-year period.

ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

This section presents an analysis of the unavoidable adverse impacts which would result from the proposed action. Project design features discussed in Chapter 1 constitute best management practices; therefore, no additional mitigating measures are proposed.

Range trend on 136,650 acres would decline. An additional 91 acres of riparian vegetation would also deteriorate. Residual ground cover would decrease on 133,402 acres. A short-term reduction of vegetative ground cover would occur on 1,603 acres and a long-term loss of vegetative ground cover would occur on 151 acres from construction of range improvements. Threatened and endangered plants not identified in site-specific surveys could be impacted.

The construction of range improvements would temporarily expose 223,695.6 acres to erosion. Wind erosion would occur on 5,760 acres of Sandy and Ashey soils proposed for burning. Livestock concentration around the proposed water developments would expose 1,500 acres to erosion. The construction of range improvements would result in a short-term increase in sediment yield of 1.24 percent over the present situation.

Downward trend along 2 miles of stream would result in decreased fish production. Downward trend on 12 riparian acres would result in decreased animal diversity and numbers. Forage competition between big game and livestock would occur on approximately 17,000 acres of crucial deer winter range and 5,000 acres of crucial antelope range because of early turnout dates (3/1 - 4/15). Vegetation manipulation on about 263,000 acres of sagebrush would decrease associated small animal numbers and populations.

Slight decreases in sightseeing are expected due to increased visual contrasts. In some specific localities, range improvements would result in slight visitor use reduction. High quality activities impacted include hunting, fishing, hiking, horseback riding, historic and zoologic sightseeing. Adverse effects on total long-term area-wide recreational use would be minimal.

Unidentified cultural sites would be susceptible to artifact breakage, chipping, displacement and contamination as a result of ground disturbance. The integrity of known cultural sites would be degraded as their settings are impacted.

Scenic quality and visual resources would be degraded due to the construction of certain range improvements and vegetative manipulations in VRM Class II and III foreground-middleground areas.

The construction of range improvements would temporarily disturb wild horses. Construction of 108 miles of fence may cause injuries to horses.

The initial vegetation allocation would result in a net loss of 7,162 AUMs. One operator would have a loss in permitted use greater than 10 percent of annual livestock forage needs.

Initial project construction during the 10-year implementation period would consume 1.13 trillion Btu's of energy. Annual project maintenance would consume 10.9 billion Btu's.

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section analyzes the trade-offs between short-term use and long-term productivity for the proposed action. Initially, there would be a net decrease of 7,162 AUMs in forage available for livestock use. This decrease in use of the vegetation would, in the long term, act to increase plant vigor and percent composition of key plant species. This would result in an increase in residual ground cover, which would lead to a decrease in erosion and sediment yield in streams. The increased residual cover would provide improved habitat for wildlife and improve range condition and productivity. Forage available for livestock would be increased by 56,494 AUMs, increasing the income to operators and the local economy by $588,000 annually.

The construction of range improvements would increase erosion and sediment yield, contrast visually with landscape elements and displace some animals over the short term. As vegetation became reestablished on disturbed areas, erosion and sediment yield would decrease. About 150 acres would be lost to vegetation production.

Construction of 147 reservoirs would reduce the amount of water reaching downstream users in the short and long term, but not significantly.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

This section identifies the extent to which the proposed action would irreversibly limit the potential uses of the land and resources.

The 151 acres which would be occupied by the range improvements would lose their capacity to produce vegetation for the life of the improvement, which would be an irretrievable commitment of the vegetation resource. Disturbance of the soil surface during the construction of range improvements would cause an irretrievable loss of soil resulting in a 1.24 percent increase in sediment yield in streams.

Proposed livestock grazing and range developments could disturb certain cultural resources. Once disturbed, the functional and morphological data available from these archeologic and historic sites could be biased. Scientific value of these sites would diminish. The resulting data gap for the area's history would be an irretrievable commitment.

Energy would be irretrievably committed to install, operate and maintain range improvements. The initial investment of 1.13 trillion Btu's for improvement construction during the implementation period and the annual investment of 10.9 billion Btu's for project maintenance represent an irretrievable reduction of supplies of petroleum-derived energy.

LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

Comments on the DEIS will be requested from the following agencies and interest groups:

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
  Forest Service
  Soil Conservation Service
Department of Defense
  U.S. Army Corps of Engineers
Department of Energy
  Region X
Department of the Interior
  Fish and Wildlife Service
  Geological Survey
  Heritage Conservation and Recreation Service
  Bureau of Mines
  Water and Power Resources Service
Environmental Protection Agency

State and Local Government

Harney County Planning Commission
Klamath County Planning Commission
Lake County Planning Commission
IDA-ORE Regional Planning and Development Association
Klamath-Lake County Planning and Coordinating Council
Oregon State Clearinghouse
Oregon State Historic Preservation Officer

Interest Groups

All Grazing Permittees in the Lakeview EIS Area
American Fisheries Society
American Horse Protection Association
Desert Trails Association
Natural Resources Defense Council
National Wildlife Federation
Oregon Cattlemen's Association
Oregon Environmental Council
Oregon High Desert Study Group
Oregon Natural Heritage Program
Oregon Student Public Interest Research Group
Oregon Sheepgrowers
Public Lands Council
Sagecounty Alliance for a Good Environment (SAGE)
Sierra Club
Society for Range Management Management
Southern Oregon Resource Alliance (SORA)
The Wilderness Society
Wildlife Management Institute
Wildlife Society, Oregon Chapter

Copies of this draft environmental impact statement will be available for public inspection at the following BLM offices:

Washington Office of Public Affairs
18th and C Streets
Washington, DC 20240
Phone (202) 343-5717

Lakeview District Office
1000 Ninth St. S.
P.O. Box 151
Lakeview, Oregon 97630
Phone (503) 947-2177

Oregon State Public Affairs Office
729 N.E. Oregon Street
P.O. Box 2965
Portland, Oregon 97208
Phone (503) 231-6277

Reading copies will be placed in the following libraries: Oregon Institute of Technology, Klamath Falls; Portland State University, Portland; Oregon State University, Corvallis; University of Oregon, Eugene; Central Oregon Community College, Bend; and the Harney, Klamath and Lake County Libraries.

Public hearings will be held in Lakeview, Oregon, on the adequacy, completeness, and accuracy of this environmental impact statement. The hearings will not address the advantages or disadvantages of the proposed action, but opinions are and will be solicited on the quality of the analysis.

Details of the hearing will be published in the Federal Register and local news sources.

LIST OF PREPARERS

While individuals have primary responsibility for preparing sections of an EIS, the document is an interdisciplinary team effort. In addition, internal review of the document occurs throughout preparation. Specialists at the District, State Office and Washington Office levels of the Bureau both review the analysis and supply information. Contributions by individual preparers may be subject to revision by other BLM specialists and by management during the internal review process.

Name	Primary Responsibility	Discipline	Related Professional Experience
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Gerry Fullerton	Team Leader	Range Conservation	19 years, BLM (Range Conservationist, Natural Resource Specialist, Environmental Specialist)
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Jeanne Johnson	Editorial Assistant	Administrative Secretary	4 years, BLM (Secretary, Editorial Assistant)
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Joseph V. H. Ross	Recreation, Cultural Resources, Wilderness, Ecologically Significant Areas, Visual Resources and Energy	Recreation	6 years (Forestry Technician, Biological Information Specialist, Outdoor Recreation Planner)
Ron Smith	Team Manager	Forest Management	23 years BLM (Forester, Outdoor Recreation Planner, Supervisory Environmental Protection Specialist)

APPENDICES

APPENDICES

Appendix A

Lakeview Public Scoping Meeting

A public meeting was held in Lakeview on September 3, 1980, for scoping the Lakeview Grazing Management Environmental Impact Statement (EIS). Comments received at that meeting established a rather solid consensus that the EIS should address an alternative that called for a higher level of grazing than the proposed action. That alternative, to be called Optimize Livestock Grazing, would differ from the proposed grazing management program in the following ways:

- Protecting riparian areas on live streams only to the extent needed to meet Federal and State water quality standards and maintain existing quality where streams are above standards.

- Managing the Paisley and Beatys Butte wild horse herds for maintenance of a herd size of 30 animals each.

- Developing all practical and economically feasible range improvements for the benefit of wildlife and livestock.

There was no consistent support at the Lakeview meeting for discussion of any alternative involving a lower level of grazing than that in the District Manager's proposal. The specific comments received, however, suggested a lower level alternative that differed from the proposed action in the following ways:

- Limiting utilization of key species to 40 percent on sites with a soil surface factor of 41 or more; and to 50 percent utilization on sites with a soil surface factor of less than 41.

- Managing the Paisley and Beatys Butte wild horse herds for maintenance of a herd size of only 30 animals each.

A number of suggestions for other alternatives were made by one or another work group at the Lakeview meeting. The relevance of each is discussed below:

- Optimize vegetation, water and soil. This would basically be the same as the optimize wildlife and nonconsumptive uses alternative.

- Implement the stewardship program at an accelerated pace. Opportunities to implement the stewardship program already exist in both the proposed action and the Optimize Livestock Grazing alternative. The level of the stewardship program, however, is a matter of Bureau range management policy, which is not appropriate for discussion in a geographically specific EIS.

- Exclude game from livestock ranges. This alternative is not appropriate, as the State manages game.

- No reduction in grazing allocations until implementation and completion of management and treatment. The short-term impacts of this option would be the same as those of the mandatory No Action alternative. The long-term impacts would be the same as those of the proposed action. The impacts of such an alternative will therefore be analyzed in the EIS and it would be a selectable option if consistent with law and Bureau policy at the time of the decision.

- Emphasis on blocking land ownership. The District's proposed management framework plan places considerable emphasis on such blocking. Varying degrees of emphasis on blocking in the plan would not eliminate the need to manage the lands until an appropriate exchange program, which will take some time, can be completed. Thus, a different emphasis on blocking ownership would not significantly modify the proposed action that will be discussed in the EIS. That is, it would not define a different grazing management program.

- Dispose of Federal land to private ownership as contemplated before passage of the Federal Land Policy and Management Act. This proposal, which would require a major change in the law, is beyond the scope of a geographically specific EIS on grazing management.

In discussion at the public meeting, it was pointed out that the law requires the EIS to address a range of alternatives, and that the range should extend on both sides of the proposed level of livestock grazing. Alternatives were discussed which would identify a lower level of livestock grazing by optimizing other values, such as wild horses, wildlife and nonconsumptive uses. There was little support at the meeting, however, for analysis of any such alternative.

One letter received in response to the scoping notice suggested consideration of a specific option -- a 10 percent across-the-board cut in livestock grazing. This was considered, but BLM felt it is more appropriate to relate alternatives to resource management objectives than to base them on arbitrary changes in levels of grazing use.

Separate comment from a member of the Oregon Environmental Council favored analyzing an alternative to optimize wild horses and another alternative to optimize wildlife and nonconsumptive uses. It suggested that the latter contain the following elements, different from the proposed action:

1. Excluding livestock from all identified riparian areas, except at water gaps.

2. Excluding livestock from 26,000 acres of bighorn sheep seasonal and migratory ranges, and 19,500 acres of crucial deer winter range.

3. Limiting utilization of key species to 40 percent on sites with a soil surface factor of 41 or more; and to 50 percent utilization on sites with a soil surface factor of 40 or less.

4. Managing the Paisley and Beatys Butte wild horse herds for maintenance of a herd size of 30 animals each.

5. Protecting wet meadows.

6. Limiting size of seedings.

7. Using only burning as the method to remove existing vegetation before seeding.

The first six of these are considered to be practical elements of such an alternative. The sixth, however, cannot be given precise definition that would display a difference from the proposed action, as the proposed action already calls for seedings to be limited in size and design to meet objectives for the management of other resources including wildlife. The seventh, "burn only", cannot adequately be quantified for impact analysis, because only site specific planning will show which of the areas proposed for vegetative manipulation can feasibly be burned. However, the alternative can be defined as vegetation removal by burning on all sites which will carry a fire except on erodible soils.

Alternatives to be analyzed in the EIS were discussed at the September 16 meeting of the District's Multiple Use Advisory Council. The council recommended that, in addition to the mandatory No Action and No Grazing alternatives and the higher level of grazing alternative defined at the public meeting, the EIS should analyze the following two alternatives.

- An alternative that would optimize wildlife and nonconsuptive uses.

- An alternative that would optimize wild horse numbers on existing herd units. It would differ from the proposed action by removing livestock from the Paisley and Beatys Butte wild horse herd management areas to allow maximum wild horse numbers (600 in Paisley, 1,500 in Beatys Butte) consistent with maintenance of wildlife and other amenity values as defined in the proposed action.

Based on this advice, the EIS will analyze the following alternatives:

- Proposed Action

- No Action

- No Grazing

- Optimize Livestock Grazing (as defined on Page A-1)

- Optimize Wild Horses

- Optimize Wildlife and Nonconsumptive Uses (essentially in the first four elements on the previous page, the fifth and sixth elements being included by implicit definition of details of the alternative). The seventh element would be vegetation removal by burning on all sites which will carry a fire except on erodible soils.

Appendix B

Allotment-Specific Tables

Table B-1 Proposed Management, Period of Use and Initial Vegetation Allocation

Allotment Number and Name	Public Lands (acres)	Other Lands (acres)	Existing Period of Use 1/	Proposed Period of Use 1/	Present Forage Production (AUMs)	Proposed Initial Allocation				1979 Active Preference (AUMs)	Proposed Livestock Adjustment (AUMs)
						Wildlife (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)		
100 PETER CREEK	13,800	640	04/15-11/15	04/15-11/15	1,017	30	0	0	987	987	0
101 EAST GREEN MOUNTAIN	17,241	1,440	04/21-10/31	04/21-10/31	1,295	315	0	0	980	980	0
102 CRACK IN THE GROUND	15,419	400	05/01-09/15	05/01-09/15	441	143	0	0	298	298	0
103 VIEWPOINT	524,180	54,640	03/01-10/31	03/01-10/31	30,323	529	408	217	29,169	32,657	-3,488
104 BOTTOMLESS LAKE	565	0	06/01-09/30	06/01-09/30	51	0	0	1	50	0	50
200 BLUE CREEK	600	0	05/15-11/30	05/15-11/30	181	50	0	0	131	0	131
201 VINYARD INDIV	8,600	160	04/07-09/15	04/07-09/15	650	112	0	28	510	510	0
202 HICKEY INDIV	10,906	90	04/15-09/15	04/15-09/15	687	102	0	66	519	519	0
203 O'KEEFFE	565	0	-	-	48	2	0	0	46	48	-2
204 CRUMP INDIV	2,930	395	04/15-06/15	04/15-06/15	142	50	0	0	92	92	0
205 GREASER DRIFT	9,210	0	09/01-11/15	09/01-11/15	306	100	0	0	206	256	-50
206 LANE PLAN II	9,910	3,330	04/07-07/15	04/15-07/15	596	146	0	0	450	408	42
207 LANE PLAN I	24,725	1,370	04/07-09/15	04/07-09/15	2,240	200	0	98	1,942	1,942	0
208 SAGEHEN	3,820	2,050	06/15-10/07	07/07-10/15	326	60	0	0	266	266	0
209 SCHADLER	790	0	-	-	77	20	0	0	57	57	0
210 GRIENER INDIV	2,990	680	04/07-08/15	04/07-08/15	121	30	0	0	91	91	0
211 ROUND MOUNTAIN	16,330	1,640	04/07-06/30	04/07-06/30	1,407	183	0	122	1,102	1,102	0
212 RAHILLY-GRAVELLY	33,285	2,031	03/15-09/15	03/15-09/15	1,995	111	0	103	1,781	1,781	0
213 BURRO SPRING	7,500	0	12/01-03/15	12/01-03/15	360	60	0	21	279	0	279
215 HILL CAMP	30,790	2,710	04/01-10/15	04/01-10/15	4,182	300	0	0	3,882	3,932	-50
216 O'KEEFFE INDIV	50,330	3,010	03/15-09/15	03/15-09/15	5,058	266	0	0	4,792	4,808	-16
217 COX INDIV	4,670	60	04/15-04/14	04/15-04/14	444	70	0	74	300	217	83
218 SANDY SEEDING	4,850	0	03/21-04/30	03/21-04/30	430	30	0	45	355	0	355
219 CAHILL	470	0	-	-	300	20	0	0	280	280	0
222 FISHER LAKE	4,230	656	11/15-03/15	11/15-03/15	644	50	0	65	529	429	100
223 HICKEY	412	0	-	-	125	61	0	0	64	64	0
400 PAISLEY COMMON	551,620	13,004	03/01-02/28	03/15-01/31	16,861	251	612	0	15,998	19,119	-3,121
401 FENCED FED. LAND	160	520	03/01-04/30	03/01-04/30	16	0	0	0	16	16	0
403 PINE CREEK	400	1,160	04/15-06/15	04/15-06/15	20	2	0	0	18	18	0
404 WILLOW CREEK	3,123	4,220	04/15-06/15	04/15-06/15	66	2	0	0	64	63	1
405 EAST CLOVER FLAT	8,682	5,246	04/15-06/15	04/15-06/15	290	8	0	0	282	526	-244
406 WEST CLOVER FLAT	748	2,776	05/01-05/31	05/01-05/31	17	2	0	0	15	15	0
407 CLOVER FLAT	2,521	4,851	04/15-05/21	04/15-05/21	220	20	0	0	200	90	110
408 SCHOOL HOUSE	55	1,980	05/01-05/31	05/01-05/31	2	0	0	0	2	2	0
409 TUCKER HILL	3,534	323	04/15-05/15	04/15-05/15	136	0	0	0	136	46	90
410 TIM LONG CREEK	285	1,155	04/15-05/15	04/15-05/15	13	0	0	0	13	13	0
411 JONES CANYON	636	0	05/01-05/31	05/01-05/31	13	0	0	0	13	113	-100
412 FIR TIMBER BUTTE	1,773	3,045	05/01-06/15	05/01-06/15	143	14	0	0	129	132	-3
413 MILL CREEK	1,689	127	05/01-05/31	05/01-06/15	78	8	0	0	70	67	3
415 BRIGGS GARDEN	785	899	05/01-05/31	05/01-05/31	49	7	0	0	42	42	0
416 WHITE ROCK	565	438	05/01-06/30	05/01-06/30	11	1	0	0	10	10	0
417 C & J USE AREA	849	1,135	04/15-06/15	04/15-12/31	9	0	0	0	9	5	4
501 FLYNN	2,780	0	-	-	175	55	0	0	120	120	0
502 FITZGERALD	5,150	0	-	-	406	60	0	0	346	346	0
503 TAYLOR	3,110	0	-	-	307	60	0	0	247	295	-48
504 KIELY	390	0	-	-	23	0	0	0	23	23	0
505 LYNCH	180	0	-	-	20	0	0	0	20	20	0
506 MCKEE	100	0	-	-	10	0	0	0	10	10	0

Table B-1 Proposed Management, Period of Use and Initial Vegetation Allocation (Cont.)

Allotment Number and Name	Public Lands (acres)	Other Lands (acres)	Existing Period of Use 1/	Proposed Period of Use 1/	Present Forage Production (AUMs)	Proposed Initial Allocation				1979 Active Preference (AUMs)	Proposed Livestock Adjustment (AUMs)
						Wildlife (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)		
507 LAIRD	2,030	400	-	-	214	50	0	0	164	164	0
508 ROCK CREEK RANCH	280	0	-	-	9	0	0	0	9	9	0
509 COX BUTTE	38,340	1,920	03/15-10/20	03/15-10/20	1,259	63	0	0	1,196	1,196	0
510 ORIJANA RIM	57,280	3,520	04/01-11/01	04/01-10/31	1,565	100	0	42	1,423	1,423	0
511 NORTHEAST WARNER	138,320	8,580	03/01-08/15	02/01-09/30	5,968	12	0	0	5,956	5,956	0
512 NORTH BLUEJOINT	22,440	3,640	05/01-07/31	10/01-12/31	740	100	0	351	289	289	0
514 CORN LAKE	78,410	3,960	03/21-09/10	03/21-09/30	2,763	40	0	60	2,663	2,663	0
515 JUNIPER MOUNTAIN	91,720	760	04/01-09/29	04/01-09/29	4,006	116	0	269	3,621	3,621	0
516 RABBIT BASIN	60,540	940	02/01-03/26	12/01-06/15	810	26	0	214	570	570	0
517 COYOTE-COLVIN	127,596	17,002	03/16-11/15	12/01-10/31	5,127	87	0	0	5,040	5,209	-169
518 CLOVER CREEK	10,050	1,834	06/01-11/01	06/01-11/01	443	8	0	0	435	435	0
519 FISH CREEK	14,805	11,926	04/16-10/31	05/01-10/31	667	44	0	0	623	498	125
520 LYNCH-FLYNN	17,320	4,540	04/19-08/09	05/01-07/15	964	55	0	0	909	867	42
521 PRIDAY RESERVOIR	780	720	04/01-08/01	08/01-09/30	204	139	0	0	65	30	35
522 ABERT SEEDING	9,200	320	03/16-06/20	03/16-06/20	2,561	60	0	0	2,501	2,501	0
523 WARNER LAKES	39,268	6,090	04/01-10/15	04/16-10/15	2,021	50	0	315	1,656	1,489	167
524 LANE INDIV	2,700	0	-	-	115	50	0	0	65	65	0
600 BEATYS BUTTE	506,985	46,455	04/01-11/30	04/01-12/15	28,965	444	2,400	0	26,121	27,892	-1,771
700 SILVER CR-BRIDGE CR	6,645	265	04/21-01/15	04/21-06/21	331	69	0	0	262	262	0
701 UPPER BRIDGE CR	1,460	3,270	04/01-10/09	03/01-10/07	137	29	0	0	108	108	0
702 BUCK CR-BRIDGE CR	6,280	375	05/01-09/30	05/01-09/30	463	142	0	12	309	309	0
703 BEAR CREEK	1,155	990	04/28-06/28	04/28-06/28	143	36	0	0	107	107	0
704 WARD LAKE	12,424	1,819	04/28-06/27	04/28-06/27	837	187	0	0	650	650	0
705 OATMAN FLAT	21,983	4,275	03/01-06/30	03/01-06/30	1,739	463	0	0	1,276	1,332	-56
706 RYE RANCH	4,240	0	05/19-10/31	05/21-10/31	669	130	0	0	539	539	0
707 TUFF BUTTE	9,330	2,310	05/01-06/30	05/01-12/15	876	340	0	0	536	376	160
708 ARROW GAP	2,720	160	04/15-06/15	04/15-06/15	135	0	0	0	135	135	0
709 DEAD INDIAN-DUNCAN	18,790	2,420	04/01-09/30	04/01-09/30	1,233	647	0	0	586	586	0
710 MURDOCK	4,468	1,668	05/01-06/30	05/01-06/30	617	72	0	0	545	705	-160
711 SOUTH HAYES BUTTE	1,170	0	05/01-05/31	05/01-06/15	88	16	0	0	72	72	0
712 BRIDGE WELL	1,400	1,050	04/15-05/15	04/15-05/15	149	99	0	0	50	50	0
713 SILVER CREEK	2,785	640	04/15-05/31	04/15-05/31	262	62	0	0	200	200	0
714 TABLE ROCK	4,100	120	-	-	173	173	0	0	0	250	-250
715 CONNELLY HILLS	6,520	1,800	03/01-05/15	03/01-05/15	1,101	295	0	0	806	750	56
716 SILVER LAKE LAKEBED	640	0	11/01-12/31	11/01-12/31	250	0	0	0	250	0	250
800 ADAMS	40	0	05/15-10/31	05/15-10/31	6	0	0	0	6	6	0
801 HAUGHT	400	0	05/01-07/31	05/01-07/31	31	4	0	0	27	27	0
804 BAR CL	480	0	05/01-10/31	05/01-10/31	48	6	0	0	42	42	0
806 TWO MILE	817	0	05/01-09/30	05/01-09/30	92	12	0	0	80	80	0
807 BARNWELL	1,708	0	04/15-06/30	04/15-06/30	115	15	0	0	100	100	0
808 LEE	40	0	06/01-08/15	06/01-08/15	11	1	0	0	10	10	0
809 BROWN	80	0	06/01-08/30	06/01-08/31	34	4	0	0	30	30	0
810 BRENDA	1,300	0	05/16-06/30	05/16-06/30	142	18	0	0	124	124	0
811 CHEYNE	840	0	05/01-06/15	05/01-06/15	55	4	0	0	51	51	0
812 STUKEL-COFFIN	760	0	05/15-06/30	05/15-06/30	62	7	0	0	55	55	0
813 PLUM HILLS	160	0	04/16-06/30	04/16-06/30	23	3	0	0	20	20	0
814 CUNNINGHAM	840	0	04/26-07/15	04/26-07/15	124	16	0	0	108	108	0
815 STUKEL-DEHLINGER C.	1,680	0	04/16-09/15	04/16-09/15	269	29	0	0	240	240	0

Table B-1 Proposed Management, Period of Use and Initial Vegetation Allocation (Cont.)

Allotment Number and Name	Public Lands (acres)	Other Lands (acres)	Existing Period of Use 1/	Proposed Period of Use 1/	Present Forage Production (AUMs)	Proposed Initial Allocation				1979 Active Preference (AUMs)	Proposed Livestock Adjustment (AUMs)
						Wildlife (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)		
816 STUKEL-DEHLINGER H.	440	0	05/10-08/10	05/10-08/10	34	4	0	0	30	30	0
817 DREW	1,080	0	06/01-10/15	06/01-10/15	124	16	0	0	108	108	0
818 BRYANT-DUNCAN	200	0	05/01-05/31	05/01-05/31	17	2	0	0	15	15	0
819 DUPONT	79	0	04/15-06/01	04/15-06/01	8	1	0	0	7	7	0
820 FLESHER	160	0	05/01-07/31	05/01-07/31	18	2	0	0	16	16	0
821 NORTH HORSEFLY	988	0	05/01-06/15	05/01-06/15	95	27	0	0	68	68	0
822 STUKEL-O'NEILL	3,122	0	04/16-09/30	04/16-09/30	234	25	0	0	209	209	0
823 NO. HORSEFLY	920	0	06/16-08/01	06/16-08/01	83	23	0	0	60	60	0
825 NAYLOX	760	0	06/01-09/30	06/01-09/30	88	12	0	0	76	76	0
826 HASKINS	560	0	04/16-05/15	04/16-05/15	86	6	0	0	80	80	0
827 STUKEL-HIGH	349	0	04/16-09/30	04/16-09/30	28	3	0	0	25	25	0
828 STUKEL-HILL	960	0	04/16-07/15	04/16-07/15	67	7	0	0	60	60	0
829 HORTON	760	0	04/15-06/30	04/15-06/30	30	4	0	0	26	26	0
830 HUNGRY HOLLOW	280	0	06/01-08/31	06/01-08/31	43	3	0	0	40	40	0
831 WARLOW	460	0	05/01-09/30	05/01-09/30	57	7	0	0	50	50	0
832 JESPERSON	1,578	0	05/01-07/01	05/01-07/01	181	23	0	0	158	158	0
833 BRYANT-JOHNSON	40	0	06/01-09/30	05/01-09/30	7	1	0	0	6	6	0
834 KELLISON	335	0	04/16-06/15	04/16-06/15	20	1	0	0	19	19	0
835 KETCHAM	320	0	05/01-07/31	05/01-07/31	23	3	0	0	20	20	0
836 HARPOLD CHAINING	900	0	04/10-05/15	04/21-05/31	110	14	0	0	96	96	0
837 BRYANT-HORTON	1,249	0	04/16-08/31	05/16-09/30	148	18	0	0	130	130	0
838 WINDY RIDGE	600	0	05/01-05/31	05/01-05/31	61	9	0	0	52	52	0
839 BRYANT-LOVELESS	3,440	0	05/01-09/30	05/01-09/30	561	71	0	0	490	490	0
840 BRYANT-LYON	565	0	05/01-09/30	05/01-09/30	43	5	0	0	38	38	0
841 MARSHALL	348	0	04/16-05/30	04/16-05/30	16	2	0	0	14	14	0
842 MASTEN	485	0	05/01-06/30	05/01-06/30	43	3	0	0	40	40	0
845 KLMTH HILLS-O'CONNOR	500	0	04/01-05/31	04/01-05/31	58	3	0	0	55	55	0
846 OK	1,260	0	05/01-06/30	05/01-06/30	149	9	0	0	140	140	0
847 OWENS	1,921	0	05/01-12/31	05/01-12/31	151	43	0	0	108	108	0
848 POPE	1,044	0	05/01-09/30	05/01-09/30	78	8	0	0	70	70	0
849 RAJNUS BROS.	480	0	04/15-08/31	04/15-08/31	36	4	0	0	32	32	0
851 HARPOLD RIDGE	1,083	0	04/10-05/20	04/21-06/30	126	16	0	0	110	110	0
852 RODGERS	2,549	0	07/01-09/30	07/01-09/30	280	31	0	0	249	249	0
853 7C	688	0	05/01-06/30	05/01-06/30	145	41	0	0	104	104	0
855 BRYANT-SMITH	1,140	0	05/15-08/31	05/16-08/31	124	15	0	0	109	109	0
856 BRYANT-STASTNY	440	0	05/10-09/30	04/21-09/30	80	10	0	0	70	70	0
857 BRYANT-TAYLOR	760	0	04/15-09/30	04/21-09/30	48	6	0	0	42	42	0
858 VENABLE & BIAGGI	6,448	0	05/01-06/30	05/01-06/30	344	44	0	0	300	300	0
859 CUNARD	370	0	05/01-07/31	05/01-07/31	67	7	0	0	60	60	0
860 MCCARTIE	545	0	05/01-05/10	05/01-05/10	89	6	0	0	83	83	0
861 WILLIAMS	2,520	0	05/01-09/30	05/01-09/30	129	9	0	0	120	120	0
862 KLAMATH FOREST EST.	2,520	0	06/01-06/15	06/01-06/15	91	6	0	0	85	85	0
863 WIRTH	1,360	0	05/01-10/31	05/01-10/31	131	18	0	0	113	113	0
864 RAJNUS & SON	1,440	0	05/01-06/30	05/01-06/30	126	16	0	0	110	110	0
876 BEAR VALLEY	4,800	4,729	07/01-09/30	07/16-10/15	593	118	0	0	475	475	0
877 BUMPHEADS	12,880	580	04/21-06/30	04/21-06/30	895	131	0	0	764	764	0
878 CAMPBELL	1,465	3,140	05/01-10/26	05/01-10/26	47	0	0	0	47	47	0
879 DEVAUL	240	320	05/01-08/31	05/01-08/31	14	2	0	0	12	12	0

Table B-1 Proposed Management, Period of Use and Initial Vegetation Allocation (Cont.)

Allotment Number and Name	Public Lands (acres)	Other Lands (acres)	Existing Period of Use 1/	Proposed Period of Use 1/	Present Forage Production (AUMs)	Proposed Initial Allocation				1979 Active Preference (AUMs)	Proposed Livestock Adjustment (AUMs)
						Wildlife (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)		
881 GOODLOW	285	640	05/01-08/31	05/01-08/31	33	1	0	0	32	32	0
882 HORSEFLY	26,356	4,729	04/21-10/15	04/21-10/15	3,004	546	0	0	2,458	2,458	0
883 HORTON	880	342	04/16-05/15	04/16-05/15	58	0	0	0	58	58	0
884 LANE	282	388	05/15-08/31	05/15-08/31	44	1	0	0	43	43	0
885 DRY PRAIRIE	7,231	3,624	05/01-09/01	05/01-09/01	736	130	0	0	606	606	0
886 HORSE CAMP RIM	5,120	0	05/01-07/31	05/01-07/31	351	51	0	0	300	300	0
887 PITCHLOG	9,280	1,040	05/01-06/30	05/01-06/30	524	90	0	0	434	434	0
888 ROCK CREEK	2,750	1,200	05/01-05/31	05/01-05/31	262	46	0	0	216	216	0
889 TIMBER HILL	3,390	1,364	07/01-09/30	04/21-05/31	325	55	0	0	270	270	0
890 WILLOW VALLEY	14,945	1,520	04/15-06/15	04/21-10/15	1,490	220	0	0	1,270	1,270	0
891 WILLOW VALLEY CHAIN.	3,909	497	04/21-05/15	04/21-05/31	170	65	0	0	105	105	0
892 WILLIAMS	1,790	0	05/01-05/20	05/01-05/20	75	0	0	0	75	75	0
893 FIELDS	180	0	04/21-05/20	04/21-05/20	7	1	0	0	6	6	0
895 HARPOLD CANYON	1,080	0	04/15-09/30	04/21-09/30	123	15	0	0	108	108	0
896 MCFALL	880	0	05/01-10/31	05/01-10/31	100	12	0	0	88	88	0
900 FREMONT	26,362	511	04/15-09/30	04/15-09/30	3,199	1,229	0	0	1,970	1,970	0
901 WASTINA	6,366	0	05/01-10/31	05/01-10/31	730	311	0	0	419	419	0
902 CINDER BUTTE	11,216	320	03/15-11/07	03/15-11/07	1,557	634	0	0	923	923	0
903 BEASLEY LAKE	2,640	534	-	10/15-12/15	298	66	0	0	232	232	0
904 HIGHWAY	3,675	989	02/01-10/31	02/01-10/31	335	91	0	0	244	244	0
905 HOMESTEAD	13,837	9,728	05/01-10/31	05/01-10/31	1,313	508	0	0	805	805	0
906 NORTH WEBSTER	1,071	3,416	05/01-11/31	05/01-11/15	163	51	0	0	112	112	0
907 DEVILS GARDEN	4,406	0	05/21-09/30	05/21-09/30	403	116	0	0	287	0	287
908 COUGAR MOUNTAIN	8,282	3,405	05/15-01/31	05/01-02/15	1,150	534	0	0	616	616	0
909 BUTTON SPRINGS	8,779	1,240	05/15-10/15	06/15-10/15	1,320	252	0	0	1,068	1,068	0
910 HOGBACK BUTTE	4,384	4,234	04/21-11/21	04/21-11/21	862	182	0	0	680	680	0
911 VALLEY	6,600	769	05/01-01/31	05/01-01/31	806	137	0	0	669	669	0
912 EAST HAYES BUTTE	320	710	05/01-10/31	05/01-10/31	17	1	0	0	16	16	0
913 INDIVIDUAL	240	0	10/15-01/15	10/15-01/15	24	0	0	0	24	12	12
914 WEST GREEN MOUNTAIN	21,656	4,406	05/01-11/31	05/01-11/31	1,424	191	0	0	1,233	1,233	0
915 SQUAW BUTTE	8,230	460	05/01-08/31	05/01-08/31	1,535	535	0	0	1,000	1,000	0
916 WAHL	160	0	12/15-01/15	12/15-01/15	10	0	0	0	10	16	-6
1000 LITTLE JUNIPER SPR	116,836	780	04/01-10/15	04/01-11/15	8,856	480	0	2,958	5,418	5,418	0
1001 ALKALI WINTER	87,570	6,817	12/01-02/28	12/01-02/28	4,503	0	0	85	4,418	4,418	0
1002 BAR 75 RANCH	2,588	0	-	-	159	0	0	0	159	159	0
1300 BECRAFT	120	0	05/01-05/31	05/01-05/31	15	5	0	0	10	10	0
1301 CROOKED CREEK	240	0	05/01-06/30	05/01-06/30	15	5	0	0	10	10	0
1302 THOMAS CREEK	40	0	06/01-09/30	06/01-09/30	44	14	0	0	30	30	0
1303 O'KEEFFE	280	0	05/16-07/31	05/16-07/31	30	10	0	0	20	20	0
1305 SCHULTZ	200	0	05/16-09/15	05/16-09/15	43	14	0	0	29	29	0
1306 SIMMS	363	0	07/01-09/30	07/01-09/30	82	27	0	0	55	55	0
1307 VERNON	240	0	06/01-09/30	-	15	5	0	10	0	10	-10
1308 BARRY	120	0	05/01-05/31	05/01-05/31	4	0	0	0	4	4	0
UNALLOTTED	137,844		-	-	-	-	-	-	-	-	-
EIS TOTAL	3,342,026	291,072			183,187	15,319	3,420	5,156	159,292	166,454	-7,162

1/ No dates shown indicate Federal range fenced, non-use or elimination of grazing.

Table B-2 Existing and Proposed Grazing Systems 1/

Allot. No.	Spring		Spring/Summer		Spring/Fall		Deferred		Rotation		Deferred Rotation		Rest Rotation		Winter		Exclusion		FRF 2/	
	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.
100	0	0	13,800	0	0	0	0	0	0	0	0	0	0	13,800	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	1,060	1,060	16,181	16,181	0	0	0	0	0	0
102	0	0	0	8,815	0	0	0	0	0	0	0	0	15,419	6,604	0	0	0	0	0	0
103	48,208	119,763	180,859	0	0	0	15,966	22,682	120,939	0	0	90,019	151,648	285,156	0	0	0	6,560	0	0
104	0	0	565	565	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600
201	0	0	0	0	0	0	3,490	3,370	0	0	0	0	3,721	3,721	0	0	1	121	1,388	1,388
202	0	0	0	0	0	0	0	0	0	0	0	0	10,906	10,883	0	0	0	23	0	0
203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	561	561
204	0	0	2,930	0	0	0	0	0	0	0	0	0	0	2,930	0	0	0	0	0	0
205	0	0	0	0	0	0	7,370	7,370	0	0	0	0	0	0	0	0	1,840	1,840	0	0
206	0	0	0	0	0	0	760	760	0	0	0	0	9,150	8,880	0	0	0	270	0	0
207	1,238	1,238	0	0	0	0	0	0	0	0	0	0	23,465	23,395	0	0	22	92	0	0
208	0	0	0	0	0	0	3,819	3,819	0	0	0	0	0	0	0	0	1	1	0	0
209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	790	790
210	0	0	0	0	0	0	0	0	0	0	0	0	2,990	2,990	0	0	0	0	0	0
211	0	0	0	0	0	0	0	0	0	0	0	0	15,102	15,102	0	0	1,228	1,228	0	0
212	0	0	0	0	0	0	0	0	0	0	0	0	33,262	33,182	0	0	23	103	0	0
213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,499	7,499	1	1	0	0
215	0	0	0	0	0	0	0	0	0	0	0	0	30,772	30,772	0	0	18	18	0	0
216	0	0	0	0	0	0	10,065	10,065	0	0	0	0	39,935	39,775	0	0	330	490	0	0
217	0	0	0	0	0	0	0	0	0	0	3,335	3,335	0	0	1,335	1,335	0	0	0	0
218	0	0	0	0	0	0	0	0	0	0	0	0	4,850	4,850	0	0	0	0	0	0
219	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	470	470
222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,230	4,230	0	0	0	0
223	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	412	412
400	6,989	11,316	76,927	64,382	0	0	0	0	0	67,812	0	59,749	282,078	228,076	157,665	100,906	160	160	0	0
401	160	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
403	0	0	400	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
404	0	0	3,108	0	0	0	0	0	0	0	0	0	0	3,058	0	0	15	65	0	0
405	3,880	0	4,802	0	0	0	0	0	0	0	0	0	0	8,682	0	0	0	0	0	0
406	0	0	748	748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407	2,521	2,511	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0
408	0	0	55	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
409	3,534	3,534	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	285	285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
411	0	0	636	636	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
412	0	0	1,773	0	0	0	0	0	0	1,773	0	0	0	0	0	0	0	0	0	0
413	0	0	1,689	0	0	0	0	0	0	1,689	0	0	0	0	0	0	0	0	0	0
415	0	0	785	785	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
416	0	0	565	565	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
417	0	0	849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
501	0	0	0	0	0	0	0	0	0	0	0	849	0	0	0	0	0	0	0	0
502	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,780	2,780
503	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,150	5,150
504	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,110	3,110
505	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	390	390
506	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	180
																			100	100

Table B-2 Existing and Proposed Grazing Systems (Cont.)

Allot. No.	Spring		Spring/Summer		Spring/Fall		Deferred		Rotation		Deferred Rotation		Rest Rotation		Winter		Exclusion		FRF 2/	
	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.
507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,030	2,030
508	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	280
509	0	0	38,340	0	0	0	0	0	0	0	0	0	0	38,340	0	0	0	0	0	0
510	0	0	57,280	0	0	0	0	0	0	0	0	0	0	57,280	0	0	0	0	0	0
511	0	0	138,319	0	0	0	0	0	0	0	0	0	0	125,903	0	12,416	1	1	0	0
512	0	0	22,440	0	0	0	0	0	0	0	0	0	0	0	0	22,440	0	0	0	0
514	21,362	0	57,047	0	0	0	0	0	0	0	0	0	0	78,409	0	0	1	1	0	0
515	0	0	0	0	0	0	0	0	0	0	0	0	91,627	91,627	0	0	93	93	0	0
516	0	0	0	0	0	0	0	0	0	0	0	0	0	11,181	60,540	49,359	0	0	0	0
517	0	0	0	0	0	0	0	0	0	0	0	0	127,132	113,741	0	13,388	464	467	0	0
518	0	0	0	0	0	0	0	0	0	0	0	0	10,049	10,049	0	0	1	1	0	0
519	0	0	14,675	0	0	0	0	0	0	0	0	0	0	14,665	0	0	130	140	0	0
520	0	0	17,313	0	0	0	0	0	0	0	0	0	0	17,313	0	0	7	7	0	0
521	0	0	780	0	0	0	0	780	0	0	0	0	0	0	0	0	0	0	0	0
522	0	0	0	0	0	0	0	0	0	0	0	0	9,200	9,200	0	0	0	0	0	0
523	0	0	39,268	0	0	0	0	0	0	0	0	0	0	39,268	0	0	0	0	0	0
524	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,700	2,700
600	0	0	493,438	0	0	8,750	13,495	16,250	0	0	0	0	0	481,893	0	0	52	92	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	6,645	6,645	0	0	0	0	0	0
701	0	0	0	0	1,460	0	0	0	0	0	0	0	0	1,440	0	0	0	20	0	0
702	0	0	0	0	0	0	0	0	0	0	0	2,490	5,080	3,760	0	0	0	30	0	0
703	0	0	1,155	1,155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
704	0	0	0	0	0	0	0	0	0	0	0	0	12,424	12,424	0	0	0	0	0	0
705	0	0	8,090	8,090	0	0	0	0	0	0	0	0	13,893	13,893	0	0	0	0	0	0
706	0	0	0	0	0	0	0	0	0	0	4,240	1,500	0	2,740	0	0	0	0	0	0
707	0	0	9,330	0	0	0	0	790	0	0	0	0	0	8,540	0	0	0	0	0	0
708	0	0	2,720	2,720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
709	0	0	0	0	0	0	8,520	5,074	0	0	0	0	10,270	13,716	0	0	0	0	0	0
710	0	0	4,468	0	0	0	0	0	0	0	0	0	0	4,468	0	0	0	0	0	0
711	0	0	1,170	0	0	0	0	0	0	0	0	0	0	1,170	0	0	0	0	0	0
712	1,400	1,400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
713	0	0	2,785	2,785	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715	0	0	0	0	0	0	0	0	0	0	0	0	6,520	6,520	0	0	0	4,100	0	0
716	0	0	0	0	0	0	0	0	0	0	0	0	0	0	640	640	0	0	0	0
800	0	0	40	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
801	0	0	400	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
804	0	0	480	480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
806	0	0	817	817	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
807	0	0	1,708	1,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
808	0	0	40	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
809	0	0	80	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
810	0	0	1,300	1,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
811	0	0	840	0	0	0	0	0	0	0	0	0	0	840	0	0	0	0	0	0
812	0	0	760	760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813	0	0	160	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
814	0	0	840	840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
815	0	0	1,680	1,680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table B-2 Existing and Proposed Grazing Systems (Cont.)

Allot. No.	Spring		Spring/Summer		Spring/Fall		Deferred		Rotation		Deferred Rotation		Rest Rotation		Winter		Exclusion		FRF 2/	
	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.
816	0	0	440	440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
817	0	0	1,080	1,080	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
818	0	0	200	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
819	0	0	79	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	0	0	160	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
821	0	0	988	988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
822	0	0	3,122	3,122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
823	0	0	920	920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
825	0	0	760	760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
826	560	560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827	0	0	349	349	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
828	0	0	960	960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
829	0	0	760	760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
830	0	0	280	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
831	0	0	460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
832	0	0	1,578	1,578	0	0	0	0	0	0	0	0	0	460	0	0	0	0	0	0
833	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
834	0	0	335	335	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0
835	0	0	320	320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
836	900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
837	0	0	1,249	0	0	0	0	0	0	0	0	0	0	900	0	0	0	0	0	0
838	0	0	600	0	0	0	0	0	0	0	0	0	0	1,249	0	0	0	0	0	0
839	0	0	3,440	3,440	0	0	0	0	0	0	0	0	0	600	0	0	0	0	0	0
840	0	0	565	565	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841	0	0	348	348	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
842	0	0	485	485	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
845	0	0	500	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
846	0	0	1,260	1,260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
847	0	0	1,921	1,921	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
848	0	0	1,044	1,044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
849	0	0	480	480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
851	1,083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
852	0	0	0	0	0	0	2,549	2,549	0	0	0	0	0	1,083	0	0	0	0	0	0
853	0	0	688	688	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855	0	0	1,140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
856	0	0	440	0	0	0	0	0	0	0	0	0	0	1,140	0	0	0	0	0	0
857	0	0	760	0	0	0	0	0	0	0	0	0	0	440	0	0	0	0	0	0
858	0	0	0	0	0	0	0	0	0	0	0	0	0	760	0	0	0	0	0	0
859	0	0	370	370	0	0	0	0	0	0	0	0	6,447	6,447	0	0	1	1	0	0
860	545	545	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
861	0	0	1,280	1,280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
862	0	0	2,520	2,520	0	0	0	0	0	0	1,200	1,200	40	40	0	0	0	0	0	0
863	0	0	1,360	1,360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
864	0	0	1,440	1,440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
876	0	0	0	0	0	0	4,797	0	0	0	0	0	0	0	0	0	0	0	0	0
877	0	0	1,375	1,375	0	0	0	0	0	0	0	0	0	4,797	0	0	3	3	0	0
878	0	0	1,465	1,465	0	0	0	0	0	0	0	0	11,503	11,433	0	0	2	72	0	0
879	0	0	240	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
881	0	0	285	285	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table B-2 Existing and Proposed Grazing Systems (Cont.)

Allot. No.	Spring		Spring/Summer		Spring/Fall		Deferred		Rotation		Deferred Rotation		Rest Rotation		Winter		Exclusion		FRF 2/	
	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.	Ext.	Prop.
882	0	0	0	0	2,211	2,211	0	0	0	0	0	0	24,135	24,135	0	0	10	10	0	0
883	880	880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
884	0	0	282	282	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
885	0	0	0	0	0	0	2,135	2,135	0	0	0	0	5,094	5,094	0	0	2	2	0	0
886	0	0	0	0	0	0	0	0	0	0	2,675	2,675	2,445	2,445	0	0	0	0	0	0
887	0	0	0	0	0	0	0	0	0	0	0	0	9,280	9,280	0	0	0	0	0	0
888	0	0	2,750	0	0	0	0	0	0	0	0	0	0	2,750	0	0	0	0	0	0
889	0	0	0	0	0	0	3,390	0	0	0	0	0	0	3,390	0	0	0	0	0	0
890	0	0	0	0	14,936	0	0	0	0	0	0	0	0	14,936	0	0	9	9	0	0
891	3,909	0	0	0	0	0	0	0	0	0	0	0	0	3,909	0	0	0	0	0	0
892	1,790	1,790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
893	180	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
895	0	0	1,080	0	0	0	0	0	0	0	0	0	0	1,080	0	0	0	0	0	0
896	0	0	880	0	0	0	0	0	0	0	0	880	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	1,940	1,940	24,422	24,422	0	0	0	0	0	0
901	0	0	0	0	0	0	0	0	0	0	0	0	6,366	6,366	0	0	0	0	0	0
902	440	440	0	0	0	0	1,760	1,760	960	960	0	0	8,056	8,056	0	0	0	0	0	0
903	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,640	0	0	0	0
904	0	0	1,645	1,645	2,030	2,030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
905	0	0	0	0	0	0	7,052	0	0	0	0	0	0	13,837	0	0	0	0	0	0
906	0	0	1,071	0	0	0	0	0	0	0	0	0	0	1,071	0	0	0	0	0	0
907	0	0	0	0	0	0	0	0	0	0	0	0	4,406	4,406	0	0	0	0	0	0
908	0	0	3,945	0	0	0	0	477	0	0	0	0	0	3,945	4,177	3,700	160	160	0	0
909	0	0	0	0	0	0	0	0	0	0	0	0	8,779	8,779	0	0	0	0	0	0
910	0	0	0	0	0	0	0	0	0	0	0	0	4,384	4,384	0	0	0	0	0	0
911	0	0	0	0	0	0	0	0	0	0	0	0	1,953	1,953	4,647	4,647	0	0	0	0
912	0	0	320	320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	240	240	0	0	0	0
914	0	0	0	0	0	0	11,788	11,788	0	0	3,508	3,508	6,360	6,360	0	0	0	0	0	0
915	0	0	0	0	0	0	0	0	0	0	0	0	8,230	8,230	0	0	0	0	0	0
916	0	0	0	0	0	0	0	0	0	0	0	0	0	0	160	160	0	0	0	0
1000	0	0	114,199	0	0	0	0	0	0	0	0	0	2,630	116,829	0	0	7	7	0	0
1001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87,410	87,410	160	160	0	0
1002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,588	2,588
1300	0	0	120	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1301	0	0	240	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1302	0	0	40	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1303	0	0	280	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1305	0	0	200	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1306	0	0	0	0	0	0	0	0	0	0	0	0	363	363	0	0	0	0	0	0
1307	0	0	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	240	0	0
1308	0	0	120	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	99,864	144,602	1,373,752	136,650	21,237	12,991	96,956	89,669	121,899	72,234	17,958	169,205	1,067,212	2,208,471	328,543	311,010	4,746	16,602	22,929	23,529

1/ There are also 49,086 acres in 6 allotments (Allotment 103 - 6,560 acres; 400 - 27,801 acres; 702 - 1,200 acres; 714 - 4,100 acres; 903 - 2,640 acres; 905 - 6,785 acres) where no livestock use has occurred for at least 5 years. Non-use is proposed for 19,219 acres in Allotment 400.

2/ Federal Range Fenced.

Table B-3 Proposed Action Range Improvements

Allotment Number and Name	Fence (miles)	Springs	Pipeline (miles)	Wells	Guzzlers	Reservoirs	Waterholes	Seeding (acres) Spray	Seeding (acres) Burn	Seeding (acres) Chain	Brush Control (acres) Spray	Brush Control (acres) Burn	Brush Control (acres) Chain	Juniper Control (acres)
100 PETER CREEK	12.0	0	0.0	1	0	2	1	0	0	0	0	0	0	0
101 EAST GREEN MOUNTAIN	0.0	0	2.0	1	0	0	0	0	0	0	0	0	0	0
102 CRACK IN THE GROUND	7.0	0	2.0	0	0	0	0	0	0	0	0	0	0	0
*103 VIEWPOINT	63.0	2	27.0	3	18	2	12	31,903	20,870	0	0	0	0	0
202 HICKEY INDIV	0.0	0	0.0	0	1	2	1	0	200	0	0	280	0	0
204 CRUMP INDIV	1.0	1	1.0	0	0	0	0	300	0	0	0	0	0	0
*205 GREASER DRIFT	3.0	0	0.0	0	0	0	0	800	0	0	0	480	0	0
*206 LANE PLAN II	0.0	0	0.0	0	0	1	1	0	200	0	0	280	0	0
207 LANE PLAN I	0.0	1	0.0	0	0	0	3	0	360	0	0	1,640	0	0
210 GRIENER INDIV	0.0	0	0.0	0	0	1	0	160	0	0	0	0	0	0
*211 ROUND MOUNTAIN	0.0	1	0.0	0	0	1	1	760	0	0	0	1,240	0	0
212 RAHILLY-GRAVELLY	0.0	0	0.0	0	1	1	0	1,600	1,440	0	280	1,080	0	0
213 BURRO SPRING	0.0	0	0.0	0	0	0	0	0	520	0	0	480	0	0
215 HILL CAMP	0.0	0	0.0	0	0	1	1	800	0	0	0	1,280	0	0
*216 O'KEEFFE INDIV	0.0	0	2.0	0	0	1	1	0	640	0	0	3,120	0	0
218 SANDY SEEDING	0.0	0	0.0	0	0	0	2	0	0	0	0	0	0	0
222 FISHER LAKE	0.0	0	0.0	1	0	0	0	0	360	0	0	0	0	0
*400 PAISLEY COMMON	85.3	0	23.5	5	28	4	34	27,795	14,014	0	0	0	0	0
404 WILLOW CREEK	2.0	0	0.0	0	0	0	0	200	0	0	0	0	0	0
405 EAST CLOVER FLAT	2.0	0	0.0	0	0	3	1	160	0	0	0	0	0	0
407 CLOVER FLAT	0.0	0	0.0	0	1	1	0	0	0	0	0	0	0	0
409 TUCKER HILL	0.0	0	0.0	0	0	0	0	200	0	0	0	0	0	0
412 FIR TIMBER BUTTE	0.0	0	0.0	0	1	0	0	0	0	0	0	0	0	0
501 FLYNN	0.0	1	0.0	0	0	0	0	0	0	0	0	0	0	0
502 FITZGERALD	0.0	0	0.0	0	0	0	0	0	160	0	0	0	0	0
509 COX BUTTE	20.0	0	0.0	0	0	1	6	0	1,240	0	0	0	0	0
510 ORIJANA RIM	24.0	0	0.0	0	5	3	6	0	2,000	0	0	3,440	0	0
511 NORTHEAST WARNER	13.0	0	3.0	3	0	9	5	4,240	4,800	0	2,240	0	0	0
512 NORTH BLUEJOINT	3.8	0	0.0	0	0	0	3	0	1,280	0	0	0	0	0
514 CORN LAKE	13.0	0	0.0	0	0	7	5	1,760	680	1,240	4,800	0	0	0
515 JUNIPER MOUNTAIN	0.0	0	2.2	2	4	2	3	0	2,200	0	0	0	0	0
516 RABBIT BASIN	9.0	0	0.5	3	0	1	3	8,000	760	0	0	0	0	0
517 COYOTE-COLVIN	12.0	2	5.8	1	1	9	5	6,990	1,600	1,960	0	0	0	0
518 CLOVER CREEK	0.0	1	0.0	0	0	0	2	0	520	0	0	0	0	0
519 FISH CREEK	11.0	0	0.0	0	0	0	0	0	1,120	0	0	0	0	0
520 LYNCH-FLYNN	4.0	0	0.0	0	1	3	0	280	320	0	0	800	0	0
523 WARNER LAKES	12.0	0	0.0	0	0	0	0	2,880	0	0	0	0	0	0
*600 BEATYS BUTTE	72.3	2	20.0	0	7	52	18	16,960	22,480	1,760	26,000	11,520	0	0
*700 SILVER CR-BRIDGE CR	0.0	0	0.0	0	0	0	0	0	645	0	0	0	0	0
*701 UPPER BRIDGE CR	2.0	0	0.0	0	0	0	0	0	0	0	0	282	0	0
*702 BUCK CR-BRIDGE CR	1.5	0	0.0	0	0	0	0	0	414	0	0	0	0	0
*704 WARD LAKE	1.0	0	0.0	0	0	0	1	0	340	450	0	0	0	0
*705 OATMAN FLAT	0.0	0	1.0	0	0	0	0	0	757	0	0	0	0	0
706 RYE RANCH	0.0	0	1.0	0	0	0	1	0	0	0	0	0	0	0
707 TUFF BUTTE	5.0	0	0.0	0	0	0	0	0	0	0	0	0	0	0
708 ARROW GAP	0.0	0	0.0	0	0	0	0	0	45	0	0	0	0	0

Table B-3 Proposed Action Range Improvements (Cont.)

Allotment Number and Name	Fence (miles)	Springs	Pipe-line (miles)	Wells	Guzzlers	Reser-voirs	Water-holes	Seeding (acres) Spray	Seeding (acres) Burn	Seeding (acres) Chain	Brush Control (acres) Spray	Brush Control (acres) Burn	Brush Control (acres) Chain	Juniper Control (acres)
709 DEAD INDIAN-DUNCAN	4.0	1	0.0	0	1	1	0	0	0	0	0	0	0	0
*710 MURDOCK	6.0	0	1.0	0	0	1	0	0	330	0	0	0	0	0
711 SOUTH HAYES BUTTE	1.0	0	0.0	0	0	0	0	0	0	0	0	0	0	0
713 SILVER CREEK	0.0	0	0.0	0	0	1	0	0	0	0	0	0	0	0
801 HAUGHT	0.0	0	0.0	0	0	0	0	0	30	0	0	0	0	75
806 TWO MILE	0.0	0	0.0	0	0	0	0	0	0	30	0	0	0	0
810 BRENDA	0.0	0	0.0	0	0	2	0	0	0	0	0	0	0	0
*811 CHEYNE	0.0	0	0.0	0	0	0	0	0	0	45	0	0	0	0
815 STUKEL-DEHLINGER C.	1.0	0	0.0	0	0	0	0	0	0	0	0	0	0	0
819 DUPONT	0.2	0	0.0	0	0	0	0	0	0	0	0	0	0	0
*822 STUKEL-O'NEILL	0.0	0	0.0	0	0	0	0	0	0	0	0	0	0	60
826 HASKINS	0.0	0	0.0	0	0	1	0	0	0	0	0	0	0	0
829 HORTON	0.0	1	0.0	0	0	0	0	0	0	100	0	0	0	0
834 KELLISON	0.0	0	0.0	0	0	0	0	0	0	40	0	0	0	0
*838 WINDY RIDGE	0.0	0	0.0	0	0	0	0	0	120	0	0	0	0	0
841 MARSHALL	0.0	0	0.0	0	0	1	0	0	0	0	0	0	0	0
*848 POPE	0.0	0	0.0	0	0	0	0	0	0	0	0	150	0	0
852 RODGERS	0.8	0	0.0	0	0	1	0	0	0	20	0	0	0	0
855 BRYANT-SMITH	2.0	0	0.0	0	0	0	0	0	0	35	0	0	0	0
*858 VENABLE & BIAGGI	5.0	1	0.0	0	0	6	0	0	1,125	0	0	0	0	550
861 WILLIAMS	0.0	0	0.0	0	0	0	0	0	0	0	0	0	105	0
863 WIRTH	0.0	0	0.0	0	0	0	0	0	0	200	0	0	0	0
*877 BUMPHEADS	0.0	0	0.0	0	0	6	0	0	340	0	0	0	0	625
882 HORSEFLY	0.0	0	0.0	0	0	0	0	360	0	0	0	1,755	0	260
*883 HORTON	1.3	0	0.0	0	0	2	0	0	0	0	0	158	0	0
*884 LANE	0.0	2	0.0	0	0	1	0	0	0	0	0	70	0	0
885 DRY PRAIRIE	0.0	1	0.0	0	0	1	0	0	0	0	0	268	0	0
886 HORSE CAMP RIM	0.0	0	0.0	0	0	1	0	0	0	0	0	0	0	0
889 TIMBER HILL	0.0	0	0.0	0	0	0	2	0	0	30	0	0	0	0
*890 WILLOW VALLEY	0.0	0	0.0	0	0	0	3	0	900	0	0	0	0	0
*891 WILLOW VALLEY CHAIN.	0.0	0	0.0	0	0	0	2	0	0	410	0	0	0	300
*892 WILLIAMS	0.0	0	0.0	0	0	1	0	0	0	400	0	0	0	0
900 FREMONT	0.0	0	0.0	0	0	0	1	0	0	0	0	0	0	0
901 WASTINA	0.0	0	1.0	1	0	0	0	0	0	0	0	0	0	0
903 BEASLEY LAKE	0.0	0	0.0	1	0	0	1	0	0	0	0	0	0	0
905 HOMESTEAD	0.0	0	1.0	0	0	0	0	0	0	0	0	0	0	0
907 DEVILS GARDEN	2.0	0	0.0	0	0	0	0	0	0	0	0	0	0	0
908 COUGAR MOUNTAIN	0.0	0	1.0	0	0	0	0	0	0	0	0	0	0	0
909 BUTTON SPRINGS	2.0	0	0.0	0	0	0	0	0	0	0	0	0	0	0
914 WEST GREEN MOUNTAIN	7.0	0	0.0	0	0	0	0	0	0	0	0	0	0	0
1000 LITTLE JUNIPER SPR	10.5	0	4.2	4	2	14	5	0	1,000	0	0	0	0	0
1001 ALKALI WINTER	6.0	1	4.6	2	0	0	5	4,470	920	800	0	0	0	0
TOTALS	427.7	18	103.8	28	71	147	135	110,618	84,730	7,520	33,320	28,323	105	1,870

*Allotments which will have some shrubs and/or trees included in the seed mixture and/or spot seeded.

Table B-4 Anticipated Long-term Vegetation Allocation for the Proposed Action and Alternatives 1/

Allot. No.	Proposed Action				Alternative 1 No Action 2/		Alternative 3 Optimize Livestock				Alternative 4 Optimize Horses				Alternative 5 Optimize Other			
	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)
100	42	0	0	1,075	30	987	189	0	0	2,172	42	0	0	1,075	42	0	203	872
101	320	0	0	1,015	315	980	566	0	0	2,851	320	0	0	1,015	320	0	0	1,015
102	167	0	0	478	143	298	270	0	0	1,248	167	0	0	478	167	0	0	478
103	1,628	408	217	37,688	529	32,657	3,788	144	217	54,097	1,462	3,602	677	32,792	1,628	144	982	37,187
104	1	0	0	50	0	0	12	0	0	129	1	0	0	50	1	0	0	50
200	50	0	0	138	50	0	50	0	0	138	50	0	0	138	50	0	26	112
201	118	0	0	587	100	510	124	0	0	668	118	0	0	587	412	0	102	191
202	116	0	0	703	100	519	153	0	0	1,196	116	0	0	703	163	0	104	552
203	2	0	0	46	0	48	2	0	0	46	2	0	0	46	2	0	9	37
204	51	0	0	105	50	92	51	0	0	105	51	0	0	105	51	0	18	87
205	123	0	0	509	0	256	131	0	0	621	123	0	0	509	289	0	0	343
206	155	0	0	567	100	408	210	0	0	1,301	155	0	0	567	212	0	41	469
207	231	0	0	2,355	200	1,942	297	0	0	3,227	231	0	0	2,355	231	0	279	2,076
208	62	0	0	291	60	266	71	0	0	414	62	0	0	291	108	0	53	192
209	20	0	0	57	20	57	20	0	0	57	20	0	0	57	20	0	11	46
210	34	0	0	144	30	91	42	0	0	255	34	0	0	144	34	0	18	126
211	224	0	0	1,645	100	1,102	262	0	0	2,149	224	0	0	1,645	349	0	150	1,370
212	201	0	0	2,973	100	1,781	242	0	0	3,523	201	0	0	2,973	234	0	263	2,677
213	76	0	0	490	60	0	95	0	0	747	76	0	0	490	76	0	0	490
215	334	0	0	4,329	300	3,932	445	0	0	5,798	334	0	0	4,329	462	0	426	3,775
216	340	0	0	5,778	250	4,808	396	0	0	6,527	340	0	0	5,778	605	0	742	4,771
217	78	0	0	403	70	217	93	0	0	608	78	0	0	403	378	0	60	43
218	35	0	0	415	30	0	49	0	0	598	35	0	0	415	35	0	0	415
219	20	0	0	280	20	280	20	0	0	280	20	0	0	280	300	0	0	0
222	61	0	0	680	50	429	72	0	0	831	61	0	0	680	121	0	0	620
223	61	0	0	64	61	64	61	0	0	64	61	0	0	64	61	0	0	64
400	876	612	339	20,734	251	19,119	3,141	216	0	38,407	556	3,598	799	14,896	4,715	216	1,759	15,871
401	0	0	0	16	0	16	0	0	0	16	0	0	0	16	0	0	3	13
403	2	0	0	18	2	18	2	0	0	18	2	0	0	18	20	0	0	0
404	7	0	0	110	2	63	22	0	0	223	7	0	0	110	7	0	16	94
405	14	0	0	317	8	526	97	0	0	936	14	0	0	317	14	0	54	263
406	8	0	0	14	2	15	11	0	0	37	8	0	0	14	8	0	0	14
407	22	0	0	203	20	90	22	0	0	203	22	0	0	203	22	0	0	203
408	0	0	0	2	0	2	0	0	0	2	0	0	0	2	0	0	0	2
409	6	0	0	180	0	46	8	0	0	198	6	0	0	180	6	0	39	141
410	0	0	0	13	0	13	0	0	0	13	0	0	0	13	0	0	0	13
411	0	0	0	13	0	113	0	0	0	13	0	0	0	13	0	0	3	10
412	3	0	0	150	14	132	3	0	0	150	3	0	0	150	4	0	24	125
413	21	0	0	67	8	67	23	0	0	80	21	0	0	67	24	0	11	53
415	7	0	0	42	7	42	14	0	0	98	7	0	0	42	7	0	10	32
416	1	0	0	10	1	10	1	0	0	10	1	0	0	10	1	0	2	8
417	0	0	0	9	0	5	0	0	0	9	0	0	0	9	0	0	2	7
501	55	0	0	120	55	120	55	0	0	120	55	0	0	120	55	0	24	96
502	63	0	0	386	60	346	63	0	0	386	63	0	0	386	63	0	69	317
503	60	0	0	247	60	295	60	0	0	247	60	0	0	247	60	0	0	247
504	0	0	0	23	0	23	0	0	0	23	0	0	0	23	0	0	0	23
505	0	0	0	20	0	20	0	0	0	20	0	0	0	20	0	0	4	16
506	0	0	0	10	0	10	0	0	0	10	0	0	0	10	0	0	2	8

Table B-4 Anticipated Long-term Vegetation Allocation for the Proposed Action and Alternatives (Cont.)

Allot. No.	Proposed Action				Alternative 1 No Action 2/		Alternative 3 Optimize Livestock				Alternative 4 Optimize Horses				Alternative 5 Optimize Other			
	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)
507	50	0	0	164	50	164	50	0	0	164	50	0	0	164	150	0	0	64
508	0	0	0	9	0	9	0	0	0	9	0	0	0	9	0	0	2	7
509	106	0	0	1,770	0	1,196	106	0	0	1,770	106	0	0	1,770	106	0	157	1,613
510	194	0	0	2,673	0	1,423	433	0	0	5,847	194	0	0	2,673	527	0	197	2,143
511	285	0	0	9,587	0	5,956	884	0	0	17,551	285	0	0	9,587	315	0	864	8,693
512	156	0	0	1,038	0	289	192	0	0	1,515	156	0	0	1,038	186	0	58	950
514	194	0	0	4,714	0	2,663	518	0	0	9,024	194	0	0	4,714	194	0	0	4,714
515	221	0	0	5,009	0	3,621	642	0	0	10,602	221	0	0	5,009	221	0	0	5,009
516	240	0	0	3,408	0	570	877	0	0	11,876	240	0	0	3,408	240	0	0	3,408
517	369	0	0	8,783	0	5,209	954	0	0	16,558	369	0	0	8,783	679	0	0	8,473
518	42	0	0	889	0	435	57	0	0	1,087	42	0	0	889	86	0	57	788
519	77	0	0	1,060	0	498	121	0	0	1,648	77	0	0	1,060	102	0	74	961
520	71	0	0	1,124	55	867	151	0	0	2,182	71	0	0	1,124	71	0	182	942
521	139	0	0	75	0	30	139	0	0	75	139	0	0	75	139	0	13	62
522	69	0	0	2,617	60	2,501	69	0	0	2,617	69	0	0	2,617	69	0	0	2,617
523	148	0	0	2,965	0	1,489	148	0	0	2,965	148	0	0	2,965	1,748	0	331	1,034
524	50	0	0	65	50	65	50	0	0	65	50	0	0	65	50	0	13	52
600	1,762	2,400	0	43,627	0	27,892	3,789	360	0	72,590	892	18,000	6,235	10,227	2,389	360	4,534	40,506
700	85	0	0	385	69	262	167	0	0	995	85	0	0	385	89	0	33	348
701	35	0	0	151	29	108	40	0	0	189	35	0	0	151	35	0	21	130
702	146	0	12	350	142	309	174	0	0	570	146	0	12	350	150	0	12	346
703	36	0	0	107	36	107	36	0	0	107	36	0	0	107	36	0	25	82
704	220	0	0	900	187	650	261	0	0	1,203	220	0	0	900	220	0	199	701
705	646	0	0	1,778	463	1,332	692	0	0	2,118	646	0	0	1,778	646	0	111	1,667
706	136	0	0	587	130	539	188	0	0	979	136	0	0	587	136	0	134	453
707	341	0	0	546	340	376	374	0	0	794	341	0	0	546	341	0	111	435
708	6	0	0	178	0	135	38	0	0	420	6	0	0	178	6	0	27	151
709	647	0	0	586	435	586	707	0	0	1,034	647	0	0	586	807	0	250	176
710	84	0	0	643	72	705	99	0	0	756	84	0	0	643	84	0	56	587
711	17	0	0	86	16	72	23	0	0	134	17	0	0	86	17	0	19	67
712	50	0	0	99	99	50	50	0	0	99	50	0	0	99	50	0	0	99
713	62	0	0	220	62	200	87	0	0	403	62	0	0	220	62	0	0	220
714	173	0	0	0	173	250	173	0	0	0	173	0	0	0	173	0	0	0
715	193	0	0	908	295	750	198	0	0	949	193	0	0	908	193	0	110	798
716	0	0	0	250	0	0	0	0	0	250	0	0	0	0	0	0	50	200
800	4	0	0	6	0	6	4	0	0	6	4	0	0	6	9	0	1	0
801	5	0	0	35	0	27	7	0	0	46	5	0	0	35	5	0	0	35
804	6	0	0	42	0	42	6	0	0	42	6	0	0	42	9	0	0	39
806	12	0	0	83	0	80	13	0	0	91	12	0	0	83	12	0	0	83
807	15	0	0	100	0	100	28	0	0	169	15	0	0	100	115	0	0	0
808	1	0	0	10	0	10	1	0	0	10	1	0	0	10	11	0	0	0
809	4	0	0	30	0	30	4	0	0	30	4	0	0	30	34	0	0	0
810	18	0	0	124	0	124	18	0	0	124	18	0	0	124	18	0	0	124
811	6	0	0	60	0	51	10	0	0	81	6	0	0	60	6	0	0	60
812	7	0	0	55	0	55	7	0	0	55	7	0	0	55	7	0	0	55
813	3	0	0	20	0	20	3	0	0	20	3	0	0	20	3	0	0	20
814	16	0	0	108	0	108	16	0	0	108	16	0	0	108	16	0	0	108
815	29	0	0	240	0	240	29	0	0	240	29	0	0	240	29	0	0	240

Table B-4 Anticipated Long-term Vegetation Allocation for the Proposed Action and Alternatives (Cont.)

Allot. No.	Proposed Action				Alternative 1 No Action 2/		Alternative 3 Optimize Livestock				Alternative 4 Optimize Horses				Alternative 5 Optimize Other			
	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)
816	4	0	0	30	0	30	4	0	0	30	4	0	0	30	4	0	0	30
817	16	0	0	108	0	108	16	0	0	108	16	0	0	108	16	0	0	108
818	2	0	0	15	0	15	2	0	0	15	2	0	0	15	2	0	0	15
819	1	0	0	7	0	7	1	0	0	7	1	0	0	7	1	0	0	7
820	2	0	0	16	0	16	2	0	0	16	2	0	0	16	2	0	0	16
821	27	0	0	68	0	68	27	0	0	68	27	0	0	68	27	0	0	68
822	26	0	0	212	0	209	27	0	0	215	26	0	0	212	26	0	0	212
823	23	0	0	60	0	60	23	0	0	60	23	0	0	60	23	0	0	60
825	12	0	0	76	0	76	12	0	0	76	12	0	0	76	12	0	0	76
826	6	0	0	80	0	80	6	0	0	80	6	0	0	80	14	0	0	72
827	3	0	0	25	0	25	3	0	0	25	3	0	0	25	3	0	0	25
828	7	0	0	60	0	60	7	0	0	60	7	0	0	60	7	0	0	60
829	7	0	0	41	0	26	11	0	0	60	7	0	0	41	48	0	0	0
830	3	0	0	40	0	40	3	0	0	40	3	0	0	40	3	0	0	40
831	8	0	0	54	0	50	8	0	0	54	8	0	0	54	9	0	0	53
832	23	0	0	158	0	158	24	0	0	163	23	0	0	158	23	0	0	158
833	1	0	0	7	0	6	1	0	0	7	1	0	0	7	1	0	0	7
834	2	0	0	24	0	19	3	0	0	31	2	0	0	24	2	0	0	24
835	3	0	0	20	0	20	3	0	0	20	3	0	0	20	21	0	0	2
836	16	0	0	104	0	96	16	0	0	104	16	0	0	104	120	0	0	0
837	20	0	0	140	0	130	20	0	0	140	20	0	0	140	22	0	0	138
838	12	0	0	68	0	52	19	0	0	102	12	0	0	68	64	0	0	16
839	77	0	0	519	0	490	77	0	0	519	77	0	0	519	77	0	0	519
840	5	0	0	38	0	38	5	0	0	38	5	0	0	38	5	0	0	38
841	2	0	0	14	0	14	2	0	0	14	2	0	0	14	16	0	0	0
842	3	0	0	40	0	40	3	0	0	40	3	0	0	40	9	0	0	34
845	3	0	0	55	0	55	3	0	0	55	3	0	0	55	3	0	0	55
846	9	0	0	140	0	140	9	0	0	140	9	0	0	140	9	0	0	140
847	43	0	0	108	0	108	43	0	0	108	43	0	0	108	43	0	0	108
848	9	0	0	78	0	70	11	0	0	86	9	0	0	78	9	0	0	78
849	4	0	0	32	0	32	4	0	0	32	4	0	0	32	4	0	0	32
851	18	0	0	118	0	110	18	0	0	118	18	0	0	118	32	0	0	104
852	31	0	0	251	0	249	31	0	0	251	31	0	0	251	31	0	0	251
853	41	0	0	104	0	104	41	0	0	104	41	0	0	104	41	0	0	104
855	18	0	0	122	0	109	19	0	0	127	18	0	0	122	21	0	0	118
856	11	0	0	73	0	70	11	0	0	73	11	0	0	73	12	0	0	72
857	7	0	0	49	0	42	7	0	0	49	7	0	0	49	8	0	0	48
858	88	0	0	530	0	300	142	0	0	813	88	0	0	530	322	0	0	296
859	7	0	0	62	0	60	7	0	0	62	7	0	0	62	7	0	0	62
860	6	0	0	86	0	83	9	0	0	103	6	0	0	86	6	0	0	86
861	12	0	0	134	0	120	13	0	0	137	12	0	0	134	15	0	0	121
862	8	0	0	96	0	85	8	0	0	96	8	0	0	96	8	0	0	96
863	22	0	0	132	0	113	29	0	0	167	22	0	0	132	22	0	0	132
864	16	0	0	110	0	110	16	0	0	110	16	0	0	110	16	0	0	110
876	126	0	0	515	0	475	126	0	0	515	126	0	0	515	150	0	22	469
877	151	0	0	869	0	764	190	0	0	1,076	151	0	0	869	303	0	160	557
878	0	0	0	47	0	47	0	0	0	47	0	0	0	47	0	0	9	38
879	2	0	0	12	0	12	2	0	0	12	2	0	0	12	2	0	3	9

Table B-4 Anticipated Long-term Vegetation Allocation for the Proposed Action and Alternatives (Cont.)

Allot. No.	Proposed Action				Alternative 1 No Action 2/		Alternative 3 Optimize Livestock				Alternative 4 Optimize Horses				Alternative 5 Optimize Other			
	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)	Wild-life (AUMs)	Wild Horses (AUMs)	Noncon-sumptive (AUMs)	Live-stock (AUMs)
881	1	0	0	32	0	32	1	0	0	32	1	0	0	32	1	0	6	26
882	585	0	0	2,664	0	2,458	588	0	0	2,681	585	0	0	2,664	758	0	426	2,065
883	2	0	0	69	0	58	5	0	0	83	2	0	0	69	66	0	1	4
884	2	0	0	50	0	43	2	0	0	50	2	0	0	50	16	0	6	30
885	142	0	0	667	0	606	160	0	0	719	142	0	0	667	167	0	130	512
886	55	0	0	322	0	300	55	0	0	322	55	0	0	322	57	0	71	249
887	97	0	0	473	0	434	97	0	0	473	97	0	0	473	200	0	31	339
888	50	0	0	240	0	216	50	0	0	240	50	0	0	240	78	0	6	206
889	61	0	0	302	0	270	61	0	0	302	61	0	0	302	65	0	18	280
890	261	0	0	1,486	0	1,270	308	0	0	1,732	261	0	0	1,486	327	0	280	1,140
891	85	0	0	207	0	105	104	0	0	308	85	0	0	207	255	0	0	37
892	10	0	0	129	0	75	18	0	0	174	10	0	0	129	14	0	14	111
893	1	0	0	6	0	6	1	0	0	6	1	0	0	6	1	0	1	5
895	17	0	0	117	0	108	17	0	0	117	17	0	0	117	17	0	0	117
896	13	0	0	96	0	88	13	0	0	96	13	0	0	96	17	0	0	92
900	1,246	0	0	2,107	806	1,970	1,398	0	0	3,239	1,246	0	0	2,107	1,246	0	5	2,102
901	311	0	0	419	311	419	325	0	0	524	311	0	0	419	311	0	39	380
902	634	0	0	923	634	923	738	0	0	1,704	634	0	0	923	634	0	0	923
903	66	0	0	232	66	232	93	0	0	437	66	0	0	232	66	0	0	232
904	91	0	0	244	91	244	166	0	0	803	91	0	0	244	91	0	0	244
905	520	0	0	892	508	805	590	0	0	1,413	520	0	0	892	520	0	0	892
906	51	0	0	112	51	112	51	0	0	112	51	0	0	112	51	0	0	112
907	116	0	0	287	116	0	121	0	0	282	116	0	0	287	116	0	0	287
908	534	0	0	616	534	616	619	0	0	1,253	534	0	0	616	534	0	76	540
909	252	0	0	1,068	252	1,068	252	0	0	1,068	252	0	0	1,068	252	0	212	856
910	182	0	0	680	182	680	182	0	0	680	182	0	0	680	182	0	0	680
911	155	0	0	782	137	669	169	0	0	884	155	0	0	782	155	0	161	621
912	2	0	0	15	1	16	2	0	0	15	2	0	0	15	2	0	2	13
913	0	0	0	24	0	12	6	0	0	66	0	0	0	24	0	0	0	24
914	201	0	0	1,309	191	1,233	214	0	0	1,405	201	0	0	1,309	201	0	21	1,288
915	535	0	0	1,000	535	1,000	535	0	0	1,000	535	0	0	1,000	535	0	128	872
916	0	0	0	10	0	16	0	0	0	10	0	0	0	10	0	0	2	8
1000	764	0	0	9,185	480	5,418	1,066	0	0	13,201	764	0	0	9,185	764	0	0	9,185
1001	140	0	0	6,284	0	4,418	215	0	0	7,283	140	0	0	6,284	140	0	0	6,284
1002	0	0	0	159	0	159	0	0	0	159	0	0	0	159	0	0	0	159
1300	5	0	0	10	0	10	5	0	0	10	5	0	0	10	5	0	0	10
1301	5	0	0	10	0	10	5	0	0	10	5	0	0	10	5	0	0	10
1302	14	0	0	30	0	30	14	0	0	30	14	0	0	30	14	0	0	30
1303	10	0	0	20	0	20	10	0	0	20	10	0	0	20	10	0	0	20
1305	14	0	0	29	0	29	14	0	0	29	14	0	0	29	14	0	0	29
1306	27	0	0	57	0	55	27	0	0	57	27	0	0	57	27	0	0	57
1307	5	0	10	0	0	10	5	0	10	0	5	0	10	0	5	0	10	0
1308	0	0	0	4	0	4	0	0	0	4	0	0	0	4	0	0	0	4
EIS Total	21,076	3,420	578	222,948	10,916	166,454	33,232	720	227	350,442	19,720	25,200	7,733	178,564	31,488	720	14,990	200,813

1/ The vegetation allocation for Alternative 2, Eliminate Livestock Grazing, would be zero for livestock and the same as the short term proposed action for wildlife and wild horses. All remaining forage would be available for nonconsumptive uses.
2/ Long-term vegetation allocation for Alternatives 1 and 2 has not been projected; therefore, the short-term allocation is shown.

Table B-5 Additional Range Improvements for Alternative 3 Above the Proposed Action 1/

Allotment Number and Name	Fence (miles)	Springs	Pipe-line (miles)	Wells	Reser-voirs	Water-holes	Seeding (acres) Spray	Seeding (acres) Burn	Seeding (acres) Chain	Brush Control (acres) Spray	Brush Control (acres) Burn	Brush Control (acres) Chain	Juniper Control (acres)
100 PETER CREEK	0	0	0	0	0	0	0	2,700	0	0	11,000	0	0
101 EAST GREEN MOUNTAIN	0	0	0	1	0	0	0	5,700	6,000	0	5,541	0	0
102 CRACK IN THE GROUND	0	0	0	0	0	0	0	1,200	680	0	5,100	0	0
103 VIEWPOINT	0	0	0	1	0	5	29,347	10,000	0	77,700	30,000	0	0
104 BOTTOMLESS LAKE	0	0	0	0	0	0	0	565	0	0	0	0	0
200 BLUE CREEK	0	1	0	0	1	0	0	0	0	0	0	0	0
201 VINYARD INDIV	0	1	0	0	0	0	0	0	0	1,480	0	0	0
202 HICKEY INDIV	0	0	0	0	2	0	0	0	0	9,000	0	0	0
205 GREASER DRIFT	0	0	1	0	0	0	0	400	0	0	0	0	0
206 LANE PLAN II	0	0	0	0	2	0	0	0	0	9,000	0	0	0
207 LANE PLAN I	0	0	0	0	6	0	0	2,500	0	6,400	0	0	0
208 SAGEHEN	0	0	0	0	1	0	0	0	0	2,000	0	0	0
210 GRIENER INDIV	0	0	0	0	0	0	250	0	0	400	0	0	0
211 ROUND MOUNTAIN	0	1	0	0	2	0	1,200	0	0	4,920	0	0	0
212 RAHILLY-GRAVELLY	0	1	0	0	4	0	0	1,220	0	3,400	0	0	0
213 BURRO SPRING	0	0	0	1	0	0	0	600	0	0	1,000	0	0
215 HILL CAMP	0	0	0	0	1	0	0	1,680	0	14,000	0	0	0
216 O'KEEFFE INDIV	0	0	2	1	8	0	0	600	0	4,000	4,000	0	0
217 COX INDIV	0	0	0	0	2	0	0	500	0	940	940	0	0
218 SANDY SEEDING	0	0	0	0	0	0	800	0	0	0	0	0	0
222 FISHER LAKE	0	0	0	0	1	0	0	600	0	0	0	0	0
400 PAISLEY COMMON	0	0	0	1	0	4	52,901	0	0	88,985	0	0	0
404 WILLOW CREEK	0	0	0	0	0	0	0	0	0	1,060	0	0	0
405 EAST CLOVER FLAT	0	0	0	0	0	0	0	0	0	6,600	0	0	0
406 WEST CLOVER FLAT	0	0	0	0	0	0	110	0	0	0	0	0	0
409 TUCKER HILL	0	0	0	0	0	0	100	0	0	0	0	0	0
412 FIR TIMBER BUTTE	0	0	0	0	0	0	0	0	0	600	0	0	0
415 BRIGGS GARDEN	0	0	0	0	0	0	0	0	0	785	0	0	0
509 COX BUTTE	0	0	0	0	2	0	0	0	0	0	0	0	0
510 ORIJANA RIM	0	0	0	0	4	0	0	0	0	51,820	0	0	0
511 NORTHEAST WARNER	0	1	3	0	6	0	15,000	0	0	116,000	0	0	0
512 NORTH BLUEJOINT	0	0	2	2	0	0	0	2,400	0	0	0	0	0
514 CORN LAKE	0	0	0	1	0	0	5,000	5,000	0	46,000	0	0	0
515 JUNIPER MOUNTAIN	0	0	2	0	4	0	13,500	0	0	74,720	0	0	0
516 RABBIT BASIN	0	0	4	2	2	0	36,000	0	0	7,040	0	0	0
517 COYOTE-COLVIN	0	1	0	0	6	0	15,209	5,000	0	76,000	0	0	0
518 CLOVER CREEK	0	0	0	0	2	0	0	0	0	9,000	0	0	0
519 FISH CREEK	0	0	0	0	3	0	750	750	0	3,500	3,500	0	0
520 LYNCH-FLYNN	0	0	0	0	2	0	3,800	0	0	5,500	6,000	0	0
523 WARNER LAKES	0	0	0	0	8	0	0	0	0	0	0	0	0
600 BEATYS BUTTE	0	8	12	2	29	0	32,000	32,000	0	80,000	80,000	0	0
700 SILVER CR-BRIDGE CR	0	0	0	0	0	0	0	2,895	0	0	1,200	0	0
701 UPPER BRIDGE CR	0	0	0	0	0	0	0	0	0	640	0	0	0
702 BUCK CR-BRIDGE CR	0	0	0	0	0	0	0	1,186	0	0	0	0	0
704 WARD LAKE	0	0	0	0	0	0	0	0	3,100	0	0	0	0
705 OATMAN FLAT	0	0	0	0	0	0	493	0	1,600	0	1,600	0	0
706 RYE RANCH	0	0	0	0	0	0	0	2,840	0	1,400	0	0	0
707 TUFF BUTTE	0	0	0	0	0	0	0	0	800	2,400	0	0	0
708 ARROW GAP	2	0	0	0	0	0	1,335	0	0	0	0	0	0

Table B-5 Additional Range Improvements for Alternative 3 Above the Proposed Action [1/] (Cont.)

Allotment Number and Name	Fence (miles)	Springs	Pipe-line (miles)	Wells	Reser-voirs	Water-holes	Seeding (acres) Spray	Seeding (acres) Burn	Seeding (acres) Chain	Brush Control (acres) Spray	Brush Control (acres) Burn	Brush Control (acres) Chain	Juniper Control (acres)
709 DEAD INDIAN-DUNCAN	0	0	0	0	0	0	0	0	600	4,580	0	0	0
710 MURDOCK	0	0	0	0	0	0	0	650	0	0	0	0	0
711 SOUTH HAYES BUTTE	0	0	0	0	0	0	0	0	600	0	0	0	0
713 SILVER CREEK	0	0	0	0	0	0	0	800	0	660	0	0	0
715 CONNELLY HILLS	0	0	0	0	0	0	0	0	0	0	2,120	0	0
801 HAUGHT	0	0	0	0	0	0	0	0	0	0	0	0	75
806 TWO MILE	0	0	0	0	0	0	0	90	0	0	0	0	0
807 BARNWELL	0	0	0	0	0	0	1,240	0	0	0	0	0	0
811 CHEYNE	0	0	0	0	0	0	0	0	395	0	0	0	0
822 STUKEL-O'NEILL	0	0	0	0	0	0	0	0	0	0	0	0	70
829 HORTON	0	0	0	0	0	0	0	0	110	0	0	0	0
832 JESPERSON	0	0	0	0	0	0	60	0	0	0	0	0	0
834 KELLISON	0	0	0	0	0	0	0	0	60	0	0	0	0
838 WINDY RIDGE	0	0	0	0	0	0	0	360	0	0	0	0	0
848 POPE	0	0	0	0	0	0	0	180	0	0	0	0	0
855 BRYANT-SMITH	0	0	0	0	0	0	0	0	35	0	0	0	0
858 VENABLE & BIAGGI	0	0	0	0	0	0	400	1,495	0	0	0	0	180
861 WILLIAMS	0	0	0	0	0	0	0	0	0	0	0	105	0
863 WIRTH	0	0	0	0	0	0	0	0	360	0	0	0	0
877 BUMPHEADS	0	0	0	0	0	0	0	3,060	0	0	0	0	1,375
882 HORSEFLY	0	0	0	0	0	0	0	0	0	0	525	0	170
883 HORTON	0	0	0	0	0	0	0	232	0	0	0	0	0
885 DRY PRAIRIE	0	0	0	0	0	0	0	490	0	0	310	0	0
889 TIMBER HILL	0	0	0	0	0	0	0	0	70	0	0	0	0
890 WILLOW VALLEY	0	0	0	0	0	0	0	2,250	0	0	0	0	0
891 WILLOW VALLEY CHAIN.	0	0	0	0	0	0	0	0	0	0	0	0	1,200
892 WILLIAMS	0	0	0	0	0	0	0	0	400	0	0	0	0
900 FREMONT	0	0	0	0	0	1	6,900	0	0	1,950	0	0	0
901 WASTINA	0	0	0	0	0	0	0	0	0	0	1,760	0	0
902 CINDER BUTTE	0	0	0	0	0	0	5,100	0	0	0	0	0	0
903 BEASLEY LAKE	0	0	0	0	0	0	2,120	0	0	0	0	0	0
904 HIGHWAY	0	0	0	0	0	0	3,240	0	0	0	0	0	0
905 HOMESTEAD	0	0	0	0	0	0	2,240	0	0	5,760	0	0	0
908 COUGAR MOUNTAIN	0	0	0	0	0	0	4,000	0	0	0	0	0	0
911 VALLEY	0	0	0	0	0	0	700	0	0	0	0	0	0
913 INDIVIDUAL	0	0	0	0	0	0	240	0	0	0	0	0	0
914 WEST GREEN MOUNTAIN	0	0	0	0	0	0	0	0	4,160	0	0	0	0
1000 LITTLE JUNIPER SPR	0	0	0	1	4	0	0	18,500	0	27,000	27,000	0	0
1001 ALKALI WINTER	0	0	0	1	0	0	0	1,500	0	0	17,000	0	0
TOTALS	2	14	26	14	102	10	234,035	109,943	18,970	745,240	198,596	105	3,070

1/ See Table B-3 for proposed action range improvements.

Appendix C

Determination of Forage Production and Vegetation Allocation

Determination of Present Forage Production

Forage production for most of the allotments within the EIS area was originally determined using the Weight Estimate Method (BLM Manual 4412. 11B) between the years 1957-1963. Using these data as a basis, the grazing capacity has been periodically adjusted to reflect changes in forage production caused by fire, land treatments, allotment boundary adjustments, land exchanges, the construction of exclosures, new water developments and drift fences. A comparison of the range conditions as measured by the 1978 Deming Two-Phase Method range condition survey with known levels of actual grazing use further refined the forage production determination.

An example of how the production was determined is shown by the Beatys Butte Allotment (#600). The original survey and subsequent studies of Beatys Butte measured 27,892 AUMs available forage production. During the period 1969-1978 the combined average annual grazing use by livestock and wild horses totaled 28,965 AUMs. The 1978 survey indicated that most of the allotment was in fair condition with an upward trend. Therefore, the 28,965 AUM level was determined to be the best estimate of sustainable forage production for the allotment.

Forage production of small allotments on scattered land parcels (primarily in the Lost River Resource Area) was determined by comparing surveyed production levels of nearby larger allotments with known levels of grazing use and estimated condition.

Determination of Proposed Initial Vegetation Allocation

The existing forage production is proposed for allocation among livestock, wildlife, wild horses and nonconsumptive uses. The allocation to the nonconsumptive category results in AUMs of forage production remaining unused.

Wild horse forage requirements are based on wild horse population objectives set forth in the Wild Horse Herd Management Plans (HMPs). For the Beatys Butte herd, the management plan shows a population objective of 200 wild horses requiring 2,400 AUMs of forage annually. Wild horses and livestock have a 100 percent dietary overlap in this area; therefore, all 2,400 AUMs of forage are competitive.

Wildlife forage needs were determined by prorating the number of big game animals in each herd area to each allotment and then calculating the total number of AUMs needed within each allotment to support these animals.

Oregon Department of Fish & Wildlife (ODFW) supplied big game numbers and season of use. Only competitive AUMs were formally allocated to big game. A competitive AUM is forage composed of palatable shrubs, grasses and forbs eaten by both livestock and wildlife. The portion of total big game forage which is competitive is based on the dietary overlap or percent competitiveness for deer.

Big game unit months were converted to AUMs using the following conversion ratios:

5.3	Deer Unit Months	= 1 AUM
7	Antelope Unit Months	= 1 AUM

Big game was allocated forage in proportion to the percent of public land in the allotment. A mathematical equation illustrates the method used to derive wildlife AUMs.

$$\text{Deer Nos.} \times \text{Months of Use} \times \frac{1\ \text{AUM}}{5.3} \times \%\ \text{BLM} \times \%\ \text{Dietary Overlap} = \text{Wildlife AUM Allocation}$$

The same formula with the 7:1 AUM conversion factors was used for antelope.

In the Beatys Butte Allotment, approximately 444 competitive AUMs of forage are required for wildlife to maintain the current population of mule deer and antelope.

A summary of the proposed vegetation allocation within the Beatys Butte allotment is shown below:

Present Forage Production	28,965 AUMs
Allocated to horses	2,400 AUMs
Allocated to wildlife	444 AUMs
Allocated to livestock	26,121 AUMs
Total Allocation	28,965 AUMs

Determination of Future Forage Production

The analysis of predicted changes in grazing capacity is based on the expected change in key species composition and vegetative production. These changes would occur as a result of changes in livestock distribution provided by water developments, timing and intensity of livestock grazing, and the conversion of shrub plant communities to perennial bunchgrass plant communities.

In the Beatys Butte Allotment, the implementation of rest rotation grazing on 481,893 acres and the construction of 39 water developments would result in improved livestock distribution. Key species composition and production would increase, accounting for an estimated increase of 5,793 AUMs. Vegetative manipulation on 78,720 acres would result in an additional 13,031 AUMs of forage production. Ten years following implementation, the forage production of the allotment is thus expected to increase by 18,824 AUMs. Added to the current production of 28,965 AUMs, the future forage production of the allotment would be approximately 47,789 AUMs.

Determination of Anticipated Long-Term Vegetation Allocation

The determination of the long-term allocation uses the same methodology as the short-term allocation; however, long range wildlife population and livestock production objectives are considered in the allocation. In the Beatys Butte allotment, the allocation of vegetation to wild horses would remain at 2,400 AUMs since this number fulfills the requirements of the population objectives described in the Herd Management Plan. In addition to the existing allocation of 444 AUMs, 1,318 AUMs would be allocated to wildlife to allow mule deer and antelope herd sizes to increase in line with ODFW's objectives. The remaining 43,627 AUMs would be allocated to livestock. The long-term allocation is for analysis purposes only. The actual allocation will be made only as forage becomes available and in line with multiple use resource objectives of future resource management plans.

Appendix D

Scientific Names of Plants Mentioned in the EIS

alder	*Alnus ssp.*
aster	*Aster ssp.*
basin wildrye	*Elymus cinereus*
big sagebrush	*Artemisia tridentata*
bitterbrush	*Purshia tridentata*
bluebunch wheatgrass	*Agropyron spicatum*
buckwheat	*Eriogonum spp.*
bulrush	*Scirpus spp.*
ceanothus	*Ceanothus spp.*
cheatgrass	*Bromus tectorum*
chokecherry	*Prunus virginiana*
creek dogwood	*Cornus stolonifera*
creeping wildrye	*Elymus triticoides*
crested wheatgrass	*Agropyron cristatum*
currant	*Ribes spp.*
dock	*Rumex spp.*
greasewood	*Sarcobatus vermiculatus*
hopsage	*Atriplex spinosa*
Idaho fescue	*Festuca idahoensis*
junegrass	*Koeleria cristata*
juniper	*Juniperus occidentalis*
Kentucky bluegrass	*Poa pratensis*
knotweed	*Polygonum spp.*
low sagebrush	*Artemisia arbuscula*
manzanita	*Manzanita spp.*
mat muhly	*Muhlenbergia richardsonis*
mountain mahogany	*Cercocarpus ledifolius*
needlegrass	*Stipa spp.*
phlox	*Phlox spp.*
ponderosa pine	*Pinus ponderosa*
pondweed	*Potamogeton spp.*
poverty weed	*Iva axillaris*
quaking aspen	*Populus tremuloides*
rabbitbrush	*Chrysothamnus spp.*
rush	*Juncus spp.*
saltgrass	*Distichlis spp.*
Sandberg bluegrass	*Poa sandbergii*
sedge	*Carex spp.*
shadscale	*Atriplex confertifolia*
silver sagebrush	*Artemisia cana*
spiney hopsage	*Grayia spinosa*
squirreltail	*Sitanion hystrix*
smartweed	*Polygonum spp.*
Thurber's needlegrass	*Stipa thurberiana*
timothy	*Phleum pratense*
willow	*Salix spp.*
yarrow	*Achillea millefolium*

Appendix E

Determination of Existing and Predicted Range Condition and Trend

Determination of Existing Range Condition and Trend

Range condition was determined by the Deming Two-Phase method. This was the standard method for determining range condition on public lands in the 1950's and 60's. The Lakeview District was originally surveyed using the Two-Phase method between 1956 and 1964. This method is no longer in the current BLM manuals. For this reason, a brief description of the method is provided below. A copy of the former manual is available for review at the Lakeview District Office.

According to the former manual, the Two-Phase method "... is used to judge the relative condition of both the Forage Stand and the Site-Soil Mantle phases of lands used primarily for grazing purposes. It serves to determine trends in range condition over long periods of time ... by means of successive periodic resurveys." Since the original transect sheets and other information were available, the Two-Phase method was used again in 1978 and 1979 on the Lakeview District. The difference between the two surveys was used to determine range trend. However, since 1978 was above average in precipitation, the survey results showed more of an upward trend than if the survey had occurred in a normal year.

The Two-Phase method is based on consideration of the productive capabilities of the land under proper grazing use rather than on the basis of a purely ecological or vegetational climax. Observations are made in the field at random. The plants observed are classified primarily by the relative value of each plant species for forage production purposes, but consideration is also given to its relative efficiency as protective cover for the soil mantle and to its position in the developmental stages of plant succession. For each observation, the vegetal type is designated and the site described as to land form, topography, exposure, soil characteristics and moisture characteristics. Numerical ratings are assigned for each of the above items. The sum of the total rating obtained determines the range condition class for each writeup and location. Five condition classes are described: Excellent, Good, Fair, Poor and Bad. Very few acres were classified as Excellent or Bad, so those acres were grouped respectively into Good and Poor.

Determination of Predicted Range Condition

The determinations of predicted range conditions are based on the discussion of vegetation allocation and grazing systems in Chapter 3. Variables such as large year-to-year fluctuations in precipitation make a precise quantification of impacts to vegetation impossible. The impact analysis methodology, therefore, produces a result which is most useful as a relative comparison between alternatives rather than as an absolute prediction of the impacts of implementing any one alternative.

The following analysis of impacts to range condition on the Fish Creek Allotment (519) illustrates how the components of the proposed action and alternatives resulted in the long-term range conditions shown in Table 3-1. The Fish Creek Allotment is currently managed under a spring/summer grazing system and includes a 130 acre exclosure. The 1978 range condition inventory indicated that 1,127 acres are in good and 13,678 acres are in fair condition. No areas are currently in poor condition.

The following actions are proposed for the allotment:

1. Implementation of rest rotation grazing on 14,665 acres.

2. Prescribed burning of 1,120 acres followed by seeding.

3. The construction of a 10-acre exclosure in addition to the existing exclosure.

4. An increase of 125 AUMs of livestock use over the current level (498 AUMs) of active preference.

5. A delay in the livestock turnout date from April 16 to May 1.

The proposed vegetative treatment would result in good range condition on 1,120 acres by converting a sagebrush-dominated plant community to a grass-dominated community. The increase in livestock use would occur after successful completion of the project. The delay in the livestock turnout date and the implementation of rest rotation grazing would improve the vigor of the native key species on the remainder of the allotment. Improved vigor is reflected in increases in seed production. The rest periods provided under the proposed grazing systems would aid in seedling establishment. Improvement in riparian vegetation would occur following construction of the 10-acre exclosure along Fish Creek. At the end of 20 years, the entire 14,805 acres in the allotment would be in good condition.

Appendix F

Existing Range Condition and Trend by Allotment

Allotment	Condition				Trend			
	Good (Acres)	Fair (Acres)	Poor (Acres)	Unsurveyed (Acres)	Upward (Acres)	Static (Acres)	Downward (Acres)	No Trend (Acres)
100	4,836	8,964	0	0	1,600	12,200	0	0
101	16,241	1,000	0	0	13,807	3,434	0	0
102	4,718	10,701	0	0	11,823	3,596	0	0
103	128,545	316,442	61,549	17,644	228,460	239,771	38,305	17,644
104	0	0	0	565	0	0	0	565
200	600	0	0	0	0	600	0	0
201	2,560	5,507	320	213	2,560	6,040	0	0
202	10,906	0	0	0	3,840	7,066	0	0
203	192	373	0	0	0	565	0	0
204	0	0	2,764	166	0	2,930	0	0
205	0	0	8,538	672	0	9,210	0	0
206	9,910	0	0	0	9,910	0	0	0
207	5,760	18,130	0	835	10,240	14,485	0	0
208	960	2,860	0	0	320	3,500	0	0
209	0	790	0	0	0	790	0	0
210	640	1,437	0	913	2,350	640	0	0
211	192	16,138	0	0	3,840	12,490	0	0
212	3,200	6,400	22,216	1,469	19,845	13,440	0	0
213	0	0	6,041	1,459	7,500	0	0	0
215	15,549	12,040	1,280	1,921	2,945	27,845	0	0
216	3,840	42,075	3,200	1,215	5,120	42,650	2,560	0
217	1,280	2,793	0	597	640	4,030	0	0
218	4,419	0	320	111	4,530	320	0	0
219	0	470	0	0	0	470	0	0
222	0	2,950	1,280	0	0	4,230	0	0
223	0	412	0	0	0	412	0	0
400	45,065	310,658	143,600	52,297	204,098	275,828	19,397	52,297
401	0	0	160	0	0	160	0	0
403	0	400	0	0	0	400	0	0
404	0	0	3,123	0	0	3,123	0	0
405	0	4,182	4,500	0	0	8,682	0	0
406	0	548	200	0	0	748	0	0
407	0	2,521	0	0	0	2,521	0	0
408	0	0	0	55	0	0	0	55
409	0	0	3,534	0	0	3,534	0	0
410	0	0	0	285	0	0	0	285
411	636	0	0	0	636	0	0	0
412	1,773	0	0	0	1,773	0	0	0
413	1,689	0	0	0	1,089	600	0	0
415	745	0	0	40	745	0	0	40
416	0	0	0	565	0	0	0	565
417	0	0	799	50	0	799	0	50
501	2,780	0	0	0	0	2,780	0	0
502	0	5,150	0	0	1,920	3,230	0	0
503	0	3,083	0	27	0	3,110	0	0
504	0	390	0	0	0	390	0	0

Appendix F (Cont.) Existing Range Condition and Trend by Allotment

Allotment	Condition: Good (Acres)	Fair (Acres)	Poor (Acres)	Unsurveyed (Acres)	Trend: Upward (Acres)	Static (Acres)	Downward (Acres)	No Trend (Acres)
505	0	0	180	0	0	180	0	0
506	0	0	100	0	100	0	0	0
507	0	0	1,568	462	2,030	0	0	0
508	0	0	280	0	0	280	0	0
509	0	26,180	12,160	0	37,060	1,280	0	0
510	0	33,920	23,360	0	33,920	23,360	0	0
511	3,200	84,878	50,242	0	27,016	100,424	10,880	0
512	0	0	22,440	0	22,440	0	0	0
514	0	24,000	53,516	894	71,369	7,041	0	0
515	33,175	46,565	11,980	0	67,400	14,720	9,600	0
516	0	0	60,540	0	49,020	10,240	1,280	0
517	23,688	68,970	34,733	205	107,234	19,062	1,300	0
518	10,050	0	0	0	10,050	0	0	0
519	1,127	13,678	0	0	9,305	5,500	0	0
520	14,120	3,200	0	0	7,680	9,640	0	0
521	780	0	0	0	780	0	0	0
522	8,836	0	0	364	0	9,200	0	0
523	0	1,270	37,998	0	9,360	29,908	0	0
524	0	0	2,700	0	0	2,700	0	0
600	44,795	381,005	79,360	1,825	332,210	154,295	20,480	0
700	640	4,322	1,683	0	640	6,005	0	0
701	882	0	578	0	0	1,460	0	0
702	720	4,920	640	0	3,470	2,810	0	0
703	0	866	289	0	866	289	0	0
704	0	12,024	400	0	4,407	8,017	0	0
705	5,337	14,944	1,702	0	1,797	19,866	320	0
706	4,240	0	0	0	4,240	0	0	0
707	1,060	8,270	0	0	4,693	4,637	0	0
708	0	2,720	0	0	0	2,720	0	0
709	5,139	12,711	940	0	3,080	15,310	400	0
710	1,409	2,409	650	0	1,259	1,389	1,820	0
711	1,170	0	0	0	1,170	0	0	0
712	1,100	300	0	0	300	1,100	0	0
713	2,206	300	279	0	1,406	479	900	0
714	0	4,100	0	0	0	4,100	0	0
715	6,520	0	0	0	6,520	0	0	0
716	0	0	0	640	0	0	0	640
800	0	40	0	0	0	0	0	40
801	0	400	0	0	0	0	0	400
804	0	480	0	0	0	0	0	480
806	0	817	0	0	0	0	0	817
807	0	1,708	0	0	0	0	0	1,708
808	0	40	0	0	0	0	0	40
809	0	80	0	0	0	0	0	80
810	0	1,300	0	0	0	0	0	1,300
811	0	840	0	0	0	0	0	840
812	0	760	0	0	0	0	0	760
813	0	160	0	0	0	0	0	160

Appendix F (Cont.) Existing Range Condition and Trend by Allotment

Allotment	Condition: Good (Acres)	Condition: Fair (Acres)	Condition: Poor (Acres)	Condition: Unsurveyed (Acres)	Trend: Upward (Acres)	Trend: Static (Acres)	Trend: Downward (Acres)	Trend: No Trend (Acres)
814	0	840	0	0	0	0	0	840
815	0	1,680	0	0	0	0	0	1,680
816	0	440	0	0	0	0	0	440
817	0	1,080	0	0	0	0	0	1,080
818	0	200	0	0	0	0	0	200
819	0	79	0	0	0	0	0	79
820	160	0	0	0	0	0	0	160
821	0	988	0	0	0	0	0	988
822	3,122	0	0	0	0	0	0	3,122
823	0	920	0	0	0	0	0	920
825	0	760	0	0	0	0	0	760
826	0	560	0	0	0	0	0	560
827	0	349	0	0	0	0	0	349
828	0	960	0	0	0	0	0	960
829	0	760	0	0	0	0	0	760
830	0	280	0	0	0	0	0	280
831	0	0	460	0	0	0	0	460
832	1,578	0	0	0	0	0	0	1,578
833	0	40	0	0	0	0	0	40
834	0	335	0	0	0	0	0	335
835	0	320	0	0	0	0	0	320
836	900	0	0	0	0	0	0	900
837	1,249	0	0	0	0	0	0	1,249
838	600	0	0	0	0	0	0	600
839	0	3,440	0	0	0	0	0	3,440
840	0	565	0	0	0	0	0	565
841	0	348	0	0	0	0	0	348
842	0	485	0	0	0	0	0	485
845	0	500	0	0	0	0	0	500
846	0	1,260	0	0	0	0	0	1,260
847	1,921	0	0	0	0	0	0	1,921
848	0	1,044	0	0	0	0	0	1,044
849	0	480	0	0	0	0	0	480
851	0	1,083	0	0	0	0	0	1,083
852	0	2,549	0	0	0	0	0	2,549
853	688	0	0	0	0	0	0	688
855	0	1,140	0	0	0	0	0	1,140
856	0	440	0	0	0	0	0	440
857	0	760	0	0	0	0	0	760
858	1,760	4,688	0	0	0	0	0	6,448
859	370	0	0	0	370	0	0	0
860	0	545	0	0	0	0	0	545
861	0	2,520	0	0	0	0	0	2,520
862	0	2,520	0	0	0	0	0	2,520
863	0	1,360	0	0	0	0	0	1,360
864	0	0	1,440	0	0	0	0	1,440
876	740	4,060	0	0	1,600	3,200	0	0
877	375	9,225	3,280	0	9,015	3,865	0	0

Appendix F (Cont.) Existing Range Condition and Trend by Allotment

Allotment	Condition: Good (Acres)	Condition: Fair (Acres)	Condition: Poor (Acres)	Condition: Unsurveyed (Acres)	Trend: Upward (Acres)	Trend: Static (Acres)	Trend: Downward (Acres)	Trend: No Trend (Acres)
878	0	1,465	0	0	0	1,465	0	0
879	0	240	0	0	240	0	0	0
881	0	285	0	0	0	285	0	0
882	1,715	24,641	0	0	11,515	11,321	3,520	0
883	880	0	0	0	0	880	0	0
884	0	282	0	0	282	0	0	0
885	647	6,584	0	0	1,050	6,181	0	0
886	300	4,820	0	0	0	5,120	0	0
887	800	8,480	0	0	3,500	800	4,980	0
888	0	2,750	0	0	2,050	700	0	0
889	0	3,390	0	0	1,780	1,290	320	0
890	4,107	10,838	0	0	4,728	10,137	80	0
891	1,800	2,109	0	0	3,909	0	0	0
892	0	1,790	0	0	0	1,790	0	0
893	0	180	0	0	180	0	0	0
895	0	1,080	0	0	0	0	0	1,080
896	880	0	0	0	0	0	0	880
900	9,774	14,988	0	1,600	4,360	20,402	0	1,600
901	6,266	0	0	100	3,689	2,577	0	100
902	9,816	960	0	440	10,776	0	0	440
903	0	1,056	1,584	0	0	2,640	0	0
904	960	2,715	0	0	1,390	2,285	0	0
905	3,741	8,632	0	1,464	4,061	8,312	0	1,464
906	1,071	0	0	0	0	1,071	0	0
907	4,406	0	0	0	930	3,476	0	0
908	3,970	3,762	550	0	7,732	550	0	0
909	8,779	0	0	0	1,313	7,466	0	0
910	3,207	0	0	1,177	2,020	1,187	0	1,177
911	3,022	3,328	0	250	5,361	989	0	250
912	320	0	0	0	320	0	0	0
913	0	240	0	0	0	240	0	0
914	1,280	18,496	1,800	80	660	20,916	0	80
915	8,230	0	0	0	2,810	5,420	0	0
916	0	160	0	0	0	160	0	0
1000	38,160	51,150	27,520	6	70,756	45,440	640	0
1001	31,040	14,080	39,314	3,136	15,360	72,210	0	0
1002	290	1,018	1,280	0	1,288	1,300	0	0
1300	0	0	0	120	0	0	0	120
1301	0	0	0	240	0	0	0	240
1302	0	0	0	40	0	0	0	40
1303	0	0	0	280	0	0	0	280
1305	0	0	0	200	0	0	0	200
1306	0	0	0	363	0	0	0	363
1307	0	0	0	240	0	0	0	240
1308	0	0	0	120	0	0	0	120
	596,154	1,773,713	738,970	95,345	1,533,458	1,416,306	116,782	137,636

Appendix G

Average Monthly Temperatures and Precipitation for Selected Weather Stations

	Klamath Falls (4,098 ft.) 1/		Lakeview (4,778 ft.)		Paisley (4,360 ft.)	
	Precipitation (inches)	Temperature (°F)	Precipitation (inches)	Temperature (°F)	Precipitation (inches)	Temperature (°F)
January	2.24	29.7	2.29	27.8	1.46	30.8
February	1.29	34.8	1.51	32.3	.94	35.7
March	1.06	38.8	1.34	36.2	.85	38.7
April	.73	45.3	1.10	43.5	.59	45.4
May	1.13	52.8	1.73	51.1	1.34	53.1
June	.96	59.5	1.70	57.9	1.42	59.7
July	.25	67.9	.19	66.6	.37	68.1
August	.57	65.9	.37	64.2	.43	66.3
September	.49	59.8	.50	57.8	.37	53.5
October	1.25	49.4	1.32	47.9	.90	49.9
November	1.88	38.7	1.79	37.7	1.06	39.1
December	2.49	31.7	2.17	31.1	1.45	32.9
	14.34	47.9	16.01	46.2	11.18	47.7

	Hart Mtn. Refuge (5,616 ft.)		Fremont (4,512 ft.)		Adel (4,680 ft.)	
	Precipitation (inches)	Temperature (°F)	Precipitation (inches)	Temperature (°F)	Precipitation (inches)	Temperature (°F)
January	.92	27.3	1.91	27.3	1.20	33.4
February	.72	30.9	.93	31.7	.72	34.5
March	.90	33.0	.96	34.2	.74	38.8
April	.86	40.1	.55	38.4	.55	44.8
May	1.84	47.3	.75	44.3	.79	53.4
June	1.72	53.7	.81	54.4	1.44	59.9
July	.36	62.6	.40	61.0	.30	67.9
August	.43	61.3	.51	58.4	.53	66.7
September	.48	54.9	.31	51.6	.49	58.6
October	.92	45.9	.83	43.4	.67	51.0
November	.94	36.1	1.44	34.6	1.01	40.6
December	.99	29.9	1.80	26.1	1.11	33.9
	11.08	43.6	10.82	42.3	9.55	48.0

	Alkali Lake (4,332 ft.)	
	Precipitation (inches)	Temperature (°F)
January	1.03	30.9
February	.64	33.2
March	.55	37.2
April	.75	43.3
May	.79	52.2
June	1.32	58.7
July	.62	69.1
August	.67	64.0
September	.32	58.5
October	.85	48.4
November	.69	40.9
December	.83	31.5
	9.06	44.8

1/ Station elevation

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration 1978; USDI BLM 1979

Appendix H
Properties and Qualities of the Soils in the Lakeview EIS Area

Soil Unit	Classification Subgroup--Family	Slope Gradient (percent)	Bedrock or Underlying Material	Permability	Effective Root Depth (in)	Available Water Holding Capacity
1	Xerollic Camborthid--Coarse-silty, mixed, mesic	0-3	Alluvium	Mod.	60+	High
2	Xerollic Torrifluvent--Coarse-loamy, mixed, noncalcareous, mesic	0-3	Alluvium	Rapid	20-40	Low
5	Lithic Xerollic Camborthid--Loamy, mixed, frigid	0-12	Eolian	Rapid	10-20	Low
6	Xerollic Torriorthent--Coarse-loamy, mixed, noncalcareous, frigid	0-3	Alluvium	Rapid	60+	Mod.
14	Cumulic Haplaquoll--Clayey, mixed, mesic	0-3	Alluvium	Slow	60+	High
25	Xerollic Paleargid--Clayey, montmorillonitic, frigid, shallow	0-3	Lacustrine	Slow	15-24	Low
26	Xerollic Camborthid--Loamy, mixed, frigid, shallow	0-3	Lacustrine	Mod.	15-24	Low
30	Typic Pelloxerert--Montmorillonitic, frigid	0-3	Alluvium	V. Slow	20-40	Mod.
31	Xerertic Torriorthent--Fine, montmorillonitic, noncalcareous, frigid	0-3	Alluvium	V. Slow	20-40	Mod.
41	Xerertic Camborthid--Fine, montmorillonitic, mesic	0-3	Alluvium	V. Slow	20-40	Mod.
43	Fluventic Haplaquept--Coarse-silty, mixed, calcareous, mesic	0-3	Alluvium	M. Slow	60+	Mod.
44	Xerollic Natrargid--Fine-silty, mixed, mesic	0-3	Lacustrine	M. Slow	60+	Mod.
50	Xerollic Durorthid--Coarse-loamy, mixed, mesic	0-12	Alluvium	Slow	10-20	Low
50a	Xerollic Durorthid--Coarse-loamy, mixed, mesic	0-3	Alluvium	Slow	10-20	Low
51	Xerollic Camborthid--Coarse-loamy, mixed, mesic	0-12	Alluvium	M. Rapid	60+	Mod
52	Xerollic Durorthid--Sandy, mixed, frigid	0-12	Alluvium	Rapid	20-40	Low
53	Xerollic Durargid--Fine-loamy, mixed, mesic	0-12	Lacustrine	Slow	10-20	Low
54	Aquic Durorthid--Coarse-loamy, mixed, mesic	0-7	Lacustrine	Slow	5-10	Low

Soil Unit	Classification Subgroup--Family	Slope Gradient (percent)	Bedrock or Underlying Material	Permability	Effective Root Depth (in)	Available Water Holding Capacity
55	Xerollic Durargid--Fine-loamy, mixed, mesic	3-12	Alluvium	Slow	10-20	Low
56	Xerollic Durargid--Fine, montmorillonitic, mesic	3-7	Alluvium	Slow	10-20	Low
74	Lithic Xerollic Camborthid--Loamy, mixed, frigid	3-60	Volcanic	Rapid	10-20	Low
75	Lithic Xerollic Haplargid--Loamy, mixed, frigid	30-60	Volcanic	Mod.	10-20	Low
75a	Lithic Xerollic Haplargid--Loamy, mixed, frigid	3-20	Volcanic	Mod.	10-20	Low
S75	Lithic Xerollic Haplargid--Loamy-skeletal, mixed, frigid	3-35	Volcanic	Mod.	10-20	Low
76	Lithic Xerollic Paleargid--Clayey, montmorillonitic, frigid	3-20	Volcanic	M. Slow	10-20	Low
76a	Lithic Xerollic Paleargid--Clayey, montmorillonitic, frigid	3-12	Volcanic	M. Slow	10-20	Low
S76	Lithic Xerollic Paleargid--Clayey-skeletal, montmorillonitic, frigid	3-20	Volcanic	Slow	10-20	Low
77	Lithic Torrirothent--Loamy, mixed, frigid	3-60	Volcanic	Mod.	5-10	V. Low
78	Lithic Xeric Torriorthent--Sandy-skeletal, mixed, frigid	7-12	Volcanic	Rapid	10-20	V. Low
82	Pachic Cryoboroll--Fine-loamy, mixed	3-60	Volcanic	Mod.	20-40	Mod.
83	Argic Lithic Cryoboroll--Loamy, mixed	12-60	Volcanic	M. Slow	10-20	Low
84	Lithic Cryoboroll--Loamy, mixed	3-60	Volcanic	Mod.	5-10	V. Low
85	Lithic Cryoboroll--Loamy, mixed	3-60	Volcanic	Mod.	10-20	Low
87	Lithic Xerollic Haplargid--Clayey, mixed, frigid	0-20	Volcanic	Slow	10-20	Low
95	(Sand dunes)	0-20	Sand	V. Rapid	60+	V. Low
95a	(Sand dunes, alkali)	0-20	Sand	V. Rapid	60+	V. Low
96	(Rockland)	3-60	Volcanic	Vari.	Vari.	Vari.
97	(Playas)	0-3	Sed.	Vari.	Vari.	Vari.
Bj	Typic Argixeroll--Fine-loamy, mixed, frigid	3-60	Volcanic	M. Slow	40-60	Mod.
Bk	Typic Torripsamment--Mixed, frigid	0-12	Alluvium	Rapid	60+	Low
Ca	Aridic Pachic Haploxeroll--Fine-loamy, mixed, mesic	0-15	Alluvium	Mod.	40-60	High

Soil Unit	Classification Subgroup--Family	Slope Gradient (percent)	Bedrock or Underlying Material	Permability	Effective Root Depth (in)	Available Water Holding Capacity
Cr	Histic Haplaquoll--Coarse-silty, siliceous, noncalcareous, mesic	0-3	Alluvium	M. Slow	20-40	High
Dg	Xerollic Camborthid--Coarse-loamy, mixed, frigid	0-13	Pumice	V. Rapid	60+	Low
Dl	Typic Cryoboroll--Fine-loamy,mixed	3-60	Volcanic	Slow	20-60	High
Fg	Haplic Xerollic Durargid--Fine-loamy, mixed, mesic	0-3	Alluvium	Slow	20-40	Mod.
Fk	Durixerollic Camborthid--Coarse-loamy, mixed, frigid	0-3	Alluvium	Mod.	20-40	Mod.
Fo	Torriorthentic Haploxeroll--Sandy, mixed, frigid	0-5	Alluvium	Rapid	40-60	Low
Hg	Andic Cryochrept--Coarse-loamy, mixed	7-60	Volcanic	Rapid	60+	Mod.
Hn	Xerollic Durorthid--Coarse-loamy, mixed, mesic	0-2	Alluvium	Mod	20-40	Low
Ho	Fluventic Haplaquoll--Fine-loamy, mixed, frigid	0-2	Alluvium	Slow	40-60	High
Ht	Lithic Xerollic Haplargid--Clayey, mixed, frigid	3-20	Volcanic	Slow	10-20	Low
La	Cumulic Haploxeroll--Fine-loamy, mixed, mesic	0-3	Alluvium	M. Slow	30-60	High
Lf	Xerollic Durorthid--Coarse-silty, mixed, mesic	0-3	Alluvium	Slow	20-40	Mod.
Lk	Calcic Haploxeroll--Coarse-loamy, mixed, mesic	0-2	Alluvium	Mod.	40-60	High
Lr	Aridic Lithic Argixeroll--Clayey, montmorillonitic, mesic	3-60	Volcanic	Slow	10-20	Low
Mh	Xerollic Durorthid--Sandy, mixed, frigid	0-3	Alluvium	Rapid	10-20	Low
Mn	Typic Haplaquoll--Fine-loamy, mixed, calcareous, mesic	0-1	Alluvium	Slow	40-60	High
Mr	Lithic Argixeroll--Clayey, montmorillonitic, frigid	1-8	Volcanic	Slow	10-20	V. Low
Oz	Fluventic Haplaquoll--Fine-loamy, mixed, noncalcareous, mesic	0-3	Alluvium	M. Slow	60+	High
Pl	Xerollic Haplargid--Loamy-skeletal, mixed, frigid	3-60	Alluvium	M.Slow	30-60	Low
Pt	Chromic Pelloxerert--Fine, montmorillonitic, mesic	0-3	Alluvium	Slow	60+	High

Soil Unit	Classification Subgroup--Family	Slope Gradient (percent)	Bedrock or Underlying Material	Permability	Effective Root Depth (in)	Available Water Holding Capacity
Sh	Typic Cryorthent--Ashy over loamy, mixed	3-60	Pumice	Rapid	30-60	Mod.
Sk	Aridic Lithic Haploxeroll--Loamy, mixed, mesic	5-25	Lacustrine	Mod.	10-20	V. Low
Tq	Pachic Ultic Haploxeroll--Fine-loamy, mixed, frigid	3-20	Volcanic	Mod.	40-60	High
Tv	Xerollic Durargid--Fine, montmorillonitic, frigid	3-12	Alluvium	Slow	10-20	Low
Wd	Pachic Ultic Argixeroll--Loamy skeletal, mixed, frigid	7-60	Volcanic	Mod.	40-60	Mod.

Source: Cahoon and Simonson 1969;
Lindsay et al. 1969;
Lovell et al. 1969.

M = moderately
V = very

Appendix I

Soil Units Shown on Figure 2-3, General Soils

Soil Divisions on Figure 2-3	Soil Units Described in Appendix H	Total Acres 1/
Basin Land and Terrace	1,25,26,51,53,55,56, Ca,Fk,Sk,Tv	404,240
Alkali Affected	43,44,50a,54,75a,76a, 95a,Fg,Hn,Lf,Lk,Mn	95,020
Poorly Drained	14,30,31,41,97,Cr,Ho, La,Oz,Pt	107,960
Sandy	2,5,6,50,52,78,95, Bk,Fo,Mh	308,480
Ashy	Dg,Sh	30,000
Volcanic	74,75,76,82,83,87,Bj, Dl,Hg,Ht,Lr,Pl,Tq,Wd	2,034,274
Very Shallow and Very Stony	S75,S76,77,84,85,96, 99,Mr	515,280
		3,495,254

1/ Includes public, other Federal, State and private land within allotment boundaries in the EIS area.

Appendix J

Erosion Condition

Data to determine soil erosion condition were taken during Phase I Watershed Conservation and Development Inventory. Each of the Phase I representative areas were rated for the following soil surface factors: soil movement, surface litter, surface rock, pedestalling, flow patterns, rills and gullies. Each factor was allotted points according to erosion conditions. The points were then totaled and an erosion condition class assigned based on a 0 to 100 scale. The following classes are used:

Erosion Condition Class	Points
Stable	0-20
Slight	21-40
Moderate	41-60
Critical	61-80
Severe	81-100

Appendix K

Range of Selected Water Quality Parameters

	Temperature (°F)	Dissolved Oxygen (mg/l)	Fecal Coliforms (counts/100ml)	pH	Turbidity (JTU)[1/]	Number of Samples
Lost River at Harpold Dam	40-75	6.4-11.1	45-2400	7.7-8.5	3-63	16 (1968-1975)
Lost River at Wilson Bridge	43-78	3.0-12.3	60-450	7.9-8.8	5-44	8 (1971-1975)
Lost River at Merrill Road Bridge	32-73	0-12.1	435	6.8-8.4	3-36	11 (1970-1975)
Honey Creek at Plush	45-52	8.1-11.5	620	7.9-9.1	3	2 (1965,1977)
Chewaucan R., 0.5 mi. above Paisley Mill	34-75	8.1-10.5	60-230 [2/]	7.4-8.9	1-144	7 (1965-1973)
Chewaucan R. at Hwy. 31	43-68	5.4-10.7	230	7.6-8.2	3-85	4 (1965,1977)

1/ Jackson Turbidity Units

2/ Total coliforms

Source: ODEQ 1980. Unpublished computer printout.

Appendix L

Riparian Inventory

METHODS

This riparian habitat inventory method was adapted from Lee (1974). The procedure establishes temporary, 30-foot diameter plots (0.016 acres) located along streams where the components of the riparian community show distinguishable changes. Where the riparian area was clearly homogenous, plots were inventoried 1/4 to 1/3 mile apart. The components of the riparian community that were considered in determining plot locations include:

(1) Density and canopy of the vegetation
(2) Species composition, particularly trees and shrubs
(3) Understory vegetation and/or ground cover
(4) Riparian width (differences of 50 percent or more)
(5) Stream stability, water velocity and turbidity
(6) Adjacent soil types and bank rock content
(7) Percent slope

The vertical strata and the basal cover of each plot were diagrammed. Width, direction of flow and percent shading of the stream in each plot was recorded. Channel stability was measured and rated as described by Duff and Cooper (1976:47), using USDI Form 6671-3. The width of the riparian zone was estimated and recorded for both sides of the creek. Vegetation was inventoried according to percentage of basal canopy cover for each stratum. Vertical strata were divided into four height categories (0-3 feet, 3-10 feet, 10-20 feet, 20+ feet) for the tree and shrub elements of the components of the community. Grasses and forbs were considered to be one stratum. Thus, 10 vertical strata were estimated--4 tree, 4 shrub, 1 grass, 1 forb. Basal coverage for each stratum followed the Modified Reconnaissance Sampling method described by Pfister (1977).

A general description of each plot was recorded. The percent cover of bareground occurring as any combination of dirt, sand and/or rock was estimated.

Notation was made regarding the presence and extent of trampling, both human and livestock. The vegetation use by cattle was rated as "none", "low", "moderate", or "high"-- and in some cases "very high". Mammals and birds were recorded if seen or heard, or if tracks, droppings, burrows, nests, etc., were observed.

RATING SYSTEM

As with any rating system, the divisions are very subjective and somewhat arbitrary. The 27 possible points for the seven elements are shown in Table L-1. Condition ratings were assigned as follows:

27 Possible Points

0-6 = Poor	13-19 = Good
7-12 = Fair	20-27 = Excellent

After each plot was rated as described, individual scores were tabulated. Each creek, or clearly distinguishable riparian type along each creek was grouped as a unit and an average riparian rating was obtained by dividing the total score by the number of plots. An adjusted riparian rating was obtained by multiplying the rating score by the size of the riparian type. The resultant scores were combined and divided by the total area of the riparian zone. By this adjustment, small plots with excellent ratings were weighted against extensive areas of low ratings. The variation between the two proved to be slight.

Stream stability ratings followed Form 6671-2 guidelines (Example follows Table L-1).

Table L-1 Riparian Rating System

	Total possible points
Percent Stream Shading	
0-10%= 0 pts 11-50%= 1 pts. 51-100%= 2 pts.	2
Stream Stability (Form 6671-3)	
115+ = 0 pts. 77-114= 1 pts. 39-76 = 2 pts. 38 & below 3 pts	3
Tree Canopy	
1) less than 3' stratum 0-10%= 0 pts. 11-50= 1 pts. 51-100%= 2 pts	2
2) 3-10' stratum as 1) above	2
Shrub Canopy	
1) less than 3" stratum as 1) above	2
2) 3-10" stratum as 1) above	2
3) 10-20" stratum as 1) above	2
4) 20" to 10' stratum as 1) above	2
5) 10-20' stratum as 1) above	2
6) 20' + stratum as 1) above	2
Grass/Forb Canopy Combined basal coverage of all plants minus that of invader species. 0-10%= 0 pts. 11-50%= 1 pts. 51-100%= 2 pts	2
Avian Species Diversity 0-2 species= 0 pts. 3-4 species= 1 pts. 5+ species= 2 pts	2
Snags 0 snags present = 0 pts 1-2 snags " = 1 pts 3+ " " = 2 pts	2
TOTAL	27

Appendix M

Criteria for Evaluating Stream Conditions

Stream fisheries habitat ratings were obtained by walking along streams and documenting their physical and biological characteristics every one-quarter mile. Some factors measured and rated were channel stability, stream bank damage, physical habitat condition, water quality and aquatic insects. Written observations were supported with color photos. Each one-quarter mile section was given an overall rating, based on measurements and observations.

Habitat Quality	Definition
Poor	- Natural stream habitat drastically altered; very little or no present trout production.
Fair	- Stream substantially altered from natural conditions due to past or present activities, habitat either partially recovered or still decreasing in trend; some trout production but population is far below potential for streams.
Good	- Stream only slightly altered from natural conditions, very limited habitat changes or almost complete recovery; satisfactory trout population for stream.
Excellent	- Stream habitat virtually unchanged from natural conditions or is highly productive for aquatic life; trout production at potential for stream.

Appendix N Interindustry Models

Interindustry models for Lake and Klamath Counties developed by the Forest Service Region 6 for the year 1977 were used to estimate the contribution of the livestock industry to the local economy and to estimate the effects of changes in economic activities. Summary information for these two models is shown in Tables N-1 and N-2.

An interindustry (or input-output) model is a summary of all the transactions occurring in an area during a one-year period, showing for each industry or economic sector the amount of its purchases from each industry (inputs) and the amount of its sales to each industry (outputs). This information represents the interindustry relationships in the area, and permits the estimation of how a change in one industry would affect other industries and the economy as a whole.

When a specific change occurs in the economy, such as an increase in cattle sales due to increased forage availability, the cattle industry purchases more from its suppliers, ranch families spend more, and so on. Recipients of these purchases increase their purchases. The end result of this process is increased income and employment throughout the economy. Its measure is called a Type II multiplier. It relates the total change in income or employment to the original change in final demand (e.g., cattle sales).

Type II multipliers derived from the models for use in the statement are shown in Table N-3.

Table N-1 Summary Measures, Lake County Interindustry Model, 1977

Sector	Final Demand ($1000)	Total Gross Output ($1000)	Personal Income ($1000)	Labor (Jobs)
Agriculture	10,989.253	20,074.998	4,123.003	806.011
Agriculture Service, Forest Fish	.051	1,808.000	635.006	23.992
Construction	277.779	317.000	284.999	58.001
Lumber and Wood Products	30,020.293	44,782.996	6,615.792	386.029
Printing and Publishing	203.108	283.000	171.000	13.001
Transportation, Communication and Utilities	3,210.026	5,319.000	916.996	62,020
Wholesale Trade	106.739	553.000	497.999	56.998
Auto Dealers and Gas Stations	1,774.453	2,072.000	971.996	67.008
Eating and Drinking Establishments	688.341	722.000	636.999	119.996
Other Retail Trade	4,477.447	4,592.000	1,545.989	123.934
Finance, Insurance and Real Estate	1,201.142	3,847.000	559.008	51,011
Lodging	68.227	117.000	105.000	91.999
Other Services	1,251.256	1,826.000	1,580.001	156.999
Private Sectors Total	54,268.112	86,313.984	18,643.785	2,017.051
Government and Miscellaneous		11,011.000	9,910.000	891.000
Total	54,268.112	97,324.984	28,553.785	2,908.051

Source: U.S. Department of Agriculture, Forest Service Region 6, RARE II Studies, 1977 County Input-Output Models, 1980

Table N-2 Summary Measures, Klamath County Interindustry Model, 1977

Sector	Final Demand ($1000)	Total Gross Output ($1000)	Personal Income ($1000)	Labor (Jobs)
Agriculture	46,845.703	68,501.992	10,476.010	2,124.932
Agriculture Service, Forest, Fish	.126	9,767.999	1,219.046	142.027
Construction	17,650.623	20,354.999	13,867.046	679.043
Nondurable Goods Mfg.	5,969.150	9,453.999	2,134.996	162.987
Lumber and Wood Products	222,535.701	320,327.957	77,362.404	4,497.404
Printing and Publishing	281.506	2,754.000	1,187.001	90.001
Durable Goods Manufacturing	5,306.858	9,457.999	5,755.003	375.010
Transportation, Communications and Utilities	47,521.793	76,972.994	26,481.019	1,424.770
Wholesale Trade	7,519.609	21,761.998	10,724.095	833.920
Auto Dealers and Gas Stations	11,229.336	14,299.999	7,138.988	611.039
Eating and Drinking Establishments	4,623.023	4,981.000	4,483.000	997.993
Other Retail Trade	30,456.598	31,673.999	19,744.937	1,955.869
Finance, Insurance and Real Estate	16,375.639	41,426.997	8,118.863	664.903
Lodging	3,052.837	3,722.000	2,414.015	465.994
Other Services	24,008.434	54,271.997	31,165.151	2,506.824
Private Sectors Total	443,377.012	689,729.875	222,271.566	17,532.715
Government and Miscellaneous		53,721.000	47,969.000	4,535.000
Total	443,377.012	743,450.875	270,240.566	22,067.715

Source: U.S. Department of Agriculture, Forest Service Region 6, RARE II Studies, 1977 County Input-Output Models, 1980

Table N-3 Type 2 Multipliers 1/, 1977 Interindustry Models
Lake and Klamath Counties

(Ratios of respective amounts to final demand)

	Gross Sales (per dollar)	Personal Income (per dollar)	Jobs (per $1,000)
		LAKE COUNTY	
Grazing	2.3254	.5577	.0925
Hunting 2/	1.5573	.7538	.1014
Fishing 3/	2.0310	1.0109	.2122
Other Recreation 4/	1.6369	.7542	.1188
Construction 5/	2.1401	1.3253	.2290
		KLAMATH COUNTY	
Grazing	2.1694	.5231	.0693
Construction	1.9397	1.09407	.0670

1/ Change in private gross sales, income or jobs per unit change in final demand (local expenditure from an outside source). Represents the total effect on the local economy produced by an initial expenditure as well as the purchases of the initial recipient and the re-spending of others including households throughout the local economy. Excludes any effect on the government sector. See text.

2/ Based on expenditure pattern for big game hunting in 1975 National Survey of Hunting, Fishing and Wildlife Associated Recreation (prepared for U.S. FWS).

3/ Based on expenditure pattern for cold water fishing in 1975 National Survey of Hunting, Fishing and Wildlife Related Recreation.

4/ Based on expenditure pattern for day use in 1975 State Park Visitor Survey: Survey Report of Oregon Department of Transportation, Parks and Recreation Branch.

5/ Construction industry multipliers for Lake County were not used because they appeared unreasonably high. Multipliers for Klamath County were used to estimate construction impacts on the local economy.

Derived from interindustry models for Lake and Klamath Counties.

Source: U.S. Dept. of Agriculture, Forest Service Region 6, RARE II Studies, 1980.

Appendix O
Ranch Budgets: Linear Programming Process

From data gathered in a random sample of ranchers using public forage in Lake and Harney Counties, the Economics and Statistics Service of the Department of Agriculture (Gee 1981) constructed representative budgets for cattle-calf operations based on typical feed-buying patterns, public forage use, pasture and hay land use, use of supplemental protein, fuel, hired labor and other factors of production. The value of sales was based on average price in each sales category for the 1977-79 period. Items of costs were valued in the best judgment of the analysts using local data where available. The data were used to construct a simulated profit maximization operation termed a linear programming model. For a description of linear programming, see William J. Baumol, Economic Theory and Operations Analysis, 1972.

The model optimizes the return above cash cost for the rancher taking into account the physical limitations of the operation and price constraints. The model incorporates the influence of seasonal variations in public forage and capacity limitations such as feed or rangeland availability.

Table O-1 through O-4 show the ranch budgets developed for each herd size class. Tables O-5 through O-8 show the results of the analysis.

The average return above cash costs per AUM for Lake and Harney County ranchers was used to calculate return above cash costs for Klamath County ranches in each herd size class.

Table 0-1 Ranch 0-99 Head

Item	Unit	Number	Average weight	Price / Cwt	Total Value
Sales:					
Steer calves	Head	11	455	$ 69.15	$ 3,461
Heifer calves	Head	6	432	56.25	1,458
Yearling steers	Head	14	675	64.63	6,108
Yearling heifers	Head	11	610	55.17	3,702
Cull cows	Head	6	974	35.00	2,045
Total					$ 16,774
Total/cow					$ 266.25

Cash costs:	Total Value	Value/ Cow
BLM grazing fee	$ 225	$ 3.57
Forest grazing fee	--	--
Private range lease/rent	--	--
State lease	--	--
Hay (produce)	1,628	25.84
Hay (purchase)	--	--
Protein supplement	816	12.95
Irrigated pasture	209	3.32
Salt and mineral	128	2.03
Concentrate feeds	--	--
Veterinary and medicine	307	4.87
Hired trucking	248	3.94
Marketing	222	3.52
Fuel and lubricants	563	8.94
Repairs	339	5.38
Taxes	399	6.33
Insurance	382	6.06
Interest on operating capital	335	5.32
General farm overhead	648	10.29
Other cash costs	--	--
Hired labor	116	1.84
Total cash costs	$ 6,565	$104.21
Other Costs:		
Family labor	$ 2,262	$ 35.90
Depreciation	1,891	30.02
Interest on investment		
Other than land	5,304	84.19
Interest on land	14,648	232.51
Total other costs	$24,105	$382.62
Total all costs	$30,670	$486.83
Return above cash costs	$10,209	$162.05
Return above cash costs and family labor	7,947	126.14
Return to total investment	6,056	96.13
Return to land	752	11.94

Production Assumptions: Herd size 63 cows, 21 cows per bull; replacement rate 12%; cow loss 3%; calving rate 83%; calf loss birth to weaning 5%; 43% of steers sold as calves; 36% of heifers sold as calves.

Table 0-2 Ranch Budget, 100-399 Head

Item	Unit	Number	Average weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	12	440	$ 69.15	$ 3,651
Heifer calves	Head	35	383	56.25	7,540
Yearling steers	Head	71	856	64.63	39,280
Yearling heifers	Head	20	738	55.17	8,143
Cull cows	Head	22	1,025	35.00	7,893
Total					$ 66,507
Total/cow					$ 318.22

Cash costs:	Total Value	Value/ Cow
BLM grazing fee	$ 569	$ 2.72
Forest grazing fee	1,573	7.53
Private range lease/rent	3,435	16.44
State lease	--	--
Hay (produce)	7,270	34.78
Hay (purchase)	--	--
Protein supplement	1,484	7.10
Irrigated pasture	550	2.63
Salt and mineral	502	2.40
Concentrate feeds	570	2,73
Veterinary and medicine	1,099	5.26
Hired trucking	1,250	5.98
Marketing	857	4.10
Fuel and lubricants	2,341	11.20
Repairs	2,610	12.49
Taxes	677	3.24
Insurance	1,480	7.08
Interest on operating capital	2,033	9.73
General farm overhead	1,450	6.94
Other cash costs	2,082	9.96
Hired labor	8,389	40.14
Total cash costs	$ 40,221	$ 192.44
Other Costs:		
Family labor	$ 6,074	$ 29.06
Depreciation	4,807	23.00
Interest on investment		
Other than land	16,680	79.81
Interest on land	42,761	204.60
Total other costs	$ 70,322	$ 336.47
Total all costs	$110,543	$ 528.91
Return above cash costs	$ 26,286	$ 125.77
Return above cash costs and family labor	20,212	96.71
Return to total investment	15,405	73.71
Return to land	-1,275	-6.10

Production Assumptions: Herd size 209 cows; 22 cows per bull; 14% replacement rate cow loss 3%; calving rate 86%; calf loss birth to weaning 7%; 14% of steers sold as calves; 64% of heifers sold as calves.

Table 0-3 Ranch Budget, 400-999 Head

Item	Unit	Number	Average weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	39	455	$ 69.15	$ 12,271
Heifer calves	Head	35	425	56.25	8,367
Yearling steers	Head	193	780	62.20	93,636
Yearling heifers	Head	122	658	55.17	44,288
Cull cows	Head	63	992	35.00	21,874
Total					$ 180,436
Total/cow					$ 314.90

Cash costs:	Total Value	Value/ Cow
BLM grazing fee	$ 2,085	$ 3.65
Forest grazing fee	1,726	3.01
Private range lease/rent	6,419	11.20
State lease	321	.56
Hay (produce)	16,600	28.97
Hay (purchase)	--	--
Protein supplement	8,056	14.06
Irrigated pasture	2,504	4.37
Salt and mineral	1,232	2.15
Concentrate feeds	--	--
Veterinary and medicine	1,885	3.29
Hired trucking	3,152	5.50
Marketing	779	1.36
Fuel and lubricants	7,329	12.79
Repairs	7,713	13.46
Taxes	3,232	5.64
Insurance	5,472	9.55
Interest on operating capital	4,743	8.28
General farm overhead	3,341	5.83
Other cash costs	1,381	2.41
Hired labor	16,216	28.30
Total cash costs	$ 94,186	$ 164.37
Other Costs:		
Family labor	$ 18,000	$ 31.41
Depreciation	10,280	17.94
Interest on investment		
Other than land	43,139	75.29
Interest on land	165,964	289.64
Total other costs	$ 237,383	$ 414.28
Total all costs	$ 331,569	$ 578.65
Return above cash costs	$ 86,250	$ 150.52
Return above cash costs and family labor	68,250	119.11
Return to total investment	57,970	101.17
Return to land	14,831	25.88

Production Assumptions: Herd size 573 cows; 21 cows per bull; 13% replacement rate; cow loss 2%; calving rate 87%; calf loss birth to weaning 7%; 17% steers sold as calves; 22% heifers sold as calves.

Table 0-4 Ranch Budget, 1,000 Head and Over

Item	Unit	Number	Average weight	Price Cwt	Total Value
Les:					
Steer calves	Head	507	448	$ 69.15	$ 157,065
Heifer calves	Head	141	422	56.25	33,470
Yearling steers	Head	468	745	64.63	225,339
Yearling heifers	Head	424	666	55.17	155,791
Cull cows	Head	358	946	35.00	118,534
Total					$ 690,199
Total/cow					$ 269.40

sh costs:	Total Value	Value/ Cow
BLM grazing fee	$ 12,884	$ 5.03
Forest grazing fee	1,762	.69
Private range lease/rent	28,282	11.04
State lease	--	--
Hay (produce)	78,163	30.51
Hay (purchase)	--	--
Protein supplement	38,148	14.89
Irrigated pasture	10,271	4.01
Salt and mineral	5,124	2.00
Concentrate feeds	5,739	2.24
Veterinary and medicine	8,890	3.47
Hired trucking	8,557	3.34
Marketing	4,868	1.90
Fuel and lubricants	12,016	4.69
Repairs	25,056	9.78
Taxes	8,275	3.23
Insurance	5,047	1.97
Interest on operating capital	17,050	6.65
General farm overhead	10,043	3.92
Other cash costs	9,633	3.76
Hired labor	45,552	17.78
Total cash costs	$ 335,360	$ 130.90
ıer Costs:		
Family labor	$ 16,089	$ 6.28
Depreciation	46,604	18.19
Interest on investment		
Other than land	197,851	77.23
Interest on land	428,879	167.40
Total other costs	$ 689,423	$ 269.10
al all costs	$1,024,783	$ 399.99
Return above cash costs	$ 354,839	$ 138.50
Return above cash costs and family labor	338,750	132.22
Return to total investment	292,146	114.03
Return to land	94,295	36.81

Production Assumptions: Herd size 2,562 cows; 19 cows/bull; 16% replacement rate; cow loss 2%; calving rate 81% calf loss birth to weaning 6%; 52% steers sold as calves; 25% of heifers sold as calves.

Table 0-5 Ranch Budget Results, 0-99 Head 1/

Item	1979 Permitted Use	Alternative #3 Short run	Alternative #3 Long run	Alternative #4 Short run	Alternative #5 Short run	Eliminate BLM Grazing	Proposed Action Long run
			(Dollars)				
Gross income	16,816	18,518	21,208	18,213	17,891	14,548	18,593
Total cash costs	6,588	6,970	7,575	6,902	6,829	6,077	6,987
Value of family labor	2,268	2,498	2,860	2,457	2,413	1,962	2,508
Depreciation	1,891	1,921	1,968	1,916	1,910	1,852	1,922
Interest on investment other than land	5,314	5,728	6,381	5,654	5,576	4,764	5,746
Return above cash costs	10,228	11,548	13,633	11,311	11,062	8,471	11,606
Return above cash costs and family labor	7,960	9,050	10,773	8,854	8,649	6,509	9,098
Return to total investment	6,069	7,129	8,805	6,938	6,739	4,657	7,176
Return to land	755	1,401	2,424	1,284	1,163	-107	1,430
			(Head)				
Herd size	63.16	69.55	79.66	68.41	67.20	54.64	69.83
			(Hours)				
Family Labor	605	666	763	655	643	523	669
Hired Labor	31	34	39	34	33	27	34

1/ Several of the alternatives yielded AUMs practically identical with other alternatives analysed; therefore, the duplicates were not run. Specifally, the Proposed Action (Short run) summary is the same as Alternative #3 (Short run). Alternative #4 (Long run) summary is the same as the Proposed Action (Long run) summary. Alternative #5 Long Term is the same as Alternative #4 Short Term

Table 0-6 Ranch Budget Results, 100-399 Head 1/

Item	1979 Permitted Use	Proposed Action Short run	Proposed Action Long run	Alternative #3 Long run	Alternative #4 Short run
			(Dollars)		
Gross income	66,535	69,131	70,397	74,740	68,613
Total cash costs	40,301	41,328	41,829	42,147	41,124
Value of family labor	6,076	6,313	6,429	6,826	6,266
Depreciation	4,808	4,848	4,867	4,934	4,840
Interest on investment other than land	16,687	17,219	17,479	18,370	17,113
Return above cash costs	26,234	27,803	28,568	32,593	27,489
Return above cash costs and family labor	20,158	21,490	22,139	25,767	21,223
Return to total investment	15,350	16,642	17,272	20,833	16,383
Return to land	-1,337	-577	-207	2,463	-730
			(Head)		
Herd size	209.09	217.25	221.23	234.88	215.63
			(Hours)		
Family Labor	1,620	1,683	1,714	1,820	1,671
Hired Labor	2,238	2,325	2,368	2,514	2,308

1/ One of the alternatives yielded AUMs practically identical with another alternative analysed; therefore, the duplicate was not run. Specifically, Alternative #3 (Short run) summary is the same as the Proposed Action (Short run) summary.

Table 0-6 (continued)

Item	Alternative #4 Long run	Alternative #5 Short run	Alternative #5 Long run	Eliminate BLM Grazing
		(Dollars)		
Gross income	69,617	67,838	69,065	60,076
Total cash costs	41,521	40,817	41,302	37,745
Value of family labor	6,358	6,195	6,307	5,486
Depreciation	4,855	4,828	4,847	4,708
Interest on investment other than land	17,319	16,954	17,206	15,362
Return above cash costs	28,096	27,021	27,763	22,331
Return above cash costs and family labor	21,738	20,826	21,456	16,845
Return to total investment	16,883	15,998	16,609	12,137
Return to land	-436	-956	-597	-3,225
		(Head)		
Herd size	218.78	213.19	217.05	188.80
		(Hours)		
Family Labor	1,695	1,652	1,682	1,463
Hired Labor	2,342	2,282	2,323	2,021

Table O-7 Ranch Budget Results, 400-999 Head

Item	1979 Permitted Use	Proposed Action Short run	Proposed Action Long run	Alternative #3 Short run	Alternative #3 Long run
			(Dollars)		
Gross income	180,569	180,863	190,026	180,980	202,887
Total cash costs	94,282	94,381	97,447	94,420	101,751
Value of family labor	18,011	18,040	18,955	18,052	20,237
Depreciation	10,282	10,286	10,422	10,288	10,612
Interest on investment other than land	43,166	43,227	45,126	43,252	47,792
Return above cash costs	86,287	86,482	92,579	86,560	101,136
Return above cast costs and family labor	68,276	68,442	73,624	68,508	80,899
Return to total investment	57,994	58,156	63,202	58,220	70,287
Return to land	14,828	14,929	18,076	14,968	22,495
			(Head)		
Herd size	573.42	574.36	603.45	574.73	644.30
			(Hours)		
Family Labor	4,803	4,811	5,055	4,814	5,397
Hired Labor	4,328	4,335	4,554	4,337	4,863

Table 0-7 (continued)

Item	Alternative #4 Short run	Alternative #4 Long run	Alternative #5 Short run	Alternative #5 Long run	Eliminate BLM Grazing
			(Dollars)		
Gross income	179,935	188,094	176,649	184,945	159,249
Total cash costs	94,070	96,801	92,970	95,746	87,147
Value of family labor	17,948	18,762	17,620	18,448	15,885
Depreciation	10,273	10,394	10,224	10,347	9,967
Interest on investment other than land	43,035	44,726	42,354	44,073	38,748
Return above cash costs	85,865	91,293	83,679	89,199	72,102
Return above cash costs and family labor	67,917	72,531	66,059	70,751	56,217
Return to total investment	57,644	62,137	55,835	60,404	46,250
Return to land	14,609	17,411	13,481	16,331	7,502
Herd size	571.41	597.32	(Head) 560.97	587.32	505.72
Family Labor	4,786	5,003	(Hours) 4,699	4,919	4,236
Hired Labor	4,312	4,508	4,234	4,432	3,817

Table O-8 Ranch Budget Results, 1,000 and Over Head

Item	1979 Permitted Use	Proposed Action Short run	Proposed Action Long run	Alternative #3 Short run	Alternative #3 Long run
			(Dollars)		
Gross income	690,252	689,964	738,480	691,524	835,140
Total cash costs	335,712	335,629	349,542	336,077	377,261
Value of family labor	16,091	16,084	17,215	16,120	19,468
Depreciation	46,605	46,598	47,634	46,632	49,697
Interest on investment other than land	197,876	197,804	209,892	198,193	233,974
Return above cash costs	354,540	354,335	388,938	355,447	457,879
Return above cash costs and family labor	338,449	338,251	371,723	339,327	438,411
Return to total investment	291,844	291,653	324,089	292,695	388,714
Return to land	93,968	93,849	114,197	94,502	154,740
			(Head)		
Herd size	2,562.19	2,561.12	2,741.21	2,566.91	3,100.01
			(Hours)		
Family Labor	4,292	4,290	4,592	4,300	5,193
Hired Labor	12,145	12,140	12,993	12,167	14,694

Table 0-8 (continued)

Item	Alternative #4 Short run	Alternative #4 Long run	Alternative #5 Short run	Alternative #5 Long run	Eliminate BLM Grazing
			(Dollars)		
Gross income	664,138	699,802	677,865	726,740	585,262
Total cash costs	328,224	338,452	332,161	346,175	305,606
Value of family labor	15,482	16,313	15,802	16,941	13,643
Depreciation	46,047	46,808	46,340	47,383	44,364
Interest on investment other than land	191,370	200,255	194,790	206,967	171,718
Return above cash costs	335,914	361,350	345,704	380,565	279,656
Return above cash costs and family labor	320,432	345,037	329,902	363,624	266,013
Return to total investment	274,385	298,229	283,562	316,241	221,649
Return to land	83,015	97,974	88,772	109,274	49,931
			(Head)		
Herd size	2,465.25	2,597.64	2,516.21	2,697.63	2,172.47
			(Hours)		
Family Labor	4,129	4,351	4,215	4,519	3,639
Hired Labor	11,685	12,313	11,927	12,787	10,298

Appendix P

Sediment Yield from Construction of Range Improvements

In estimating sediment yield from construction activities, average values as would be found in the EIS area were assumed for all columns on Form 7310-16 for the present situation, which came to an existing sediment yield of 0.6 ac-ft/mi^2/yr. It was further assumed that only the ground cover and land use columns would change due to removal of ground cover during construction. Values of 10 were assumed for these two columns from construction of: fences, springs, wells, pipelines, guzzlers, reservoirs, waterholes, seeding/burn, brush control/burn; values of 8 were predicted for: seeding/chain, brush control/chain, juniper control; values of 8 for land use and 5 for ground cover were assumed for seeding/spray. No change was predicted for brush control/spray since the soil surface would not be disturbed and the dead vegetation would be left on the ground. Using these assumptions, the short term sediment yield for the EIS area increases by 1.24 percent under the proposed action, 4.42 percent under Alternative 3, .98 percent under Alternative 4 and 1.87 percent under Alternative 5. No range improvements would be constructed under Alternatives 1 and 2.

GLOSSARY

GLOSSARY

Acre-foot - The volume of water that will cover 1 acre to a depth of 1 foot.

Active Preference - That portion of the total grazing preference for which grazing use may be authorized.

Actual Use - See Permitted Use.

Allotment - An area of land where one or more operators graze their livestock. Generally consists of public land but may include parcels of private or state lands. The number of livestock and season of use are stipulated for each allotment. An allotment may consist of one or several pastures.

Allotment Management Plan (AMP) - An intensive livestock grazing management plan dealing with a specific unit of rangeland, based on multiple use resource management objectives. The AMP considers livestock grazing in relation to the renewable resources -- watershed, vegetation and wildlife. An AMP establishes the season of use, the number of livestock to be permitted on the range and the range improvements needed.

Alluvial - Pertaining to material that is transported and deposited by running water.

Animal Unit Month (AUM) - The amount of forage required to sustain the equivalent of one cow with one calf, or their equivalent for one month.

Annual Vegetative Growth - The amount of forage or herbage produced during one growing season.

Archeoloic Resources - All physical evidence of past human activity, other than historical documents, which can be used to reconstruct lifeways and cultural history of past peoples. These include sites, artifacts, environmental data and all other relevant information.

Area of Critical Environmental Concern (ACEC) - An area within the public lands where special management attention is required (when such areas are developed or used, or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards (FLPMA Sec. 103(a)).

Authorized Use - The total number of AUMs authorized for grazing each year.

Background - That area from 3-5 miles to 15 miles from the viewer.

Browse - That part of leaf and twig growth of shrubs, woody vines and trees available for animal consumption.

Carrying Capacity - The maximum number of animals an area can sustain without inducing damage to vegetation or related resourses, such as watershed.

Concentration Area - An area where factors such as terrain, water, vegetation, fences or management practices result in livestock congregation. Generally, these areas are grazed more heavily than surrounding areas.

Contrast Rating - A method of determining the extent of visual impact for an existing or proposed activity that will modify any landscape feature.

Critical Growing Period - The portion of a plant's growing season, generally between flowering and seed dissemination, when food reserves are being stored and seeds produced. Grazing after the start of this date is detrimental due to inadequate moisture for supporting further plant growth later in the season.

Crucial Habitat - A relatively small part of an animal's range or habitat which is essential for the animal's existence because it contains special qualities or features (e.g., water holes, winter food and cover, nesting trees, strutting ground, upland meadow).

Cultural Resources - A term that includes resources of paleontologic, archeologic or historic significance which are fragile, limited, and non-renewable portions of the human environment.

Direct Income - Earnings from production of workers in a specified industry. See Indirect Income.

Dissolved Oxygen Saturation - The amount of gaseous oxygen (O) dissolved in a liquid - usually water.

Distance Zones - The area that can be seen as foreground, middleground, background or seldom seen.

Ecologically Significant Areas - Areas identified as having unique elements or components of natural diversity related to plant communities, aquatic types, special plant and animal species and/or outstanding natural features. These areas may possess scientific, educational, cultural and/or recreational benefits.

Erosion - Detachment and movement of soil or rock fragments by water, wind, ice or gravity.

Exclosure - An area fenced to exclude livestock and wild horses.

Fecal Coliform - A group of bacteria used as an indicator of sanitary quality in water.

Forage Production - The amount of forage that is produced within a designated period of time on a given area (expressed in AUMs or pounds per acre.) This is the proportion of total annual vegetation production which is palatable to livestock.

Forb - Any non grasslike herbaceous plant.

Foreground - That area from 0 miles to 0.5-1 miles.

Grazing Preference - See Total Preference.

Groundwater - Subsurface water that is in the zone of saturation.

Gully - A channel, usually with steep sides, through which water commonly flows during and immediately after rains or snow melt.

Habitat Diversity - The relative degree or abundance of plant species, communities, habitats or habitat features (e.g. topography, canopy layers) per unit of area.

Herb - A seed-producing plant that does not develop persistent woody tissue.

Herbage - Herbaceous plant growth, especially fleshy, edible plants.

Herbaceous Plants - Plants having little or no woody tissue.

Indirect Income - Earnings or personal income to workers outside a specified industry generated by production in that industry. For example, personal income to those outside the livestock industry generated by the business and personal expenditures of the livestock industry as well as successive rounds of expenditures which may result in the community. Indirect income as defined here includes induced income.

Infiltration - The gradual downward flow of water from the surface through soil to groundwater.

Intermittent Stream - A stream or portion of a stream that flows only in direct response to precipitation. It receives little or no water from springs and no long-continued supply from melting snow or other sources. It is dry for a large part of the year, ordinarily more than 3 months.

Key Species - A plant that is a relatively or potentially abundant species. It should be able to endure moderately close grazing and serve as an indicator of changes occurring in the vegetational complex. The key species is an important vegetative component that, if overused, will have a significant effect on watershed conditions, grazing capacity, or other resource values. More than one key species may be selected on an allotment. For example, a species may be important for watershed protection and a different species may be important for livestock forage or wildlife forage, etc.

Limiting Factor - A component of the environment which regulates animal populations (e.g., food, water, cover).

Litter - A surface layer of loose, organic debris, consisting of freshly fallen or slightly decomposed organic materials.

Livestock Forage Production - see Forage Production.

Management Framework Plan (MFP) - Land use plan for public lands which provides a set of goals, objectives and constraints for a specific planning area to guide the development of detailed plans for the management of each resource.

Middleground - That area between the foreground and 3 to 5 miles from the viewer.

National Natural Landmark - Areas of national significance designated by the Secretary of Interior which contain outstanding representative example(s) of the nation's natural heritage, including terrestrial communities, aquatic communities, landforms, geological features, habitats of native plant and animal species, or fossil evidence.

National Register of Historic Places - Established by the Historic Preservation Act of 1966, the Register is a listing maintained by the Heritage Conservation and Recreation Service of architectural, historical, archeologic and cultural sites of local, state or national significance.

Paleontology - A science dealing with the life of past geological periods as known from fossil remains.

Pasture - A fenced subdivision of a grazing allotment capable of being grazed by livestock independently from the rest of the allotment.

Perennial Stream - A stream or portion of a stream that flows year long. It receives water from precipitation, springs, melting snow and/or groundwater.

Permits/Leases - Under Section 3 of the Taylor Grazing Act, a permit is a document authorizing use of the public lands within grazing districts for the purpose of grazing livestock. Under Section 15 of the Taylor and Grazing Act, a lease is a document authorizing livestock grazing use of public lands outside grazing districts.

Permitted Use - See Authorized Use.

pH - The negative logarithm of the hydrogen ion concentration. A low pH indicates an acid, and a high pH indicates an alkaline substance. A pH of 7.0 is considered neutral.

Planning Area Analysis (PAA) - A planning document which analyzes the relationship of social and economic data to the physical and biological data presented in a Unit Resource Analysis (URA).

Plant Composition - The proportions of various plant species annual production in relation to the total annual production of all plants on a given area.

Plant Maturity - That point in the growing season when an individual plant species has set seed, stored food reserves and gone into the dormant stage. This time is different for various species.

Plant Vigor - See Vigor

Preference - See Total Preference and Active Preference.

Proprietor - One who owns and operates their own business; one engaged in economic activity on their own account and not as an employee. Farm or ranch proprietor need not own the land used.

Public Land - Formal name for lands administered by the Bureau of Land Management.

Range Condition - As it is used in this document, range condition defines the relative condition of the forage stand and the site-soil mantle. The major factors considered in the determination of condition were plant composition, protective cover and the present rate of erosion.

Range Improvement - A structure, action or practice that increases forage production, improves watershed and range condition or facilitates management of the range or the livestock grazing on it.

Range Trend - A measure of the direction of change in range condition.

Research Natural Areas - Areas established and maintained for research and education. The general public may be excluded or restricted where necessary to protect studies or preserve research natural areas. Lands may have: (1) Typical or unusual faunistic or floristic types, associations, or other biotic phenomena, or (2) Characteristic or outstanding geologic, pedologic or aquatic features or processes.

Residual Ground Cover - That portion of the total vegetative ground cover that remains after the livestock grazing season.

Rest - As used in this statement, refers to deferment of grazing on a range area (pasture) to allow plants to replenish their food reserves.

Rill - A small, intermittent water course with steep sides, usually only a few inches deep.

Riparian - Related to wet areas associated with streams, springs, seeps, and meadows.

Runoff - That portion of the precipitation on a drainage area that is discharged from the area in stream channels, including both surface and subsurface flow.

Soil Surface Factor - A rating of erosion condition based on a scale of 0 to 100. See Appendix J for methodology.

State Historic Preservation Office (SHPO) - The official within each State, authorized by the State at the request of the Secretary of the Interior, to act as a liaison for purposes of implementing the National Historic Preservation Act of 1966.

Thermal Cover - Vegetation or topography that prevents radiational heat loss, reduces wind chill during cold weather, and intercepts solar radiation during warm weather.

Total Preference - The total number of animal unit months of livestock grazing on public lands, apportioned and attached to base property owned or controlled by a permittee or lessee. The active preference and suspended preference are combined to make up the total grazing preference.

Turbidity - The cloudy condition caused by suspended solids in a liquid.

Unallotted Lands - Public lands which currently have no authorized livestock grazing.

Unit Resource Analysis - A BLM planning document which contains a comprehensive inventory and analysis of the physical resources and an analysis of their potential for development, within a specified geographic area.

Upland - All rangelands other than riparian or wetland areas.

Useable Forage Production - The maximum stocking rate that with a particular kind of livestock and grazing system will maintain a static or upward trend in ecosite condition. This incorporates such things as the suitability of the range to grazing as well as the proper use which can be made on the plants within the area. Normally expressed in terms of acres per animal unit month (ac/AUM) or sometimes referred to as the total AUMS that are available in any given area, such as an allotment. Areas that are unsuitable for livestock use are not considered to be part of the useable forage production.

Utilization - The proportion of the current year's forage production that is consumed or destroyed by grazing animals. This may refer either to a single species or to the whole vegetative complex. Utilization is expressed as a percent by weight, height or numbers within reach of the grazing animals. Four levels of utilization are used in this document: light (21-40%), moderate (41-60%), heavy (61-80%), and severe (81-100%).

Vegetation Allocation - In reference to forage, the distribution of the available forage production to the various resource needs such as wildlife, livestock, wild horses and nonconsumptive use.

Vegetation Manipulation - As used in this statement, refers to seeding, brush control and juniper control range improvements.

Vegetation Type - A grouping of plant communities which have similar dominant plant species.

Vegetative Ground Cover - The percent of the land surface covered by all living and undecomposed remnants of vegetation within 20 feet of the ground.

Vigor - The relative well-being and health of a plant as reflected by its ability to manufacture sufficient food for growth, maintenance and reproduction.

Visual Contrast - The effect of a striking difference in the form, line, color or texture of the landscape features in the area being viewed.

Visual Resource - The land, water, vegetation, animals and other features that are visible on all public lands.

Visual Resource Management (VRM) Classes - The degree of alteration that is acceptable within the characteristic landscape. It is based upon the physical and sociological characteristics of any given homogenous area.

Water Yield - The amount of water discharged in streams.

Wetland - Related to wet areas associated with lakes, reservoirs and marshes.

Wilderness Inventory - An evaluation of the public lands in the form of a written description and map showing those lands that meet the wilderness criteria as established under Section 603(a) of FLPMA and Section 2(c) of the Wilderness Act.

Wilderness Review - The term used to cover the entire wilderness inventory, study, and reporting phases of the wilderness program of the Bureau.

Wilderness Study Area - A roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act of 1976 and Section 2(c) of the Wilderness Act of 1964.

Work Year - One person working the full-time equivalent of one year.

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N

OREGON

Portland The Dalles Salem Baker Prineville Eugene Vale Burns Coos Bay Roseburg HIGH DESERT AREA Medford Klamath Falls Lakeview

LOCATION MAP

SCALE IN MILES

LEGEND

- Public Land
  - Within Allotments
  - Unallotted
  - Fenced in with U.S.F.S.
- U.S. Forest Service
- State Land
- Summer Lake Game Management Area
- Resource Area Boundary
- Allotment Boundary
- 400 Allotment Numbers
- (395) U.S. Highway
- (31) State Highway
- Other Major Roads
- Vegetation Manipulation Projects – Proposed Action
  - Spray/Seed
  - Burn/Seed
  - Chain/Seed
  - Brush Control / Burn

Figure 1-1A

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

HIGH DESERT RESOURCE AREA

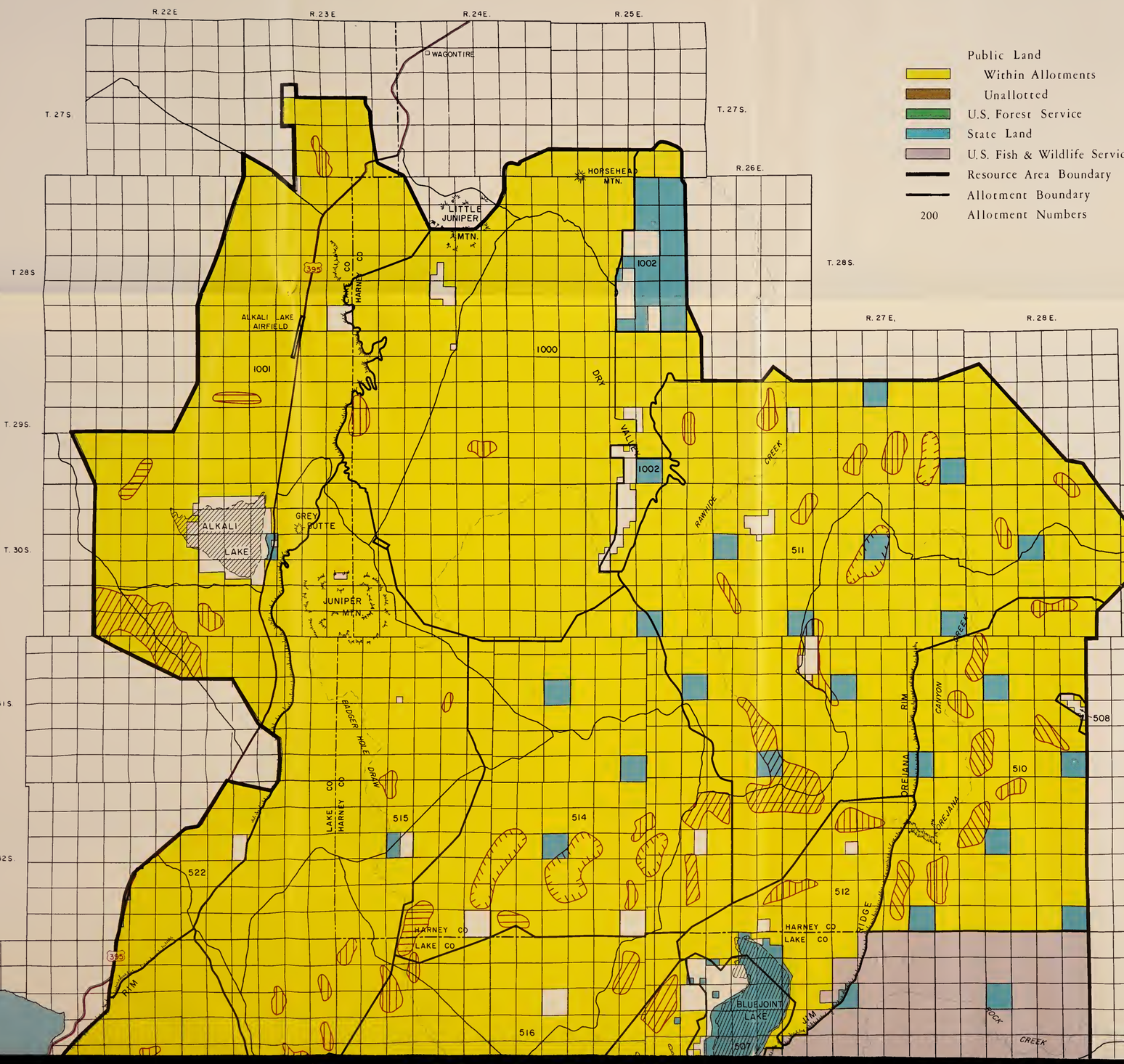
Lakeview Grazing Management Environmental Impact Statement

1981

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

WARNER LAKES RESOURCE AREA

Lakeview Grazing Management
Environmental Impact Statement
1981



LEGEND

- Public Land
  - Within Allotments
  - Unallotted
- U.S. Forest Service
- State Land
- U.S. Fish & Wildlife Service
- Resource Area Boundary
- Allotment Boundary
- 200 Allotment Numbers

- 395 U.S. Highway
- 31 State Highway
- Other Major Roads
- Vegetation Manipulation Projects — Proposed Action
  - Spray/Seed
  - Burn/Seed
  - Chain/Seed
  - Brush Control/Spray
  - Brush Control/Burn

Figure 1-1B

LOCATION MAP

SCALE IN MILES

ABERT LAKE
MULE LAKE
VALLEY FALLS
COLVIN LAKE
RABBIT BASIN
RABBIT HILLS
COYOTE HILLS
TURPIN LAKE
STONE CORRAL LAKE
UPPER CAMPBELL LAKE
CAMPBELL LAKE
FLAGSTAFF LAKE
MUD/SWAMP
SWAMP LAKE
ANDERSON LAKE
REFUGE HEADQUARTERS
HART MOUNTAIN ANTELOPE REFUGE
WARNER PEAK
HART LAKE
PLUSH
COX BUTTE
LONE GRAVE BUTTE
BEATYS BUTTE
DRAKE PEAK
CRUMP LAKE
ROBISON LAKE
FISHER LAKE
PELICAN LAKE
GREASER LAKE
BIG LAKE
GUANO LAKE
SHIRK LAKE
BUCKAROO PASS
ACTNEY MTN.
HAWK MTN.
BLIZZARD GAP
Colderwood Res.
Mud Lake Res.
Flynn Res.
Spalding Res.
MC Res.
Little Res.
Barry Res.
Pluke Res.
Friday Res.
ABERT CREEK
RABBIT CREEK
SNYDER CREEK
SILVERTIP CREEK
McDOWELL CREEK
FISH CREEK
TWELVEMILE CREEK
DRAKE CREEK
DEEP CREEK
TWENTYMILE CR
FIFTEENMILE CR
N. FORK TWELVEMILE CREEK
WARNER VALLEY
BIG VALLEY
GRAND VALLEY
DAUGHERTY RIM
COLEMAN RIM
GREASER RIM
ISHAM CREEK RIM
SPALDING
T. 34 S.
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R. 28 E.
R 29 E.
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R. 31 E.
CALIFORNIA
MODOC CO
OREGON
NEVADA
LAKE CO
WASHOE CO
HARNEY CO
HUMBOLDT CO

R.7 E. R.8 E. R.9 E. R.10 E. R.11 E. R.12 E. R.13 E.

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T.38 S.

T.39 S.

T.40 S.

T.41 S.

R.8 E. R.9 E. R.10 E. R.11 E. R.12 E. R.13 E. R.14 E.

UPPER KLAMATH LAKE

NAYLOR MTN.

Whiteline Res.

SWAN LAKE

SWAN LAKE RIM

MEADOW LAKE

KLAMATH FALLS

ALTAMONT

LAKE EWAUNA

OLENE

NUSS LAKE

LOST RIVER

KLAMATH RIVER

MIDLAND

SPRING LAKE

SYKEL MTN.

KLAMATH HILLS

MERRILL

DAIRY

ALKALI LAKE

BONANZA

SPRAGUE RIVER

BEATTY

YAINAX BUTTE

PANKEY LAKE

LORELLA

BOGGS LAKE

LONG LAKE

BRYANT MTN.

Bryant Mtn. Res.

Harpold Res.

Worlow Res.

Threemile Res.

Big Adobe Res.

Dog Hollow Res.

Copeland Res.

MILLER CREEK

BENNETT CREEK

MALIN

OREGON CALIFORNIA

KLAMATH CO SISKIYOU CO MODOC CO KLAMATH CO

97 140 66 39 70

LOCATION MAP

Portland The Dalles Salem Baker Prineville Eugene Vale Burns Coos Bay Roseburg Medford Klamath Falls Lakeview LOST RIVER R.A.

SCALE IN MILES

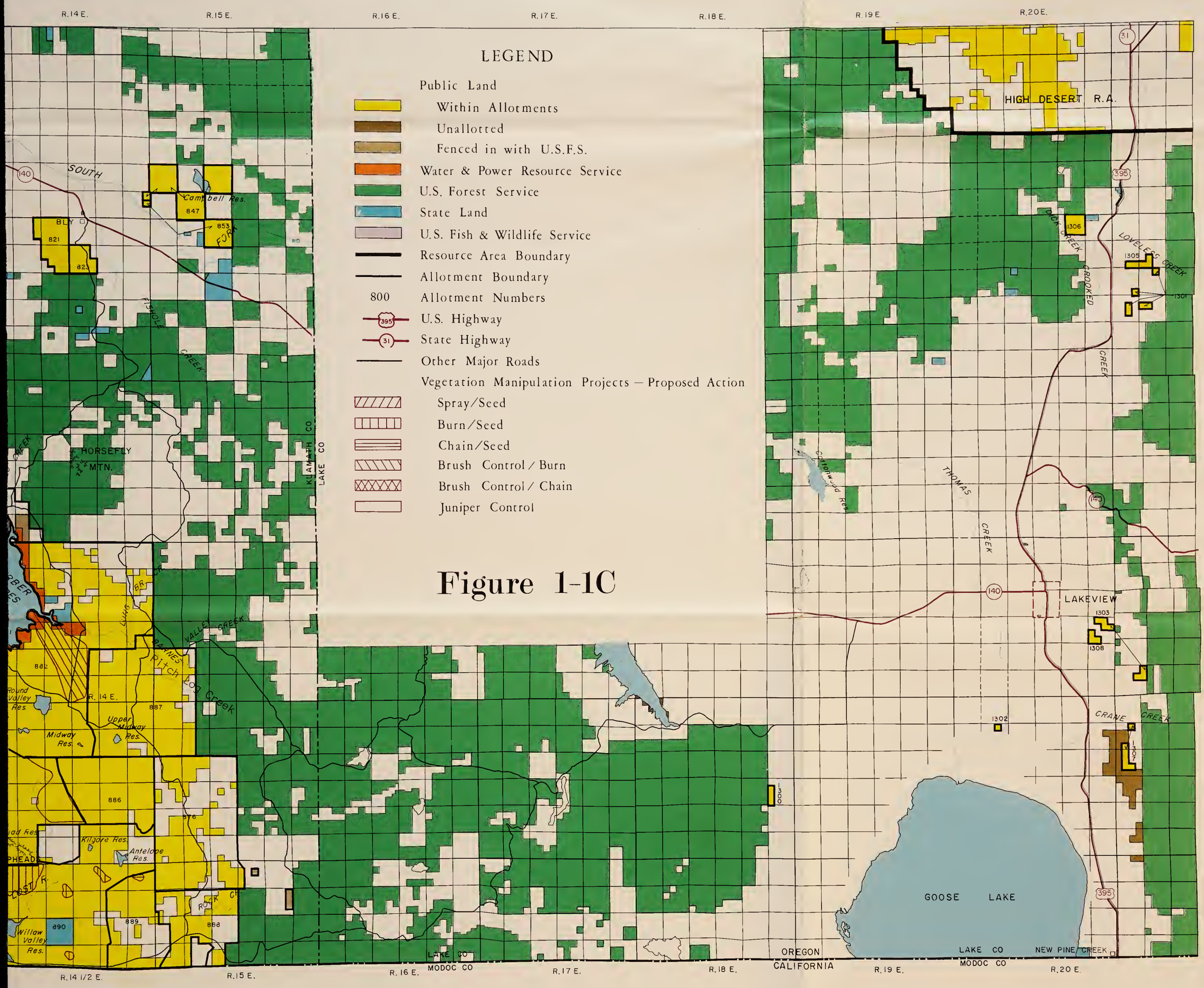

Figure 1-1C

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT

LOST RIVER RESOURCE AREA

Lakeview Grazing Management Environmental Impact Statement

1981

3 maps enclosed