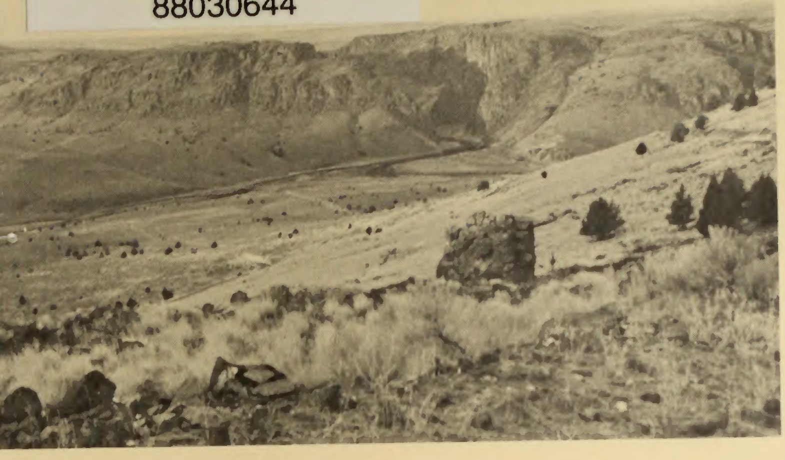

OWYHEE GRAZING ENVIRONMENTAL IMPACT STATEMENT DRAFT

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

NOTICE TO READER

PLEASE RETAIN YOUR COPY OF THIS DRAFT, SINCE THE FINAL EIS WILL INCLUDE ONLY CHANGES, CORRECTIONS AND PUBLIC COMMENTS RELATING TO THE DRAFT

DRAFT

ENVIRONMENTAL STATEMENT

OWYHEE GRAZING
ENVIRONMENTAL IMPACT STATEMENT

Prepared By

BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR

Idaho State Director, Bureau of Land Management

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Boise District Office
230 Collins Road
Boise, Idaho 83702

IN REPLY REFER TO

OWY/EIS 1792

We have forwarded for your review and comment the Draft Owyhee Grazing Environmental Impact Statement. This draft has been prepared by a team of resource specialists from the Bureau of Land Management's Boise District.

Please keep your copy of the draft, as only an abbreviated final will be printed. The final environmental impact statement will be prepared using the comments received through the public review process on contents of the draft. The final will contain a history of consultation and coordination and an addendum section recording changes made in the draft. This approach will result in substantial cost savings, since only the responses to comments and the corrections and modifications will printed. Thus, this document must be used in conjunction with the abbreviated final, which will be distributed at a later date.

Two public hearings will be scheduled for the purpose of receiving oral and written testimony on this document. The hearings will be held on separate days in Marsing and Boise, Idaho in late May or early June, 1980. Information regarding the specific location and time of each hearing will be publicized later. We have attached further information on the public hearings, including a registration form should you choose to testify. In order to have a list of witnesses available in the Boise District Office one day before the hearing, we must have the registration forms in this office at the close of business two days prior to the scheduled hearings. Should you have any questions concerning the hearings, please call our team leader, Ted Milesnick at (208) 334-1290.

Written comments are invited, and these must be received on or before June 9, 1980, to be considered in the preparation of the final environmental impact statement. Oral and written comments will receive equal consideration in the final environmental impact statement. Written comments are to be submitted to:

Bureau of Land Management
Owyhee Grazing EIS
Boise District Office
230 Collins Road
Boise, Idaho 83702

We look forward to your comments and thank you for your past and future assistance in our efforts to manage public lands in the best interests of all concerned.

Sincerely yours,

D. Dean Bibles
District Manager

Enclosures (2)
1. Hearings Handout
2. Registration Form

HEARINGS HANDOUT

GENERAL INFORMATION REGARDING THE PUBLIC HEARINGS ON THE DRAFT OWYHEE GRAZING ENVIRONMENTAL IMPACT STATEMENT.

Public Hearing Locations

Marsing, Idaho

and

Boise, Idaho

Authority

The hearings are held pursuant to the objectives of the National Environmental Policy Act (PL 91-190; 83 Stat. 852,853).

Purpose

The hearings are for the purpose of receiving comments (testimony) on the analysis of the proposed action and the five (5) alternatives addressed in the draft environmental impact statement. Testimony presented at these hearings will be used in the preparation of the final environmental impact statement.

Composition of the Hearing Panel

The public hearing proceedings will be conducted by a hearing leader. The hearing leader will be accompanied by Bureau of Land Management personnel involved in preparation of this draft environmental impact statement. The hearing leader of bureau personnel recognized by the leader may ask questions of the witness for the purpose of clarifying points in the testimony. All proceedings of the hearing will be recorded for use in preparation of the final document.

Oral Statements

Persons wishing to give testimony will be limited to ten (10) minutes, with written submissions invited at the hearing.

Prior to giving testimony at the public hearing, participants are requested to complete the attached hearing registration form. Registration forms may also be obtained by contacting Ted Milesnick, Team Leader, Bureau of Land Management, Boise District Office, 230 Collins Road, Boise, Idaho 83702, telephone (208) 334-1290. Registration forms must be returned to the above address at least two days prior to the scheduled date of the hearing. Participants may register at the registration desk prior to the hearing. Time preferences for presentation of oral statements will be honored whenever possible. A tentative listing of speakers, in the order they will be called, will be available at the registration desk at each hearing.

After the last witness has been heard, the hearing leader will consider the request of other persons present and wishing to testify. Only one witness will be allowed to represent the view points of a single organization. However, any witness will be permitted to give relevant testimony if it is offered as the views or opinions of a private citizen.

General

Witnesses must direct their testimony to the contents of the document and to specific aspects of the proposed Owyhee range management proposal or alternatives to the proposal.

Written Statements

Written statements from those unable to attend the hearing should be addressed to:

Bureau of Land Management
Owyhee Grazing EIS
Boise District Ofice
230 Collins Road
Boise, Idaho 83702

Written statements will be accepted on or before June 9, 1980.

PUBLIC HEARINGS REGISTRATION FORM

For public hearings on the draft Owyhee Grazing Environmental Impact Statement.

(Please Print)

To: Bureau of Land Management, Boise District Office, Owyhee Grazing EIS, 230 Collins Road, Boise, Idaho 83702.

From: Name ____________________

Street Address ____________________

City, State ____________________ Zip Code ____________

Representing ____________________

I wish to appear at the public hearing on ____________________, 1980, to express my views.

I intend to submit written documentation: Yes ________ No ________

____

Signature

Verbal testimony will be limited to 10 minutes; written testimony will be accepted at the above address until close of business on June 9, 1980. Registration forms are to be submitted to the Boise District Office before the close of business two days prior to the hearing.

OWYHEE GRAZING ENVIRONMENTAL IMPACT STATEMENT

(X) Draft ( ) Final Environmental Impact Statement

Department of the Interior
Bureau of Land Management

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

2. Abstract: The Bureau of Land Management proposes to implement an intensive range management program on 1,014,296 acres of public lands in southwestern Idaho and southeastern Oregon. This statement analyzes the economic, social and environmental effects of the proposal and five alternatives. The proposal and alternatives analyze different levels of vegetative allocations to wildlife, livestock, wild horses and other uses. It analyzes alternative methods by which livestock grazing would be managed as well as necessary support facilities (i.e., water development, fencing, brush control and revegetation projects).

3. Comments Must Be Received By: June 9, 1980

4. Send Comments To: Bureau of Land Management
Boise District Office
230 Collins Road
Boise, Idaho 83704

5. For More Information, contact: Oscar E. Anderson, Owyhee Area Manager or Ted Milesnick, Team Leader at the above address
Telephone (208) 334-1290

SUMMARY

The Bureau of Land Management proposes to implement an intensive range management program on 1,014,296 acres of public land in southwestern Idaho and southeastern Oregon (Map 1-1). The purpose of the proposal is to improve soil, vegetation, watershed, wildlife and other resource conditions and to provide adequate forage to stabilize the local livestock industry. The proposal and five alternatives were developed to analyze different levels of wildlife, livestock and wild horse use.

Alternative methods by which livestock grazing would be managed as well as necessary supporting facilities (i.e., water development, fencing, brush control and revegetation projects) are addressed.

Alternatives considered are 1) No Livestock Grazing, 2) No Action, 3) Maximize Wildlife and Watershed Conditions, 4) Sixty Percent Use Levels, and 5) Maximize Livestock Use.

There were several major issues identified during the EIS scoping process. The proposed level of use for livestock, wildlife and wild horses and the local and regional economic impact from this proposed level of use was a major issue. The range, watershed and wildlife condition responses to proposed management as well as the management of riparian habitat and stream areas were also identified as significant issues.

Summary Description of Proposed Action

Vegetation for consumptive use would be allocated to livestock, wild horses, deer, antelope and bighorn sheep. Vegetation would be allocated to satisfy reasonable wildlife numbers determined during the BLM planning process. Wild horses would be managed within a range of 118 head to 178 head. Initial livestock use would increase on 30 allotments, decrease on 81 allotments and on 32 unalloted grazing areas, permits would be issued. Overall, the total active grazing preference would be reduced from 113,122 AUMs to 78,336 AUMs (31 percent). Adjustments in livestock use on intensive management allotments would be implemented within a three-year period based on additional actual use and utilization data.

Three levels of management intensity would be applied. Intensive management, which includes aplication of livestock grazing management systems would be applied to 95 percent of the EIS area. Rest rotation, deferred rotation and seasonal grazing systems are proposed. Less intensive management would be applied to three percent of the area. Specific grazing systems are not proposed in this area because of the small percentages of public land. The BLM would assist the State Land Department and Soil Conservation Service in developing grazing systems. Management in association with private lands would be applied to two percent of the area. Allotments within this category are predominantly private land. Livestock use could be made any time of the year.

Special riparian management practices would be applied to 64 fenced stream miles. Log structures would be placed on streambanks an additional 86 stream miles to discourage livestock trailing along stream bottoms. Implementation of the proposal would require development of 81 springs, 90 reservoirs, 24 miles of pipeline, 100 watering troughs and 153 miles of fence. Thirteen miles of fence would be removed. Sagebrush and juniper control is proposed on 172,000 acres. An additional 67,000 acres would receive brush control and be artificially revegetated.

Proposed Action - Environmental Consequences

Competition for forage between wild horses, livestock and wildlife would decrease. Vegetative trends would stabilize or improve on most areas. Vegetative treatment practices would replace sagebrush and juniper with grass and forbs. Useable forage would increase from 82,817 Animal Unit Months (AUMs) to 146,757 AUMs. Cover increases from improved range conditions on native range and land treatment areas would cause a nine percent decrease in annual erosion rates. The overall watershed condition would improve slightly.

Wildlife habitat would improve on most areas. The proposal would reduce forage competition and benefit mule deer, antelope and bighorn sheep populations. There would be season-of-use conflicts with livestock during the late fall on mule deer winter ranges (25 allotments). This would adversely impact the deer herd on these allotments.

Providing deferred and rest pastures throughout the EIS area would periodically eliminate competition on critical nesting and brood rearing areas. Sage grouse and waterfowl populations would benefit.

Fisheries would improve on most streams, with the most significant improvement occurring on fenced streams. The fisheries habitat condition would improve to good on 58 of the 64 fenced stream miles within ten years. Unfenced streams would improve at a slower rate, but most would be in fair condition in 20 years. Fisheries associated water quality and quantity factors would improve on most steams. Fish food abundance would improve and fish populations would increase.

Wild horses would benefit from lower livestock use levels. Sixteen miles of new fence would limit movement of horses and confine them during the livestock grazing season. Additional water development and vegetative treatment would expand wild horse distribution and provide additional forage.

Slight adverse impacts to some cultural resource sites would occur from increased livestock concentrations in previously ungrazed or lightly grazed areas. Some cultural resource site deterioration from erosion would cease.

Development of range improvements and establishment of grazing systems would have a slight adverse effect on visual resources. Most proposed projects, however, are located in the lower quality visual resource management areas. The quality of hunting and fishing opportunities would improve. Hunting and fishing use would increase by 20,400 activity occassions above current trend levels. The quality of off-road vehicle use would slightly decrease.

Most livestock operators would be faced with initial short-term reductions. In the long-term, livestock use would be approximately 29,000 AUMs above current active preference of 113,122 AUMs. Initial livestock reductions would cause adverse social impacts to those operators receiving reductions.

Income losses over the 20-year period would be significant. The net present worth of rancher income losses would be -$3.3 million. The net present worth of regional, state and national income losses would be -$6.5 million. Approximately 21 of the 83 operators would have difficulty remaining in business.

Alternative #1 - No Livestock Grazing

Under this alternative, all livestock grazing would be eliminated. Forage on public lands would be reserved for wildlife and wild horses. Wild horses would be allowed to increase to 338 head. All fences except boundary fences around the EIS area and wild horse area would be removed. No project development or vegetative treatment projects for livestock management would be allowed.

Alternative #1 - Environmental Consequences

Elimination of livestock grazing would slowly improve vegetation conditions. Downward trending areas would stabilize, static areas would exhibit upward trends, and areas in fair or good ecological condition with upward trends would improve one condition class. Riparian vegetation would show significant improvement.

Soil erosion would decrease eighteen percent from existing rates as a result of increased vegetative cover and litter. Watershed conditions and wildlife habitat would improve. Elimination of vegetative treatment projects would hinder vegetative improvement and subsequent wildlife habitat conditions. Riparian associated wildlife species would benefit.

Fisheries habitat condition would show more improvement than in any of the alternatives. Fisheries water quality, quantity and community richness would improve significantly. Fish populations would also show marked increases.

Wild horse numbers would be allowed to increase to 338 head and would be positively affected by improved forage availability and removal of fences. Impacts on cultural resource sites due to livestock grazing would cease. There would be a high enhancement of scenic quality. Recreation quality and activity occasions would increase.

Livestock operators would be adversely affected by complete elimination of livestock grazing. Income losses over 20 years would be significant. The net present worth of rancher income losses would be

-$15.7 million. The net present worth of regional, state and federal income losses would be -$23.2 million. Approximately 43 of the 83 operators would have difficulty remaining in business.

Alternative #2 - No Action

The current livestock grazing program would continue. The active grazing preference would remain at 113,122 AUMs. This alternative assumes that average annual licensed use would remain at 105,009 AUMs. Wild horse numbers would be managed at levels described in the proposed action. Specific forage allocations to wild horses and wildlife are not made. No additional project development or land treatment projects to benefit livestock grazing would occur.

Alternative #2 - Environmental Consequences

This alternative would continue present resource conditions and trends. The overall vegetative condition class would be slightly worse, with most of the area being in poor condition. Plants would maintain their low to moderate vigor on areas where trend is static and further decline on areas exhibiting downward trends. The overall productivity of the vegetation would gradually decline because of the overuse of the forage. Soil erosion rates are currently exhibiting upward trends and would continue. Annual erosion rates would be four percent less than present.

Riparian and stream habitat conditions would remain poor. Associated wildlife species and fish populations would be adversely impacted by livestock grazing. Water quality would remain in poor or fair condition.

The condition of mule deer, antelope and sage grouse habitat would be variable, with some improving and some declining. Deer and antelope populations would increase slightly provided favorable climatic conditions exist. Bighorn sheep habitat is in good condition and would not change.

Wild horses and livestock forage competition would continue. Allotment pasture fences would restrict wild horse movements. Livestock would continue to impact 63 known cultural resource sites. Visual resource quality would decline slightly. Recreation quality would decline. However, recreation use for those activities being significantly affected by the proposal or alternatives would increase from 273,000 activity occasions to 441,000 activity occasions. This would occur as a result of continuing recreation trends.

Livestock operators would be allowed to continue their present operations. There would be no income losses.

Alternative #3 - Maximize Wildlife and Watershed Conditions

Grazing management systems identified in the proposed action would be implemented with stocking rates based on biological limit utilization levels (approximately 30-50 percent; see Glossary). On 45 allotments, turn out dates would be approximately two weeks to one month later than described in the proposed action. Livestock grazing would not be allowed on critical deer winter ranges after September 1. To protect riparian habitat, 113 miles of stream would be fenced, and log structures placed on 36 miles of streambanks. No vegetative treatment projects would be implemented.

Wildlife would be managed at levels described in the proposed action. Wild horses would be allowed to increase to 338 head. Initial livestock use would be reduced from 113,122 AUMs to 56,507 AUMs.

Alternative #3 - Environmental Consequences

This alternative would significantly improve vegetative conditions. Ecological conditions are expected to improve on all allotments. In twenty years, most of the range would be in fair or good condition. Soil erosion rates would decline by seventeen percent from improved vegetative conditions and increased ground cover. Watershed conditions would show significant improvement.

This alternative also provides the most benefits to wildlife. Later turn out dates, improved range conditions, lower utilization levels and elimination of livestock conflicts on deer winter ranges would significantly improve wildlife habitat conditions. Aquatic wildlife would benefit from fencing 113 miles of stream. This would significantly improve fisheries habitat condition and increase fish populations. Fisheries habitat improvement, water quality improvement and fish populations would be greater than in other alternatives except the no grazing alternative.

Wild horses would benefit from reduced livestock competition and improved range condition. Impacts from fencing on wild horse ranges would be the same as described for the proposed action. Impacts to cultural resource sites would slightly decrease. Visual quality would be moderately enhanced, recreation quality and use would increase.

Most livestock operators would be faced with initial reductions in use. Over a 20-year period, some operators would regain this use. The average grazing preference in 20 years (104,219 AUMs) would be eight percent below the current active preference. The net present worth of rancher income losses would be -$6.2 million. The net present worth of regional, state and national income losses would be -$8.9 million.

Approximately 25 of the 83 operators would have difficulty remaining in business.

Alternative #4 - Sixty Percent Utilization Level

This alternative would implement grazing management systems as described in the proposed action, except stocking rates on intensive management allotments would be based on 60 percent utilization levels in place of 50 percent utilization levels. Initial livestock use (93,421 AUMs) would be seventeen percent below current active preference. Protective fencing of stream and riparian habitat would not occur. However, log structures would be placed along 149 stream miles to protect streambanks. Project development and land treatments would be developed as described in the proposed action. Management on less intensive allotments and allotments managed with private lands would remain as described in the proposed action.

Alternative #4 - Environmental Consequences

Implementation of grazing systems with stocking rates based on 60 percent utilization levels would create a more gradual improvement in plant vigor and range condition than described in the proposed action. Riparian zone vegetation would show little improvement, with most areas expected to be in poor or fair condition in twenty years. Erosion rates would decrease by seven percent from increased vegetative cover. Watershed conditions would improve.

Wildlife habitat conditions would improve, correspondent to vegetative condition improvement. Fisheries habitat would improve slightly and aquatic wildlife populations would increase.

Increasing livestock use in allotments containing wild horses would increase the competition for forage.

There would be a slight improvement in scenic quality; recreation quality and use would increase.

Implementation of grazing systems at 60 percent use levels would decrease the level of livestock reductions. Adverse social and economic impacts would also decrease over levels described for the proposed action. The net present worth of rancher income losses would be -$1.3 million. The net present worth of regional, state and national income losses would be -$4.0 million. Approximately fourteen of the 83 operators would have difficulty remaining in business.

Alternative #5 - Maximum Livestock Use

Grazing management systems would be implemented without changing existing AUM levels (113,122 AUMs) or seasons-of-use. Water development and pasture fencing would remain as described in the proposed action. Protective stream fencing would not occur. Maximum acreages of land treatment are proposed (brush control, 154,000 acres; brush control and seeding, 198,000 acres; Map 2-5). These range treatment projects would be designed to maximize livestock forage production and would not contain multiple use design features. Wild horses would be managed at levels described in the proposed action (118-178 head). No specific forage allocation is made to wildlife.

Alternative #5 - Environmental Consequences

Implementation of grazing systems at current active preference levels would create variable responses. On allotments where current carrying capacities are less than active preference, impacts would be adverse. Beneficial impacts would result on allotments where current carrying capacities exceed active preference. The overall vegetative condition class would change little from existing levels on native range. Vegetative treatments which would create stabilized condition and trends, are designed for ranges in poor or fair condition.

Livestock forage production would increase significantly from the large areas proposed for land treatment. The condition of riparian areas would continue to decline.

Overall, soil erosion rates would decrease by approximately six percent. There would be an increased potential for erosion on land treatment areas above that described in the proposed action because treatments would occur on steeper slopes.

Overall, water quality and fisheries habitat condition would decline. Fish populations would decrease slightly. Other wildlife habitat conditions would decline from implementing large acreages of land treatment without provisions for wildlife habitat protection. Visual resources would be adversely affected by the large acreages of land treated. Recreation quality and hunting and fishing activity use would decline.

Economically, this alternative would be the most beneficial to livestock operators. There would be an increase in rancher net income. The net present worth of these income increases would be $+1.0 million. The net present worth of regional, state and national income losses would be -$1.9 million.

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CHAPTER 1
PURPOSE AND NEED

This Environmental Impact Statement is being prepared to assist the decision maker and the public in assessing the social, economic and environmental impacts of an intensive range management program on 1,014,296 acres of public rangeland administered by the Bureau of Land Management. The EIS area is located in Owyhee County, southwestern Idaho and Malheur County, southeastern Oregon (Map 1-1). The underlying purpose of the proposal and alternatives is to manage the rangeland for optimum protection, maintenance and improvement of the basic soil, vegetative and water resources as required by the 1934 Taylor Grazing Act and the 1976 Federal Land Policy and Management Act. It is also intended to provide adequate forage to stabilize the local livestock industry.

During the bureau's planning process for the Owyhee area, field inventories identified numerous resource problems and conditions which require management action.

The range management program eventually selected will be designed to improve these conditions. Inventories identified that approximately 90 percent of the rangeland is currently in poor or fair ecological condition. Soil erosion, although stabilized, is occurring at rates 25 percent higher than what would occur under excellent condition. Approximately 90-100 percent of the mule deer habitat is in poor or fair condition and 100 percent of the antelope habitat is in poor or fair condition. Bighorn sheep habitat is generally in fair or good condition. Almost all sage grouse nesting habitat was identified as being in poor or fair condition. Fisheries habitat condition, water quality and quantity is poor or fair on almost all important fisheries streams. Cultural resource sites were identified as being in good condition, with 12.5 percent of the known sites deteriorating from livestock trampling and erosion. Overall recreation quality is high, but the quality of hunting and fishing is declining. Forage conflicts between livestock, wildlife and wild horses were identified on many areas.

The goal of the proposed action and it's alternatives is to improve these resource conditions and provide sufficient forage to stabilize the livestock industry dependent upon forage from the public lands.

The scope of the environmental statement and a determination of sensitive and significant issues was determined through informal public contact and public meetings held on September 24 and 25, 1979. A public handout was prepared to inform the public of the tentative proposed action, alternatives and major issues. An issue response guide was attached which asked the public to prioritize previously identified issues and submit additional issues for consideration.

Based on the issue response guides and other public input received during preparation of the Owyhee Management Framework Plan (MFP), several major issues stand out. The proposed level of use for livestock, wildlife and wild horses and the resultant local and regional economic impacts from this allocation was the major issue identified. Most affected livestock operators felt that the overall reduction of 31 percent identified in the proposed action is unneccessary to achieve range improvement and only land treatment and other range development projects should be implemented to achieve range improvement. They feel there would be severe adverse social and economic impacts. On the other hand, some interest groups indicate that the proposed livestock reductions are justified and are necessary to attain satisfactory range, watershed and wildlife habitat improvement.

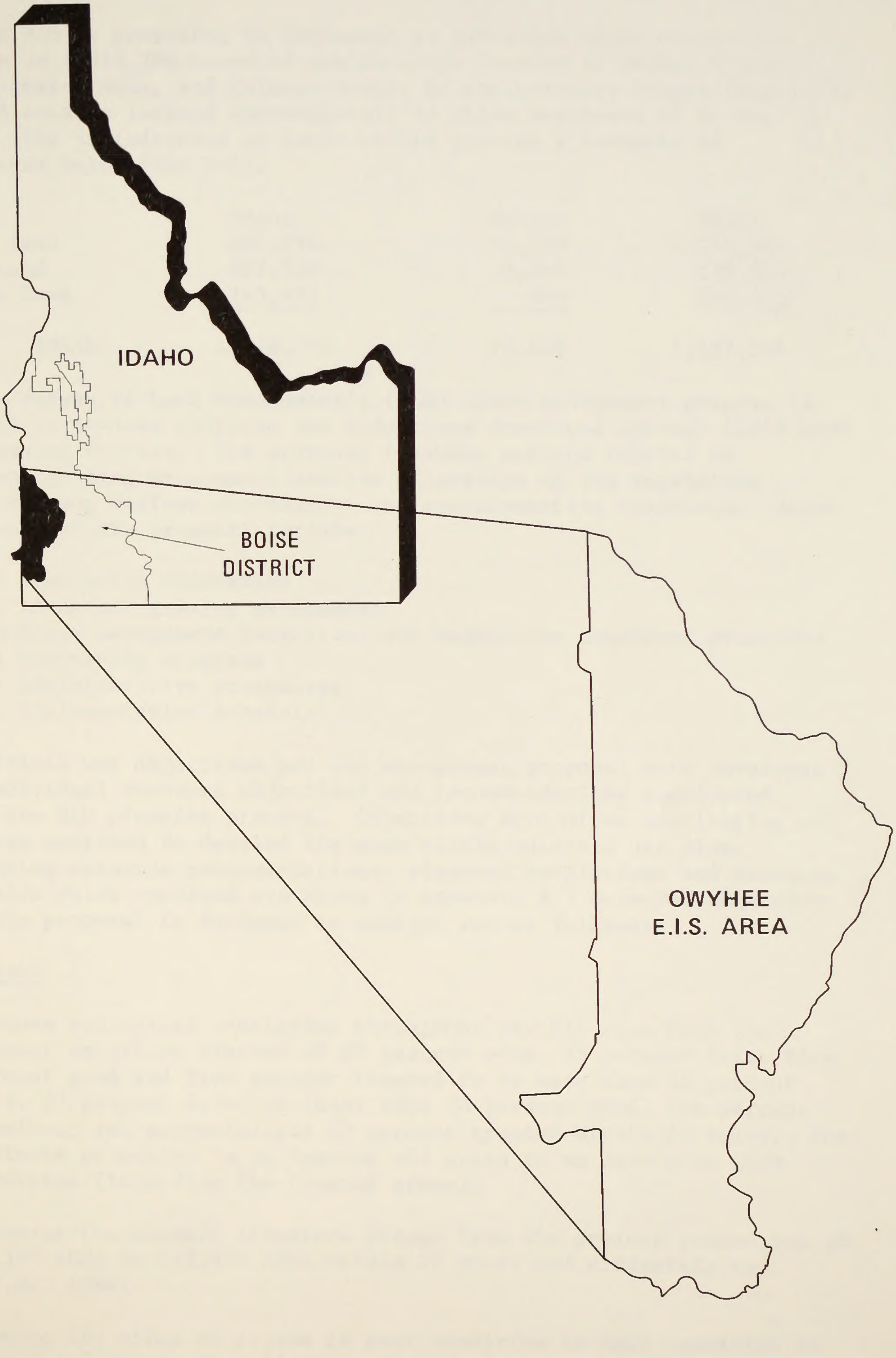
Another major issue identified is the exclusion or regulation of livestock grazing on riparian or stream areas. Many individuals and interest groups feel that exclusion of livestock is necessary to achieve satisfactory improvement. Others feel that satisfactory improvement can be achieved through proper livestock management practices (i.e. grazing systems, proper stocking rates, etc.). The livestock operators expressed concern over the loss of water and forage if stream areas were fenced to exclude livestock grazing.

The proposed action and alternatives are designed to allow these major issues to be addressed. Varying levels of livestock, wildlife and wild horse use, and subsequent vegetative allocations are proposed so an optimum mix can be determined. Similarly, various proposals for management of riparian habitat are addressed. Alternative 5, which maximizes livestock use, was developed with input from the Owyhee Cattlemen's Action Group. It addresses the environmental consequences of implementing grazing management without initial livestock reductions by intensifying efforts to increase forage production through project development and vegetative treatment practices.

The EIS will provide interdisciplinary analysis to allow the BLM to allocate vegetation in proper ratios for wildlife, wild horses, livestock, watershed protection, aesthetics and other consumptive and nonconsumptive uses. It will provide the decision maker information to select a management program from a range of alternatives to improve resource conditions while giving adequate consideration to social and economic impacts.

This statement is prepared in compliance with the National Environmental Policy Act and in specific response to litigation in U.S. District Court, for the District of Columbia, entitled Natural Resources Defense Council, Inc. et.al. v. Rogers C. B. Morton et.al. Case #1983-73.

MAP 1–1



CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The BLM is proposing to implement an intensive range management program on 1,014,296 acres of public lands located in Owyhee County southwestern Idaho, and Malheur County in southeastern Oregon (Map 1-1). The EIS area is located approximately 50 miles southwest of Boise, Idaho. The jurisdiction of lands within grazing allotments is summarized below (Map 2-1).

	Idaho	Oregon	Total
Public land	985,756	28,540	1,014,296
State land	117,529	9,084	126,613
Private land	245,491	824	246,315
TOTAL	1,348,776	38,448	1,387,224

The Bureau of Land Management's (BLM) range management program is designed to achieve multiple use objectives developed through BLM's Land Use Planning Process. The proposal includes actions related to livestock grazing management and the allocation of the vegetative resource among various consumptive and nonconsumptive resources. Major components of the proposal include:

(1) Vegetation allocation
(2) Livestock grazing management
(3) Range management facilities and vegetative treatment practices
(4) Monitoring programs
(5) Administrative procedures
(6) Implementation schedule

Multiple use objectives and the management proposal were developed from individual resource objectives and recommendations considered during the BLM planning process. Objectives were often conflicting and some were modified to develop the most viable multiple use plan. Conflicting resource recommendations, proposed resolutions and resource trade-offs which resulted are shown in Appendix A. Selected objectives which the proposal is designed to achieve are as follows:

Objectives

1. Improve ecological conditions throughout the EIS area from the present condition classes of 57 percent poor, 35 percent fair, five percent good and five percent treated to no more than 26 percent poor, 27 percent fair, at least than 20 percent good, two percent excellent and approximately 25 percent treated within 20 years. The ultimate objective is to improve all areas to no less than good condition (including the treated areas).

2. Increase the useable livestock forage from the present production of 78,300 AUMs to 142,800 AUMs within 20 years and ultimately to 191,200 AUMs.

3. Improve 113 miles of stream in poor condition to fair condition in five years and good condition in ten years. Improve 99 percent of all streams to fair or good condition in 20 years.

4. Provide adequate habitat on 413,400 acres of mule deer summer range to support 5,560 deer by 1990. Present estimated population is 1,880.

5. Provide adequate habitat on 394,000 acres of mule deer winter range to support 6,645 deer by 1990. Present estimated population is 2,905.

6. Provide adequate habitat on 427,500 acres of antelope range to support 860 antelope by 1990. Present estimated population is 725.

7. Provide adequate habitat on 7,800 acres of California bighorn sheep range to support 80 sheep by 1990. Present estimated population is 80.

8. Provide adequate habitat on 120,000 acres of wild horse range to support a healthy and viable wild horse population within a herd range of 118 to 178 head. The present inventoried number (February 1980) is 324 head.

9. Provide adequate habitat throughout the EIS area for upland game species.

10. Improve watershed conditions and water quality by upgrading vegetative conditions and increasing vegetative cover.

11. Limit disturbance to livestock by off-road vehicles by restricting ORV use on livestock spring range.

12. Provide for the protection and conservation of Threatened and Endangered plants and animals.

Vegetation Allocation

Vegetation for consumptive use would be allocated to livestock, wild horses, deer, antelope and bighorn sheep. Unallocated vegetation is available for watershed protection, aesthetics, small birds and animals and other nonconsumptive uses. The forage allocation is based on animal numbers, (determined through the bureau's planning process), animal forage requirements, dietary preference and plant maintenance requirements. Procedures are explained in Appendix C. Tables 2-1 and 2-2 summarize the vegetative allocation. Vegetative allocation by allotment is shown in Appendix Tables C-7 and C-8.

Sufficient vegetation (2,152 AUMs) is proposed to be allocated by allotment to provide the forage needs of antelope, deer and bighorn sheep populations present or expected within three to five years after the proposed action is fully implemented. The population management levels were determined through public input, including the Idaho Fish and Game Department, during the land use planning process. The proposed allocation for wild horses (2,329 AUMs) is based upon the proposed management level of animals (minimum 118 head and maximum 178 head). A total of 78,336 AUMs are being allocated for livestock use. The present active grazing preference is 113,122 AUMs. The past five-year average licensed active use has been 105,009 AUMs.

Table 2-1
Vegetative Production and Use
(Pounds of Vegetation/% of total annual production)

User	Existing Situation	Proposed Action	Alternative #1 No Livestock Grazing	Alternative #2 No Action	Alternative #3 Maximize Wild-life & Watershed Conditions	Alternative #4 60% Utilization Levels	Alternative #5 Maximum Live-stock use
Livestock	90,498,000/15%	62,669,000/10%	0/0	90,498,000/15%	45,206,000/7%	75,137,000/12%	90,498,000/15%
Deer	4,351,000/1%	8,633,000/1%	8,630,000/1%	4,351,000/1%	8,630,000/1%	8,633,000/1%	4,351,000/1%
Antelope	485,000/<1%	646,000/<1%	646,000/<1%	485,000/<1%	646,000/<1%	646,000/<1%	485,000/<1%
Bighorn Sheep	100,000/<1%	100,000/<1%	100/000/<1%	100,000/<1%	100,000/<1%	100,000/<1%	100,000/<1%
Wild horses	3,900,000/1%	2,136,000/<1%	4,056,000/1%	2,135,000/<1%	4,056,000/1%	2,136,000/<1%	2,136,000/<1%
Non Consumptive 1/	513,606,000/84%	538,756,000/88%	599,208,000/98%	515,370,000/84%	554,302,000/90%	526,288,000/86%	515,370,000/84%
Total Annual Production	612,940,000/100%	612,940,000/100%	612,940,000/100%	612,940,000/100%	612,940,000/100%	612,940,000/100%	612,940,000/100%

1/ Includes watershed protection, aesthetics, plant needs.

Table 2-2
Forage Consumption 1/

User	Existing Situation	Proposed Action	Alternative #1 No Live-stock Grazing	Alternative #2 No Action	Alternative #3 Maximize Wild-life & Watershed Conditions	Alternative #4 60% Utilization Levels	Alternative #5 Maximum Live-stock use
Livestock	105,009 5/	78,336	0	105,009 5/	56,507	93,921	113,122
Deer, Antelope, Bighorn Sheep	1,135	2,152	2,152	1,135	2,152	2,152	1,135
Wild Horses	4,225	2,329	4,431	2,329	4,431	2,329	2,329
TOTAL	110,369	82,817	6,583	108,473	63,090	98,402	116,586
Total Available Competitive AUM's	63,090 2/	82,817 3/	63,090 2/	63,090 2/	63,090 2/	98,402 4/	82,817 3/

1/ All figures are competitive livestock AUMs (Animal Unit Months) that would be consumed at implementation of the proposed action or alternatives.
2/ Competitive AUMs available at biological limit utilization level of key forage species.
3/ Competitive AUMs available at 50% utilization levels on Intensive Management allotments & biological limit utilization on other allotments. This available AUM level was chosen for Alterative 5 because grazing systems in the proposed action will be applied.
4/ Competitive AUMs available at 60% utilization levels on Intensive Management allotments & biological limit utilization levels on other allotments.
5/ This figure represents the five-year average licensed active use - Current active preference is 113,122 AUMs.

Additional forage which become available in the future would be allocated according to the following criteria:

1. Additional forage would be allocated to livestock until the livestock operator's total grazing preference has been satisfied.

2. After the preference has been satisfied, forage increases would be allocated proportionately to all consumptive uses. Proportionate increases would be based upon the current use or allocation at the time additional forage becomes available.

Overall, the active grazing preference would be reduced 31 percent (113,122 AUMs to 78,336 AUMs). Proposed livestock use of 78,336 AUMs would result from the following adjustments:

Level of Management	Proposed Allocation	% Change from present active preference	Public Land Acreage
Intensive Management	73,551	-32	959,277
Less Intensive Management	2,660	-35	32,441
Management in Association with Private Lands	2,125	-23	22,578

Some allotments have forage allocation increases proposed and some have decreases proposed, as follows:

	Number of Allotments	Number of AUMs increased or decreased	Range of adjustments per allotment (%)
Proposed Increases	29	+4,381	+1% to +313%
Proposed Decreases	82	-39,909	-1% to -93%

On allotments managed intensively, the vegetative allocation is based on 50 percent utilization levels of palatable plants. On allotments not intensively managed, the vegetative allocation is based on the biological limits of forage species. The biological limit is the level or degree of grazing that can be allowed without periodic rest treatments and still satisfy plant growth requirements. Utilization levels of current years production vary with vegetation type and season-of-use but are normally between 30 and 50 percent. Specific utilization levels are described in Appendix C.

If grazing systems are implemented on less intensive management areas in the future, allowable utilization levels would increase to 50 percent.

Adjustments in livestock use would be implemented within a three-year period according to the following schedule:

A. Allotments upon which management can be implemented immediately.

1. Adjustment is less than ten percent; implement grazing system; monitor for two years, and implement needed adjustment based on studies.

2. Adjustment of 10-24 percent; implement full adjustment and grazing system. Conduct actual use, utilization and trend studies annually. Adjust further as indicated by studies using a minimum of two year's data to support adjustments.

3. Adjustment is 24 percent or more; implement initial adjustment of 25 percent immediately. Actual use, utilization and trend data would be compiled annually to identify need for amount of further adjustment. Based upon studies, implement balance of adjustment at the beginning of the third grazing season, making total adjustment within three years.

B. Allotments presently managed under a grazing system.

1. Adjustment is less than ten percent; monitor for one year prior to adjustment.

2. Adjustment of 10-24 percent; implement total adjustment immediately. Continue actual use, utilization and trend studies annually. Adjust further as indicated by studies, using a minimum of two year's data to support adjustments.

3. Adjustment is 25 percent or more; implement adjustment of 25 percent immediately. Actual use, utilization and trend data would be compiled annually to identify need for further adjustment. Based upon studies, implement balance of adjustment at the beginning of the third grazing season, making total adjustment within three years.

C. The full adjustment would be made immediately on all allotments which would not be managed under a grazing system.

Livestock Grazing Management

Three levels of management are proposed on the Owyhee Study Area. Intensive management would be applied to 70 allotments (959,277 acres). Less intensive management would be applied to fifteen allotments (32,441 acres) and management in association with private lands would be applied to 58 allotments (22,578 acres).

Intensive management is proposed for allotments which contain high percentages of public land or high resource values. Allotment management plans incorporating specific grazing systems, levels of grazing use, season-of-use and range improvement projects would be prepared and implemented following completion of the EIS and Land Use Plan. The existing and proposed stocking rates, season-of-use, kind of livestock (which doesn't change from the present), and grazing systems by allotment are shown in Appendix Table C-8.

Proposed livestock turn out dates would be two to three weeks later than present ones. Turn out dates would correspond with plant growth stages (i.e., four to six inch leaf height of bluebunch wheatgrass, two to three inch leaf height of Idaho fescue, three to four inch leaf height of squirreltail and one inch leaf height of sandberg bluegrass on sheep ranges). Grazing use could be made two weeks earlier than these growth stages where old forage is present from the previous year rested or regrowth pastures.

Rest rotation, deferred rotation or seasonal grazing systems are proposed to achieve management objectives. Rest rotation grazing would be applied to portions of 35 allotments (44 percent of the intensive management area). This grazing system rests the range from grazing at suitable intervals dictated by the growth requirements of key forage plants. It is designed to counteract the effects of the selective grazing habits of livestock. The system allows desirable forage species to recover vigor, produce seed and establish new seedlings.

Rest rotation grazing systems were recommended on allotments which exhibit some or all of the following characteristics:

1. Rest during the growing season is needed to improve vigor and produce seed. Use of livestock to trample seed is an aid in rapid recovery.

2. Yearlong rest following rest during the growing season is needed for seedling establishment.

3. Substantial improvement in range condition is needed and attainable through grazing management.

4. Topography is not a limiting factor in constructing or developing range improvement projects.

5. Ecological site improvement on nearby areas with similar grazing management systems is satisfactory.

Deferred rotation grazing is proposed on portions of 44 allotments (41 percent of the area). This system delays grazing in succeeding years on a portion of range until a specific plant growth stage is reached. The entire range unit is used at sometime during the grazing system, two or more pastures are necessary. Grazing is rotated among all pastures during the grazing season; one pasture is normally deferred each year until after seed of the key forage plants is mature. Deferred rotation grazing systems which do not allow a pasture to be rested until seedripe, are proposed on ten of the 44 allotments. These systems are designed to allow sufficient plant regrowth following early spring grazing to maintain plant vigor and establish seedlings.

Season-long deferred rotation grazing systems were recommended on the basis of some or all of the following criteria:

1. Rest during the growing season is needed to improve vigor and produce seed. Use of livestock to trample seed is an aid in more rapid recovery of desireable species.

2. Size and shape of an allotment and topography may be limiting factors in project feasibility.

3. Topography may be a limiting factor in livestock movement.

Early spring/late spring deferred rotational use was recommended on some allotments based on all or part of the following criteria:

1. The desired stand is established and vigor improvement is needed (in the case of crested wheatgrass seedings).

2. Use to favor long season perennials and utilize early annuals (cheatgrass) and perennials (sandberg bluegrass) is desired.

3. The topography and climatic limitations constrain the season-of-use.

Seasonal grazing is proposed on portions of ten allotments (fifteen percent of the area). Under this system, grazing occurs on the same area and during the same period each year. Normally, use is made during early spring, after seed maturity of key species, or during the fall or winter.

Seasonal grazing was recommended for those allotments based on some or all of the following criteria:

1. Maintenance and improvement of range conditions is desired.

2. Past and current livestock use has been on a seasonal basis and range will improve at a satisfactory level when grazed at a moderate utilization level.

3. Topographic limitations constrain season-of-use.

4. Use is made after seed production or plant dormancy.

Several allotments use a combination of grazing systems. When seasonal grazing is combined with a rest or deferred rotation grazing system, generally only one pasture is grazed on a seasonal basis with the remainder of the allotment being placed under some form of rotation system. In several instances, deferred and rest rotation systems are used on a single allotment. Such combinations are suggested when a single system type will not fully meet allotment resource objectives.

In many instances the grazing systems or combinations of systems selected, are not ones which would cause the most rapid ecological site recovery rate. Systems selected, however, will create acceptable recovery rates. Individual systems were designed to satisfy vegetative requirements for improvement while considering factors such as size, physical limitations for stock movement and project development, and the overall needs of each ranch operator.

As shown below, nineteen existing allotments would be combined to allow implementation of grazing management systems. It is not economically feasible to split these individual allotments into pastures.

Existing Allotments	New Allotment
Alakli - Wildcat #0514 Rats Nest #0522 Elephant Butte #0513 (southern portion)	Squaw Creek
French John #0518 Shares Basin #0556	Shares Basin
Juniper Springs #0525 Pasture 4, Shares Basin #0521	Juniper Springs
North Castle #0553 Box T #0534	Box T
Ben Mills Flat #0549 Star Ranch Field #0550	Ben Mills Flat
Cow Creek Ind. #0562 Trout Creek Ind. #0563	Cow Creek
Hardiman Spring #0573 West Antelope #0574	West Antelope
Louse Creek #0580 Duck Creek - Wash Gulch #0581	Duck Creek
Louisa Creek #0601 West Antelope #0602	West Louisa

Less intensive management is proposed for fifteen allotments which contain large percentages of private or state lands, and on those allotments so small that the application of intensive management is not feasible. Specific grazing systems are not proposed for these allotments. The BLM would assist the State Land Department and the Soil Conservation Service (SCS) in development of grazing systems to improve these areas to good ecological site condition. The seasons-of-use and proposed stocking rates for these allotments are shown on Appendix Table C-8.

Management in association with private lands is proposed for 58 allotments. These allotments are predominantly private lands that contain small acreages of unfenced BLM land. Grazing use would be authorized at biological use limit levels. Livestock use could occur during any period of the year provided resource conditions were static or improving.

Additional Management Measures

To improve riparian habitat, 64 miles of stream would be fenced and special grazing management applied (Map 2-2). This management could consist of periodic exclusion of livestock, limited seasons of livestock use, light utilization levels or other practices required to ensure improvement in riparian habitat condition (Table 2-3). The distance between the stream and fence would vary. Fencing may occur adjacent to the stream, along canyon rims, or, in cases where the fenced area is incorporated into a grazing system, a mile or more from the stream. Periodic water gaps for livestock use would be provided.

Table 2-3
Proposed Stream Fencing

Stream	Allotment	Miles
Louse Creek	580	1
Jordan Creek	570	.25
Boulder Creek	595	1
	600	.8
S. Mtn. Creek	600	2.2
N. Fork Owyhee	520	1
	501	2
	539	1
	546	2
	500	2.5
Current Creek	520	1.25
	548	4.6
	599	2.4
Noon Creek	520	1.7
Middle Fork Owyhee	539	6
Red Canyon Creek	539	17.3
	540	3.7
	539	1.4
Deep creek	548	5
	599	1
Juniper Creek	561	.5
Corral Creek	561	5.6
TOTAL		64 miles

These streams are receiving high levels of grazing use, are in poor condition and have a high fisheries production potential. On an additional 86 miles of stream, log structures would be placed along streambanks to discourage livestock trailing along stream bottoms. The 86 miles are those areas identified on Map 2-2 for log structures plus the stream mileage identified to be fenced under alternative 3. These areas have a moderate to high degree of grazing conflict but a lower priority for being fenced. Cut juniper trees of at least ten feet in length with limbs, would be laid along the streambank about five feet apart or the width of the tree. The butt end of the tree would be cabled down and secured with a post. The top end of the tree would extend slightly into the stream and be angled toward the downstream flow.

Where proposed livestock management (grazing systems and season-of-use) does not alleviate heavy grazing of important sage grouse brood habitats (meadows), these areas would be fenced and special grazing management applied. Management would consist of delaying grazing until after the brooding season and limiting use to improve condition.

Livestock would be salted away from all streams and meadows to reduce concentrations on riparian and meadow vegetation.

In order to reduce disturbance to livestock, off-road vehicle use would not be allowed on early spring livestock ranges from April 1 through June 15, or until the livestock are moved off the spring use area.

Livestock use would be excluded from developed recreation sites.

Implementation and Maintenance of Range Improvements and Land Treatments

Implementation of the proposal would require development of approximately 81 springs, 90 reservoirs, 24 miles of pipeline, 100 watering troughs, and 153 miles of fence. Thirteen miles of existing fence would be removed. The potential exists to control sagebrush and juniper on approximately 239,000 acres, of which 67,000 acres would be revegetated with desirable plants (Map 2-3, inside back cover). Site specific design criteria (discussed later) could limit the total area treated to somewhat less than these acreages. Proposed development by allotment is shown in Appendix D. Project development would cost approximately $4,000,000 (Table 2-4).

Proposed developments and existing project development would be periodically maintained (Table 2-4). Existing project development consists of 185 springs, 201 reservoirs, 633 miles of fence, sixteen miles of pipeline, 10,000 acres of brush control and 31,800 acres of seeding (Map 2-4, inside back cover).

Project Development and Design Criteria

Spring Development (Map 2-3) - Water would be collected at the spring source by installing perforated pipe and collection boxes and piped approximately 100 feet to water troughs for livestock use. Live water would be provided for wildlife at the spring source or inside a fenced overflow area. Approximately 90 percent of the spring developments would be fenced. Springs would not be fenced where it is physically impossible due to steep or rocky terrain. Where necessary to maintain water at the spring source, float valves would be installed to prevent constant drainage of the spring. Existing spring developments would be modified to comply with these design specifications.

Reservoir Development (Map 2-3) - Dams would be constructed along ephemeral drainages to impound spring runoff water for livestock and wildlife. Water storage capacity would range from one to two acre-feet. Fill material would come from the impoundment area, or if needed, from nearby sites. Approximately 80 percent of the reservoirs would be fenced and water piped to troughs for livestock use. Small reservoirs and reservoirs constructed on flat terrain would not be fenced because there is not enough slope to pipe water out. Reservoirs built in association with seep areas woull be constructed below the site to prevent loss of the riparian zone.

Pipeline Development (Map 2-3) - Pipelines would be developed to carry water from existing wells or springs to areas with inadequate

Table 2-4

Project Development and Maintenance Cost

Project	Proposed Units	Unit Cost	Total Cost	Existing Projects	Maint-enance Respon-sibility	Annual Maint. Cost/Unit	Annual Maint. Cost (Existing & Proposed)
Pasture Fence	153 miles	$2,300	$351,900	633 miles	Permittee	$ 70	$ 55,000
Exclosure Fence	64 miles	$2,900	$185,600	12 miles	BLM	$ 90	$ 5,760
Log Structures	86 miles	$1,000	$ 86,000	0	BLM	Unknown	Unknown
Pipelines	24 miles	$4,500	$108,000	16 miles	Permittee 1/	$180	$ 7,200
Well	0	0	0	5	BLM	Unknown	Unknown
Spring	81	$1,600	$129,600	185	Permittee	$ 50	13,300
Redesign existing Spring	120	$ 500	$ 60,000				
Reservoir	90	$7,800	$702,000	201	BLM	$ 80	23,300
Juniper Chaining	2,000 acres	$120	$240,000	500 acres	BLM	Unknown	Unknown
Other Sagebrush & Juniper Control	170,000 acres	$6 2/	$1,020,000	9,500 acres	BLM	Unknown	Unknown
Brush Control & Seeding	67,000 acres	$18 3/	$1,206,000	31,800 acres	BLM	Uknwon	Unknown
TOTAL COST			$4,091,100				$104,560

1/ BLM will maintain pumps and generators and will fill storage tanks prior to the grazing season. Associated costs, however, will be born by the permittees.
2/ Cost represents the average cost of burning ($4/acre) and spraying ($8/acre).
3/ Cost represents the average cost of brush control ($6/acre) plus seeding cost ($12/acre).

water. Where pipelines utilize a spring source, the system would be designed to provide water for wildlife at the spring source.

Construction would consist of burying a 1.25 to two inch plastic pipe approximately twenty inches below the ground. Pipelines are installed in two ways. On deep soils, a trenching machine is used to dig the trench, lay the pipe, and cover it with soil in one pass. The soil is mounded on top of the trench to minimize the depression after settling. The second method is used when soil depth is limiting. A trench is opened, the pipe is laid, and the soil is mounded on top in three separate steps. Because of the limiting soil depth, topsoil is borrowed from an area approximately ten feet on either side of the trench. The trench opening averages two feet for each method. Water would be provided approximately every mile along the pipeline for livestock and wildlife. To provide water for wildlife that become dependent upon the new sources, pipelines would remain charged with water during the dry season, whether or not livestock are present in the allotment.

Fence Construction (Map 2-3) - Fences would be constructed to establish allotment boundaries, divide allotments into pastures, and where necessary, to exclude livestock from springs, reservoirs and selected streams. Fences would be constructed to control livestock without restricting the movement of deer and antelope. Existing management fences that create wildlife movement problems would be modified. Design specifications are shown in Appendix E. Fence posts would be a solid nonreflective color to minimize visual impacts. Proposed fence lines would not be bladed or scraped. Gates or cattleguards would be installed where fences cross existing roads.

Fences would parallel horse movement patterns wherever possible. All gates within a herd area would be left open when not needed for control of livestock grazing.

Land Treatments

Sagebrush and juniper would be reduced on 172,000 acres by chaining, burning, or chemical treatment. An additional 67,000 acres would receive brush control and be seeded with a grass/forb/shrub mixture. The area proposed for treatment consists of approximately 50,000 acres of juniper. There are approximately 230,000 acres of juniper in the EIS area. Approximately 90 percent of the acreage identified for treatment falls within the "good" or "fair" categories, according to the system derived by the Boise District for use in the EIS area (Appendix Table H-2). The remaining area (24,000 acres) falls within the "poor" rating category because of low precipitation. These poor areas are located below the 3,500 foot elevation zone and would be treated only after development of test plots that demonstrate successful response. Sites in immediate need of treatment to protect critical watershed values could be treated without previous testing.

The specific acreage by treatment method (i.e. chaining, burning or chemical treatment) cannot be identified. Areas which could be treated by burning now, may be closed stands with no understory or fine fuel in ten to fifteen years. These areas would have to be treated by chaining or chemicals. On the other hand, areas which do not have enough understory to carry a fire now, may have enough fine fuel to burn in five or ten years as a result of the change in grazing management. While now chemicals or mechanical treatment may be the only option open, burning may be the desired method in ten years. As new chemicals are approved for rangeland use or present chemicals are restricted, the type of treatment method would change.

Acreage for potential land treatment was identified by the following criteria:

1. Canopy cover of the target species is greater than twenty percent.
2. Present ecological condition is poor or fair.
3. Soils are loamy.
4. Slopes are less than 50 percent.

After potential sites were identified, these restrictions were applied and further limited the proposed treatments:

1. No chaining or seeding would be attempted on slopes over twenty percent.
2. No spraying or chaining would be done in Class I or II VRM areas or in areas under wilderness review.
3. No sagebrush would be sprayed on deer summer ranges or sage grouse brood or nesting areas.
4. No sagebrush would be burned in areas with green rabbitbrush.
5. No juniper burning would be attempted in the absence of understory adequate to carry a fire.
6. No chemical would be used on public lands unless approved by the Department of Interior.
7. Only aerial seeding application would be used in Class I or II VRM areas or in areas under wilderness review.
8. Seeding would be attempted on sites below 3,500 feet elevation only after success was demonstrated on test plots.

Burning in sagebrush types would normally occur during October or November and after sufficient rainfall had been received to limit damage to desirable vegetation. In dense juniper stands, burning would be allowed during the summer/fall period. Reduction of sagebrush and juniper by chaining would be accomplished by dragging a large chain along the ground between two caterpiller tractors.

Chemical treatment would consist of applying 2-4-D during the spring to control sagebrush. Tordon, upon approval, would be used during the summer and fall to control juniper. Prior to application of chemicals, BLM would ensure compliance with the Federal Working Group on Pesticide Mangement regulations. They must approve any application over 600 acres in size or any size application of chemicals on the restricted list (picloram, an ingredient in Tordon is on the restricted list; 2-4-D is not on the restricted list). By cooperative agreement, approval or concurrence would be obtained from the Idaho Department of Fish and Game prior to application of any chemicals.

All land treatment projects would be limited in size, where necessary, by the cover requirement of wildlife on specific wildlife ranges.

On sage grouse brood rearing areas, the sagebrush canopy cover would not be reduced below ten percent.

On sage grouse nesting and wintering areas, the sagebrush canopy cover would not be reduced below twenty percent.

On general antelope ranges, the sagebrush would not be reduced below five percent canopy cover. Winter ranges and spring fawning areas would not be treated unless benefits to antelope would result.

Treatments on critical mule deer winter range would not alter existing vegetation below a 75/25 forage-to-cover ratio. Seedings in these areas would contain early maturing grasses (Siberian wheatgrass and Russian wildrye) to improve deer nutrition during the early spring. Seedings would not exceed one-fourth mile in width.

On mule deer summer range, treatments would be designed to achieve a 60/40 forage-to-cover ratio. Treatment areas would not exceed one-fourth mile in width. Optimum design would retain continuous zones of interconnecting cover (600-1,200 feet wide) and associated cover patches (six to 26 acres). Cover areas would use existing vegetative cover, rims, canyons and riparian zones.

A buffer zone along all creeks, intermittent and perennial, where erosion may occur would be left undisturbed to protect riparian zones and fisheries habitat. Spraying would not occur with one-fourth mile of riparian zones. Projects would be designed with irregular control lines, feathered edges and along natural contours. On sites treated by mechanical means, drainages and occasional brush islands would be left untreated. All vegetative manipulation practices would be scheduled to allow ample protection for the desirable native or introduced species to become established (normally two growing seasons).

Standard Operating Procedures - The following procedures would be followed in the construction of all management facilities and vegetative treatments:

1. Roads or trails to new construction or project sites would not be constructed. Off-road vehicles or existing roads and trails would be utilized. Wherever possible, roads would not be built into any proposed range improvement site within or adjacent to bighorn sheep habitat.

2. Cultural and Endangered species clearances would be conducted on all project sites. In the event values may be damaged, the project would be abandoned, relocated or the cultural site salvaged if the project must be completed.

3. Project clearances for Threatened and Endangered species would cover areas adjacent to project sites to ensure any anticipated increase in livestock use would not significantly affect any Threatened and Endangered species populations.

4. In areas of high cultural resource site density, any increases above present forage utilization levels would be preceeded by a cultural resource inventory. Actions which would significantly impact cultural resource values would not be allowed.

5. In cases where archaeological clearances indicate possible buried sites, project development would be supervised by an archaeologist.

6. All wilderness values would be protected in lands under wilderness review.

   Implementation of any part of the proposed action in Wilderness Study Areas and in other lands still involved in the wilderness review process would be deferred or modified if the action would impair an area's suitability for preservation as wilderness. If such an area were designated wilderness, the deferment would be permanent; if not, the proposed action would ultimately be completely implemented, subject to resource constraints other than wilderness.

   Deferment or modification of elements of the proposed action would affect actions that would cause impairment of wilderness resources in the forms of the appearance of substantially noticeable man-made features on natural landscapes; impacts on primitive recreation resources such as scenic values, fish and wildlife; and impacts on natural processes and condition of natural resources such as vegetation and soil.

   The "nonimpairment" standard concerning lands under wilderness review, as defined in the Interim Management Policy (USDI 1979), allows grazing uses as existed on October 21, 1976, and some new temporary uses and permanent improvements if the new actions meet two tests. First, by the time the Secretary of the Interior is scheduled to send his recommendations to the President, the new impacts must be reclaimed to the point of being substantially unnoticeable in the overall area. Second, the area's wilderness values must not have been degraded so far, compared with the area's values for other purposes, as to significantly constrain the Secretary's recommendation with respect to the area's suitability or nonsuitability for preservation as wilderness. Wilderness values include naturalness, outstanding opportunities for solitude and primitive and unconfined recreation (encompassing fish, wildlife and watershed resources), and ecological, geological or other features of scientific, educational, scenic or historical value.

In general, the nonimpairment standard allows the following range activities:

- Changes in number, kind of livestock and period of use, if declining condition or trend of vegetation and soil is avoided.

- New grazing systems as long as supporting activities and necessary improvements meet the tests of nonimpairment.

- Use of existing range improvements. Maintenance of these improvements is allowed, using existing vehicle routes and authorized temporary access routes if nonimpairing. New salting locations and supplemental feeding are allowed under the same access provision.

- New permanent range improvements such as fences, spring developments and small reservoirs, if nonimpairing and if they would not require motorized access should the area be designated as wilderness. Some improvements, such as fencing streams to protect fisheries and watershed resources, may enhance wilderness values.

- Prescribed burning where necessary to maintain fire-dependent natural ecosystems; seeding by hand or aerial methods only to restore natural vegetation.

Special care would be taken to preserve intact the pristine character of study areas where very few or no imprints of man are present.

Implementation of specific projects would be judged on an individual basis through the environmental assessment process to determine whether such projects meet the tests of nonimpairment. Guidelines as stipulated in the Interim Management Policy would be followed. Cumulative effects of individual projects and the effects of proposed activities on study areas that are essentially pristine in character would be considered in assessing potential impairment.

7. All actions would be designed to address BLM Visual Resource Management criteria. Project developments would be designed to minimize adverse visual impacts.

8. Wildlife escape devices would be installed wherever water troughs and tanks create a hazard to wildlife.

9. In critical wildlife habitats, (winter ranges, raptor nest sites, strutting grounds, etc.) construction work on range improvements would be scheduled to avoid or minimize disturbance to wildlife.

10. Areas disturbed during project construction would be reseeded with a mixture of grasses, forbs and shrubs.

Monitoring Programs

Studies and evaluation procedures would be initiated in accordance with BLM Manual, Section 4412, to determine if the MFP and specific allotment objectives are being met. These studies would include compilation of actual use, range trend, range/watershed condition, watershed quality, utilization, weather data, carrying capacity, and wildlife habitat conditions. The study site would be selected and read cooperatively with livestock operators and other interested agencies where possible. Where specific objectives are not met, adjustments in season-of-use, livestock numbers (including removal) or grazing system would be made depending on the indicated need.

Utilization studies would be conducted during the grazing season on use pastures. When utilization reaches desired levels, livestock would be moved to the next pasture scheduled for grazing. If utilization limits are reached in all pastures scheduled for use prior to the end of the scheduled grazing season, livestock would be removed from the allotment.

Utilization studies would be conducted using the key forage plant method (BLM Manual 4410). This method establishes key vegetative species and key areas that would be monitored for utilization. Key areas would be selected to represent the majority of the grazing area within an allotment or pasture. Key areas would not be selected along stream bottoms or ridge tops. Key species to be monitored would include bitterbrush, Idaho fescue, and bluebunch wheatgrass. It is anticipated that utilization studies would require additional manpower needs of 30 work-months (five or six people during the summer months).

Administrative Procedures

BLM would issue permits in accordance with the grazing regulations (43 CFR 4100) for grazing livestock on each allotment within the framework of the grazing system. The grazing permit would specify the grazing area, livestock numbers and kind, season-of-use and AUMs which the permittee may utilize. BLM employees would make routine allotment inspections to ensure that livestock numbers and time of grazing for each pasture comply with that authorized by the permit. Trailing permits would be required for livestock, if needed. BLM would control livestock trespass in accordance with the grazing regulations. Livestock would be eartagged if necessary to aid in management and trespass control. Land exchanges would be encouraged on intermingled lands that would benefit grazing administration.

Implementation Schedule

Adjustments in livestock use would be implemented within a three-year period as previously described in the forage allocation section.

It is anticipated that water development and fencing would be completed within five years to allow all grazing systems to be functional by the 1986 grazing season.

Land treatment practices (brush control and seeding) would be completed and available for use within fifteen years. Approximately one-third of the treatment acreage would be completed during each of the three five-year periods, following completion of the EIS.

Monitoring programs for vegetation, water quality, wildlife, fisheries and wild horses would be developed and implemented prior to adjusting present management.

During the first five-year period approximately seventeen work-months would be required per year for archaeological clearances. During the second and third five-year periods approximately thirteen work-months would be required per year.

Project Implementation would occur as follows:

Project	First 5-year Period Amount/Cost	Second 5-year Period Amount/Cost	Third 5-year Period Amount/Cost
Fencing, Log Structures and water development	All/$1,600,000	0	0
Land Treatment	1/3 /$800,000	1/3 /$800,000	1/3 /$800,000
Total Cost	$2,400,000	$800,000	$800,000

ALTERNATIVE 1
No Livestock Grazing

All livestock grazing on public lands would be eliminated. All existing grazing privileges and cooperative agreements for range improvements would be cancelled. Salvage rights would be granted to range users who had contributed to range management facilities. Use on intermingled state and private lands would be possible if the landowner or lease holder of the state tract were able to fence his holdings away from public lands. Forage on public lands would be reserved for wildlife and wild horses (Table 2-5).

Table 2-5
Alternative 1 - Proposed Use

	Proposed Use 1/	Existing Use
Livestock	0	105,009 2/
Wildlife	2,152	1,135
Wild Horses	4,431	4,225
	6,583	110,369

1/ Competitive livestock AUMs.
2/ Five-year average licensed use.

Wild horse numbers in areas occupied by horses at the passage of the Wild Horse and Burro Act would be allowed to increase to properly utilize forage remaining after wildlife populations reach reasonable management numbers as described in the proposed action (Table 2-6).

Table 2-6
Wild Horse Allocation

Allotment	Number of Horses	Competitive AUM Allocation
508	84	1107
516	60	790
517	84	1092
521	48	624
522	26	344
556	36	474
	338	4431

No management facilities for livestock would be constructed. Facilities for wildlife, watershed and wild horse management would continue under existing programs. There would be 550 miles of existing pasture fence removed. Boundary fences around the EIS area and wild horse areas would be maintained. The cost of fence removal would be approximately $650,000.

ALTERNATIVE 2
No Action

The current livestock grazing program would be continued. Grazing systems currently in operation would continue. The active grazing preference would remain at 113,122 AUMs. This alternative assumes that the average annual licensed use for the last five years (105,009 AUMs) would continue at this level (Table 2-7).

Table 2-7
Alternative 2 - Proposed Use

	Proposed Use	Existing Use
Livestock	105,009 1/	105,009 1/
Wildlife	1,135	1,135
Wild Horses	2,329	4,225
	108,473	110,369

1/ Five-year average licensed active use.

Existing seasons-of-use, grazing systems, and level of livestock use are shown by allotment on Appendix Table C-8. No specific forage allocation is made for wild horses or wildlife in the present forage allocations. Wild horse numbers would be managed at levels described in the proposed action.

No additional project development or land treatment projects for livestock grazing would occur. Project development for other resource activities would continue under present programs.

ALTERNATIVE 3
Maximize Wildlife and Watershed Condition

This alternative proposes to implement grazing systems on intensive management allotments with stocking rates based on the biological limits of forage plants instead of the 50 percent utilization levels described in the proposed action. This would reduce utilization levels on key forage species to 30-40 percent on most areas. Stocking rates on less intensive areas and areas managed in association with private lands would also be based on biological limits. Wild horse numbers would be managed at maximum levels based on space requirements (338 head; see Alternative 1). This alternative would have the following forage allocation:

Competitive Livestock AUMs

	Proposed Use	Existing Use
Wildlife	2,152 AUMs	1,135 AUMs
Wild Horses	4,431 AUMs	4,225 AUMs
Livestock	56,507 AUMS	105,009 AUMs 1/
TOTAL	63,090 AUMs	110,069 AUMs

1/ Five-year average active licensed use.

This alternative proposes season-of-use dates that would maximize vegetative response and minimize conflicts with wildlife on critical deer winter ranges. The turn out dates described in the proposed action are approximately two weeks to one month later on the following 45 allotments.

450	513	541	556	579	590	603	592
502	516	546	557	580	593	520	594
503	517	551	562	581	597	544	
506	521	552	565	585	600	561	
508	526	553	572	588	601	576	
509	540	554	574	589	602	591	

These late turn out dates correspond to the plant development stage at which damage from livestock grazing is reduced. The following 41 allotments contain critical deer winter range. The date by which livestock would be removed was adjusted to September 1. The season-of-use and forage allocation by allotment is shown on Appendix Table C-10.

501	508	519	533	554	572	597	576	598
503	509	525	536	556	579	600	591	
505	515	529	539	557	588	510	592	
506	516	530	541	565	593	544	594	
507	518	531	542	569	595	559	596	

All water development projects and pasture fences including design specifications and standard operating procedures described for the proposed action would be implemented. Spraying, burning, chemical treatment and seeding projects would not be implemented. This alternative would assess the degree of range recovery anticipated without treatment projects.

In addition to the 64 miles of stream identified in the proposed action for fencing with special riparian management practices, this alternative proposes to fence an additional 49 miles as identified on Table 2-8 and Map 2-2.

Table 2-8
Alternative 3 - Stream Fencing

Stream	Allotment	Miles
Noon Creek	501	1.5
Juniper Creek	501	3.0
Cabin Creek	501	2.5
Corral Creek	501	1.25
Josephine Creek	502	3.2
Boulder Creek	503	1.0
Flint Creek	503	.25
Cow Creek	506	1.0
Reynolds Creek	508	3.25
	517	2.5
Little McBride Creek	515	1.4
McBride Creek	525	1.4
	565	1.6
N. Fork Castle Creek	533	.5
	541	4.5
Meadow Creek	533	1.7
	534	1.5
Squaw Creek	556	2.1
Trout Creek	560	1.3
	562	1.5
Scotch Bob Creek	569	3.0
E. Fork Sinker Creek	569	1.0
N. Fork Sinker Creek	579	2.1
Rose Creek	587	.3
Combination Creek	595	4.25
Succor Creek	478	1.0
Subtotal		49 miles
Plus streams identified for fencing in the proposed action.		64 miles
TOTAL MILES		113 miles

On an additional 37 miles of stream (Map 2-2), log structures would be placed along streambanks to discourage livestock trailing along stream bottoms.

Implementation cost of this alternative would be approximately $1,700,000 (Table 2-9). Project implementation would occur in the same sequence described in the proposed action. All project development work would be completed within the first five years.

Table 2-9
Project Development and Maintenance Cost - Alternative 3

Project	Proposed Units	Unit Cost	Total Cost	Existing Projects	Maintenance Responsibility	Annual Maint. Cost/Unit	Annual Maint. Cost (Existing & Proposed)
Pasture Fence	153 miles	$2,300	$351,900	633 miles	Permittee	$ 70	$ 55,000
Exclosure Fence	113 miles	$2,900	$327,700	12 miles	BLM	$ 90	$ 11,250
Log Structures	37 miles	$1,000	$ 37,000	0	BLM	Unknown	Unknown
Pipelines	24 miles	$4,500	$108,000	16 miles	Permittee 1/	$180	$ 7,200
Well	0	0	0	5	BLM	Unknown	Unknown
Spring	81	$1,600	$129,600	185	Permittee	$ 50	13,300
Redesign Existing Spring	120	$ 500	$ 60,000				
Reservoir	90	$7,800	$702,000	201	BLM	$ 80	23,300
Juniper Chaining	0	0	0	501 acres	BLM	Unknown	Unknown
Other Sagebrush & Juniper Control	0	0	0	9,500 acres	BLM	Unknown	Unknown
Brush Control & Seeding	0	0	0	31,800 acres	BLM	Uknwon	Unknown
TOTAL COST			$1,716,200				$110,050

1/ BLM would maintain pumps and generators and would fill storage tanks prior to the grazing season. Associated costs, however, would be carried by the permittees.

ALTERNATIVE 4
Sixty Percent Utilization

Grazing management systems described in the proposed action would be implemented with stocking rates based on 60 percent utilization levels of key forage species in place of 50 percent utilization levels. As in the proposed action, stocking rates on less intensive areas and areas managed in association with private lands would be based on forage species biological limits. Wild horses and wildlife would be managed at levels described in the proposed action. The forage allocation under this alternative is:

	Proposed Use	Existing Use
Wildlife	2,152 AUMs	1,135 AUMs
Wild Horses	2,329 AUMs	4,225 AUMs
Livestock	93,921 AUMs	105,009 AUMs 1/
TOTAL	98,402 AUMs	110,369 AUMs

1/ Five-year average licensed active use.

Land treatment practices and livestock management facilities would be developed as described in the proposed action. The monitoring program and administrative procedures described in the proposed action would be implemented.

Under this alternative, emphasis on protective management of streams would not occur. Streams would not be fenced or incorporated into a special grazing system designed specifically for riparian habitat protection. On 144 miles of stream, log structures would be placed along the streambank to discourage livestock trailing along stream bottoms. The area identified for log structures would be all of the area proposed for fencing and log structures on Map 2-2.

This alternative was designed to allow an assessment of the degree of range improvement that could be expected if livestock, wildlife and wild horses are allocated forage so that utilization levels of key forage species would be approximately 60 percent. This would allow grazing systems to be implemented with 20 percent more livestock, thereby reducing the adverse economic impacts to livestock operators.

Implementation cost of this alternative would be approximately $4,000,000 (Table 2-10). Project implementation would occur in the same sequence and during the same time periods as described in the proposed action.

Table 2-10
Project Development and Maintenance Cost - Alternative 4

Project	Proposed Units	Unit Cost	Total Cost	Existing Projects	Maintenance Responsibility	Annual Maint. Cost/Unit	Annual Maint. Cost (Existing & Proposed)
Pasture Fence	153 miles	$2,300	$351,900	633 miles	Permittee	$ 70	$ 55,000
Exclosure Fence	0	0	0	12 miles	BLM	$ 90	$ 1,080
Log Structures	144 miles	$1,000	$144,000	0	BLM	Unknown	Unknown
Pipelines	24 miles	$4,500	$108,000	16 miles	Permittee1/	$180	$ 7,200
Well	0	0	0	5	BLM	Unknown	Unknown
Spring	81	$1,600	$129,600	185	Permittee	$ 50	$ 13,300
Redesign Existing Spring	120	$ 500	$ 60,000				
Reservoir	90	$7,800	$702,000	201	BLM	$ 80	$ 23,300
Juniper Chaining	2,000 acres	$ 120	$240,000	500 acres	BLM	Unknown	Unknown
Other Sagebrush & Juniper Control	170,000 acres	$62/	$1,020,000	9,500 acres	BLM	Unknown	Unknown
Brush Control & Seeding	67,000 acres	$183/	$1,206,000	31,800 acres	BLM	Uknwon	Unknown
TOTAL COST			$3,961,500				$ 99,880

1/ BLM would maintain pumps and generators and would fill storage tanks prior to the grazing season. Associated costs, however, would be born by the permittees.
2/ Cost represents the average cost of burning ($4/acre) and spraying ($8/acre).
3/ Cost represents the average cost of brush control ($6/acre) plus seeding cost ($12/acre).

ALTERNATIVE 5
Maximum Livestock Use

This alternative proposes to implement livestock grazing management without changing existing AUM levels or seasons-of-use. Livestock use would not be limited to any specific utilization levels. Use up to the present active grazing preference of 113,122 AUMs would be allowed. This is shown by allotment in Appendix Table C-12. The grazing systems, water develoepment projects and pasture fences identified in the proposed action would be developed. Standard operating procedures described in the proposed action would be followed. The administrative procedures and monitoring program described in the proposed action would be implemented.

Under this alternative, maximum feasible acreages of land treatment is proposed. Sagebrush and juniper would be controlled through burning, spraying or chaining on a maximum of 154,000 acres; an additional 198,000 acres would be seeded and receive brush control (Map 2-5). These range treatment projects would be designed to maximize livestock forage production. They would not be designed for multiple use management. All size limitations and species limitations would be designed to maximize livestock forage production. The proposed acreage to be treated by allotment is shown on Appendix Table D-1. The acreage figures represent the total acres that are suitable for treatment within respective allotments based on the following criteria:

Sagebrush and Juniper Control

1. Poor or fair condition class
2. Loamy soils; no vegetative type restrictions
3. No slope restrictions

Seeding

1. Loamy soils; no vegetative type restrictions
2. Thirty-five percent or less slope

Livestock reductions would be taken during land treatment to ensure that adequate rest is provided for vegetative recovery or estalishment.

Streams would not be fenced and log structures would not be constructed to discourage livestock trailing along stream bottoms.

Wild horses and wildlife would be managed at levels described in the proposed action. Habitat needs are recognized for these animals. However, specific forage allocations are not made.

This alternative would cost approximately $6,000,000 to implement (Table 2-11). Project implementation would occur in the same sequence and during the same time period described for the proposed action.

Table 2-11
Project Development and Maintenance Cost - Alternative 5

Project	Proposed Units	Unit Cost	Total Cost	Existing Projects	Maintenance Responsibility	Annual Maint. Cost/Unit	Annual Maint. Cost (Existing & Proposed)
Pasture Fence	153 miles	$2,300	$351,900	633 miles	Permittee	$ 70	$ 55,000
Exclosure Fence	0	0	0	12 miles	BLM	$ 90	$ 1,080
Pipelines	24 miles	$4,500	$108,000	16 miles	Permittee 1/	$180	$ 7,200
Well	0	0	0	5	BLM	Unknown	Unknown
Spring	81	$1,600	$129,600	185	Permittee	$ 50	$ 13,300
Redesign Existing Spring	120	$ 500	$ 60,000				
Reservoir	90	$7,800	$702,000	201	BLM	$ 80	$ 23,300
Juniper Chaining	2,000 acres	$ 120	$240,000	500 acres	BLM	Unknown	Unknown
Other Sagebrush & Juniper Control	170,000 acres	$6 2/	$912,000	9,500 acres	BLM	Unknown	Unknown
Brush Control & Seeding	67,000 acres	$18 3/	$3,564,000	31,800 acres	BLM	Uknwon	Unknown
TOTAL COST			$6,067,500				$ 99,880

1/ BLM would maintain pumps and generators and would fill storage tanks prior to the grazing season. Associated costs, however, would be born by the permittees.
2/ Cost represents the average cost of burning ($4/acre) and spraying ($8/acre).
3/ Cost represents the average cost of brush control ($6/acre) plus seeding cost ($12/acre).

COMPARATIVE ANALYSIS OF IMPACTS

Based on the information and analysis presented in Chapters 3 and 4, a comparative analysis of the beneficial and adverse impacts of the proposed action and all alternatives is presented in Table 2-12.

The proposed action would decrease forage competition between wildlife, wild horses and livestock. Conditions on native ranges would improve on most allotments. Soil and watershed conditions would improve. Wildlife habitat would improve and populations would increase. Livestock use would be reduced initially, but would be above present use levels in 20 yeras, primarily as a result of increased forage production on land treatment areas.

Alternative 1, no livestock grazing, would produce variable vegetative responses. Low productive sites and sites in poor ecological condition, which are predominate in the EIS area, would show little improvement. Sites in high fair or good ecological condition and those sites in high precipitation zones would show greater improvement. Wildlife habitat conditions improvement would be similar to range condition improvement. Riparian and stream areas would show more improvement under this alternative than any other management proposal. Livestock operators would experience maximum adverse economic impacts.

Alternative 2, no action, would result in the continuation of present trends. For the most part, overall resource condition and use would show slight change. Exceptions are hunting, fishing and off-road vehicle use, which would increase from approximately 270,000 activity occasions to 440,000 activity occasions due to continuing present trends.

Alternative 3, maximize wildlife and watershed conditions, would cause the most beneficial improvement in range, soil and water and wildlife habitat conditions. However, initial livestock use would be approximately 50 percent below current use levels and would not return to active preference levels within 20 years. This would create severe adverse social and economic impacts to livestock operators.

Alternative 4, 60 percent use levels, would result in vegetative and wildlife habitat condition improvement, but at rates slower than those described for the proposed action and alternative 3. Initial livestock use would be reduced by approximately seventeen percent. In 20 years, use would be approximately 35 percent above the current active grazing preference level of 113,122 AUMs.

Alternative 5, maximize livestock use, would have variable responses depending on the allotment stocking rates. Some allotments would exhibit range improvement while others would decline in condition. There would be little net change in the condition class acreage on native range. Large acreages of land treatment would provide additional livestock forage, however, wildlife habitat conditions would decline on these areas. Livestock use would increase from 113,122 AUMs to 146,361 AUMs (29 percent) over a 20-year period.

Table 2-12
Comparative Impact Summary
(Projected 20-Year Impacts)

Resource	Present Situation	Proposed Action	Alternative #1 No Livestock Grazing	Alternative #2 No Action	Alternative #3 Maximize Wildlife & Watershed	Alternative #4 60% Use Levels	Alternative #5 Maximize Livestock Use
Vegetation:							
Condition Class (% of area)							
Poor	57%	26%	57%	64%	25%	33%	36%
Fair	35%	27%	31%	24%	36%	24%	15%
Good	5%	20%	8%	9%	31%	16%	11%
Excellent	Trace	2%	2%	1%	6%	1%	2%
Treated	3%	25%	2%	2%	2%	26%	36%
Soils:							
Annual Erosion Rates	1.12 tons/acre/year	9% decrease	18% decrease	4% decrease	17% decrease	7% decrease	6% decrease
Water Resources:							
Watershed Condition	fair-poor	slight improvement	slight to moderate improvement	No Change	high improvement	slight improvement	No Change
Water Use by livestock & wildlife	125 acre-feet annually	156 acre-feet annually	7.5 acre-feet annually	125 acre-feet annually	125 acre-feet annually	168 acre-feet annually	168 acre-feet annually
Ecological Condition of Wildlife Habitat							
Mule Deer							
Summer Range	(413,400 acres)						
Poor	57%	23%	54%	61%	22%	30%	69%
Fair	38%	55%	36%	29%	41%	53%	18%
Good	5%	22%	10%	10%	37%	17%	13%
Winter Range	(394,000 acres)						
Poor	56%	22%	53%	60%	21%	29%	68%
Fair	37%	54%	35%	28%	40%	52%	17%
Good	7%	24%	12%	12%	39%	19%	15%
Antelope	(427,500 acres)						
Poor	58%	27%	55%	62%	23%	31%	70%
Fair	37%	29%	33%	26%	38%	26%	17%
Good	5%	44%	12%	12%	39%	43%	13%
Bighorn Sheep	(7,800 acres)						
Poor	5%	5%	4%	5%	5%	11%	18%
Fair	26%	20%	6%	26%	14%	20%	21%
Good	69%	75%	90%	69%	81%	69%	61%
Sage Grouse (nesting)	(187,600 acres)						
Poor	59%	25%	56%	64%	24%	32%	71%
Fair	37%	54%	35%	27%	40%	52%	17%
Good	4%	21%	9%	9%	36%	16%	12%
Meadow/Riparian Assoc Wildlife	(9,700 acres)						
Poor	5%	5%	3%	14%	3%	6%	21%
Fair	90%	83%	42%	79%	79%	87%	72%
Good	5%	12%	55%	7%	18%	7%	7%
Aquatic Wildlife:							
Fisheries Habitat Condition (% of 421 stream miles)							
Poor	51%	5%	3%	56%	3%	11%	65%
Fair	36%	55%	24%	31%	38%	76%	23%
Good	13%	40%	73%	13%	59%	13%	12%
Fisheries Water Quality and Quantity (% of 42 streams)							
Poor	57%	14%	7%	57%	11%	53%	60%
Fair	43%	71%	72%	43%	71%	47%	40%
Good	0%	14%	21%	0%	18%	0%	0%
Aquatic Community Richness (% of 42 streams)							
Poor	38%	9%	7%	38%	7%	35%	41%
Fair	45%	62%	57%	45%	60%	47%	47%
Good	17%	29%	36%	17%	33%	18%	15%
Trout Number & (pounds) of Trout Numbers	76,000 4,000	224,000 22,000	275,000 28,000	70,000 3,500	251,000 25,000	145,000 12,000	60,000 3,000
Wild Horses:							
Management Numbers	324	118-178	338	118-178	338	118-178	117-178

Table 2-12 (cont.)

Resource	Present Situation	Proposed Action	Alternative #1 No Livestock Grazing	Alternative #2 No Action	Alternative #3 Maximize Wild-life & Watershed	Alternative #4 60% Use Levels	Alternative #5 Maximize Livestock Use
Cultural Resources:	CR sites in good condition, however, 12.5 percent of known CR sites are deteriorating from livestcok trampling & erosion.	The P.A. would adversely impact CR sites slightly due to increased concentrations of livestock in previously ungrazed areas. Some CR site deterioration due to erosion would cease as a result of land treatments.	Adverse impact would cease; sites presently impacted would stabilize in good condition	Adverse impacts would continue on 63 known CR sites, presently unimpacted sites would be adversely impacted.	Adverse impacts would decrease slightly.	Adverse impacts would decrease slightly over those presently occurring from livestock concentrations.	Adverse impacts would increase moderately from increased livestock concentrations.
Visual Resource:	Scenic quality from dull to spectacular	Moderate enhancement of visual quality.	High enhancement of scenic quality.	Low degradation of scenic qualities.	Moderate to high enhancement of scenic quality.	Low to moderate degradation of scenic quality.	Moderate-high degradation of scenic quality.
Recreation:							
Off-Road Vehicle Quality	stable	slight decrease	Increase	No Change	Slight decrease	Slight decrease	Slight decline
Activity Occasions	175,000	300,000	300,000	300,000	300,000	300,000	300,000
Hunting Quality	declining	Increase	Increase	Decline	Increase	Slight increase	Decline
Activity Occassions	97,585	160,000	150,000	140,000	175,000	150,000	130,000
Fishing Quality	declining	Increase	Increase	Slight decline	Increase	Slight increase	Decline
Activity Occasions	724	1,500	2,000	1,100	1,700	1,300	1,000
Livestock Grazing:							
Initial AUM Allocation	113,122	78,336	0	113,122	56,507	93,921	113,122
Projected 20 Year AUM Allocation		142,276	0	113,122	104,214	153,402	146,361
Economics:							
Income Changes (Net Present Worth) Rancher	0	-$3.3 million	-$15.7 million	0	-$6.2 million	-$1.3 million	+$1.0 million
Regional-(includes rancher income)	0	-$3.2 million	-$20.8 million	0	-$6.5 million	-$1.5 million	+$1.6 million
National-(Includes range improvement costs)	0	-$2.8 million	-$0.2 million	0	-$1.6 million	-$2.6 million	-$3.7 million
Total (Includes Regional, State & National Income Changes)	0	-$6.5 million	-$23.2 million	0	-$8.9 million	-$4.0 million	-$1.9 million
Employment Changes years 1-10	0	-36 jobs	-174	0	-77	-12	+15
years 11-15	0	-22 jobs	-174	0	-18	- 4	+13
years 16-20	0	+ 6 jobs	-174	0	+12	+ 3	+10
Ranch Consolidations Number of operators	0	21	43	0	25	14	0
Social Conditions							
Values and Attitudes	Livestock operators in the study area perceive a good quality of life based on continuation of their ranching lifestyle. Recreation interests are mostly satisfied with opportunities within the study area. However, more hunting & fishing opportunities are desired.	21 operators may be forced to sell or consolidate which would threaten continuation of their ranching lifestyle. 18 ranchers would be pleased with increased allocation. Recreation users would be pleased with increased opportunities.	43 operators may be forced to consider consolidation or sales of their operation which would threaten continuation of their lifestyle. Recreation users would be pleased with increased opportunities.	Ranchers would be pleased that no change would be dictated by the government. Recreation users feelings would be the same as the present situation.	25 operators may be forced to sell or consolidate which would threaten continuation of their ranching increased allocations. Recreation users would be pleased with increased opportunities.	14 ranchers may be forced to sell or consolidate which would threaten continuation of their ranching lifestyle. 34 operators would be pleased with increased allocations. Recreation users would be pleased with increased opportunties.	Ranchers would be pleased that no changes in their lifestyle would be dictated by the government. Recreation users would be disappointed that there wuold be a reduction in recreation opportunities.

INTERRELATIONSHIPS

BLM's programs and proposals are closely related to the programs of other agencies and individuals. The following interrelationships exist.

Environmental Protection Agency

The Environmental Protection Agency (EPA) has been given initial responsibility for implementing Section 208 of the Federal Water Pollution Control Act Amendment of 1972. Under this act and Executive Order 12088, BLM is required to control water pollution that originates from large areas of public land (nonpoint source pollution). EPA is working through area-wide water quality management agencies and local Soil Conservation Service offices to complete plans for controlling water pollution in problem areas. Once these plans are finalized, BLM will take whatever measures necessary to comply with their requirements.

U.S. Fish and Wildlife Service

The Fish and Wildlife Service conducts predator control in the EIS area under a joint agreement with BLM and the Idaho Department of Fish and Game. The control consists of aerial shooting and limited trapping of coyotes, mostly during the fall, winter, and early spring. No chemical toxicants are used.

The Fish and Wildlife Service also serves as the consulting agency under the Endangered Species Act of 1973. Informal consultation was conducted relative to peregrine falcons, bald eagles and Threatened and Endangered plants within the EIS area.

Idaho Department of Fish and Game

The Idaho Department of Fish and Game (IDF&G) has established state goals and objectives for wildlife management on public lands within the EIS area. Since wildlife habitat would be affected by the proposed grazing management (especially the grazing system stocking rate), there has been close coordination between BLM and IDF&G in developing the proposed action. Specifically, the IDF&G has cooperated with BLM in determining existing big game numbers and projecting desirable herd size for the EIS area by 1990. Joint studies are being conducted to determine winter ranges, migration routes and strutting grounds. Radio tracking, aerial census, and collars are being used. Studies are being conducted to determine feasibility of additional bighorn sheep transplants. Also, the IDF&G would review all proposals for chemical vegetative treatment.

Idaho Department of Health and Welfare

BLM entered into a cooperative agreement in September, 1979, with the Idaho Department of Health and Welfare, with a common objective of protecting water and air resources within the state. The agreement provides for information exchange and agency coordination in solving state water and air quality problems.

Idaho Department of Lands

The Idaho Department of Lands (IDL) administers approximately 127,000 acres of land within allotments in the EIS area. These lands are leased by livestock operators for grazing on ten-year terms. That portion which is located in the intensive management category (84,000 acres) would be directly affected by management on BLM ranges because their intermingled location makes separate management impracticable. The IDPL has tenatively agreed to accept the BLM's calculation of AUMs allowable on state lands where the forage inventories are comparable. Where a difference exists in which the IDL inventory is greater, a joint recheck will be run in an effort to reconcile differences. A cooperative or integrated "Ranch Plan" with the permittees, SCS, State of Idaho and BLM is recommended for allotments with predominantly private or state land (less intensive management category). There are approximately 19,000 acres of state land within this category. The remaining state land (24,000 acres) is located in allotments which are managed in association with private lands.

The Owyhee MFP has identified tentative exchange proposals in an effort to block up State of Idaho lands and public lands in the Owyhee Resource Area for more effective administration.

Cooperative range improvements and a controlled burning study with the University of Idaho is currently in progress on intermingled lands.

Idaho Department of Parks and Recreation

The Idaho Department of Parks and Recreation has certain responsibilities for evaluating and enhancing recreation opportunities throughout the state. As a part of its' program, the department has published a State Comprehensive Outdoor Recreation Plan (SCORP). This plan relies upon the continued use of lands administered by BLM or other agencies to fulfill many of the recreational needs within the state. These needs were considered in formulating the proposed action. The department has identified the Murphy area as a key ORV park possibility.

State Historic Preservation Office

As suggested by the memorandum of agreement between the Advisory/Council on Historic Preservation and the State Historical Preservation Office (SHPO) the Class II cultural resource inventory was designed and performed in cooperation with (SHPO) archaeologist. The SHPO site locational data was utilized in estimations of cultural site density, diversity and distribution. Final estimates of impacts of the proposal and alternatives have been discussed with the SHPO archaeologist.

County Planning

Portions of Owyhee County and Malheur County are included in the EIS area. Although none of the county plans or zoning regulations put binding constraints on public land management, the BLM is obligated to avoid decisions that might conflict with local planning. Potential conflicts with county planning and zoning were discussed during the

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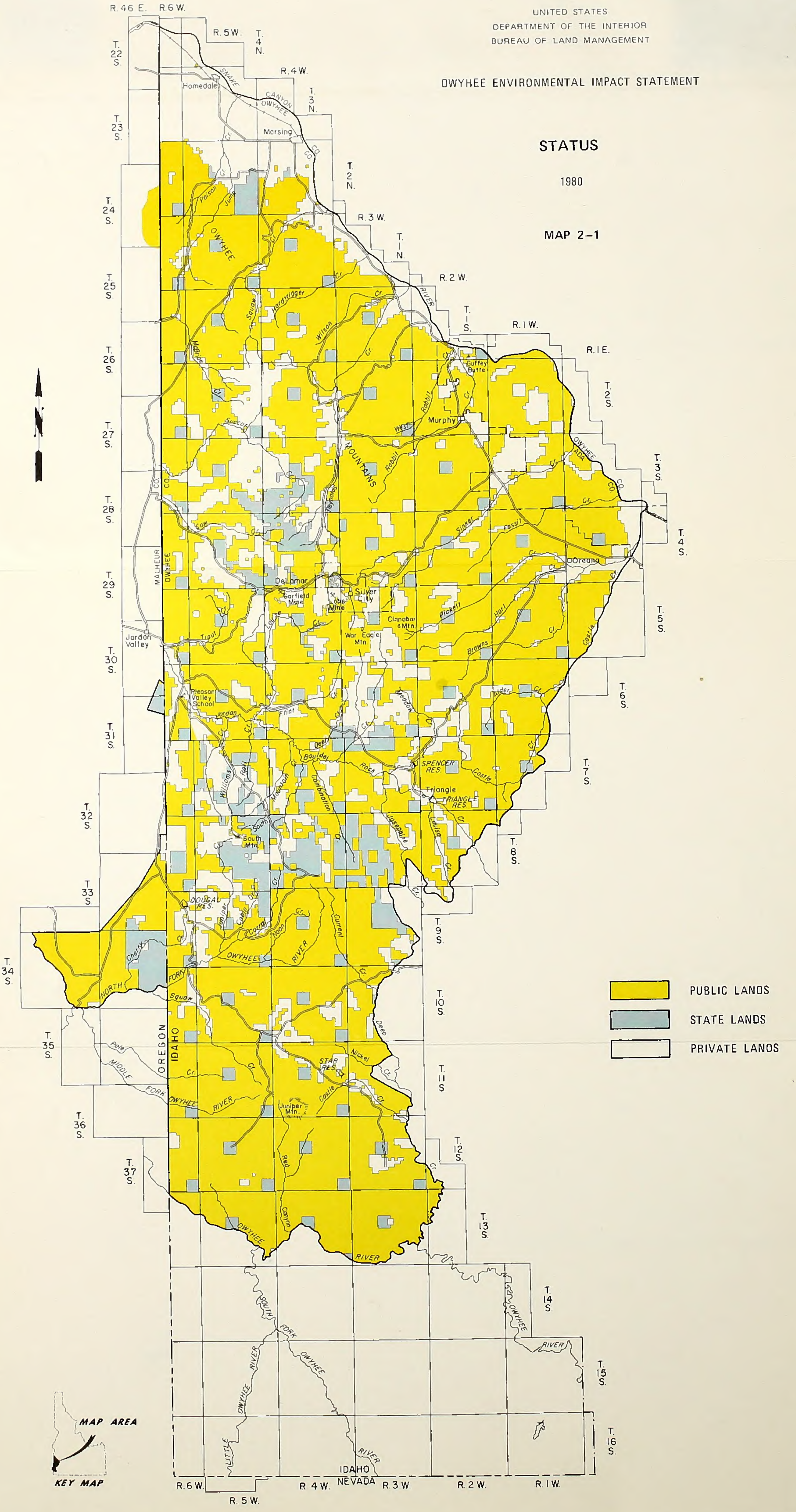
BUREAU OF LAND MANAGEMENT

OWYHEE ENVIRONMENTAL IMPACT STATEMENT

STATUS

1980

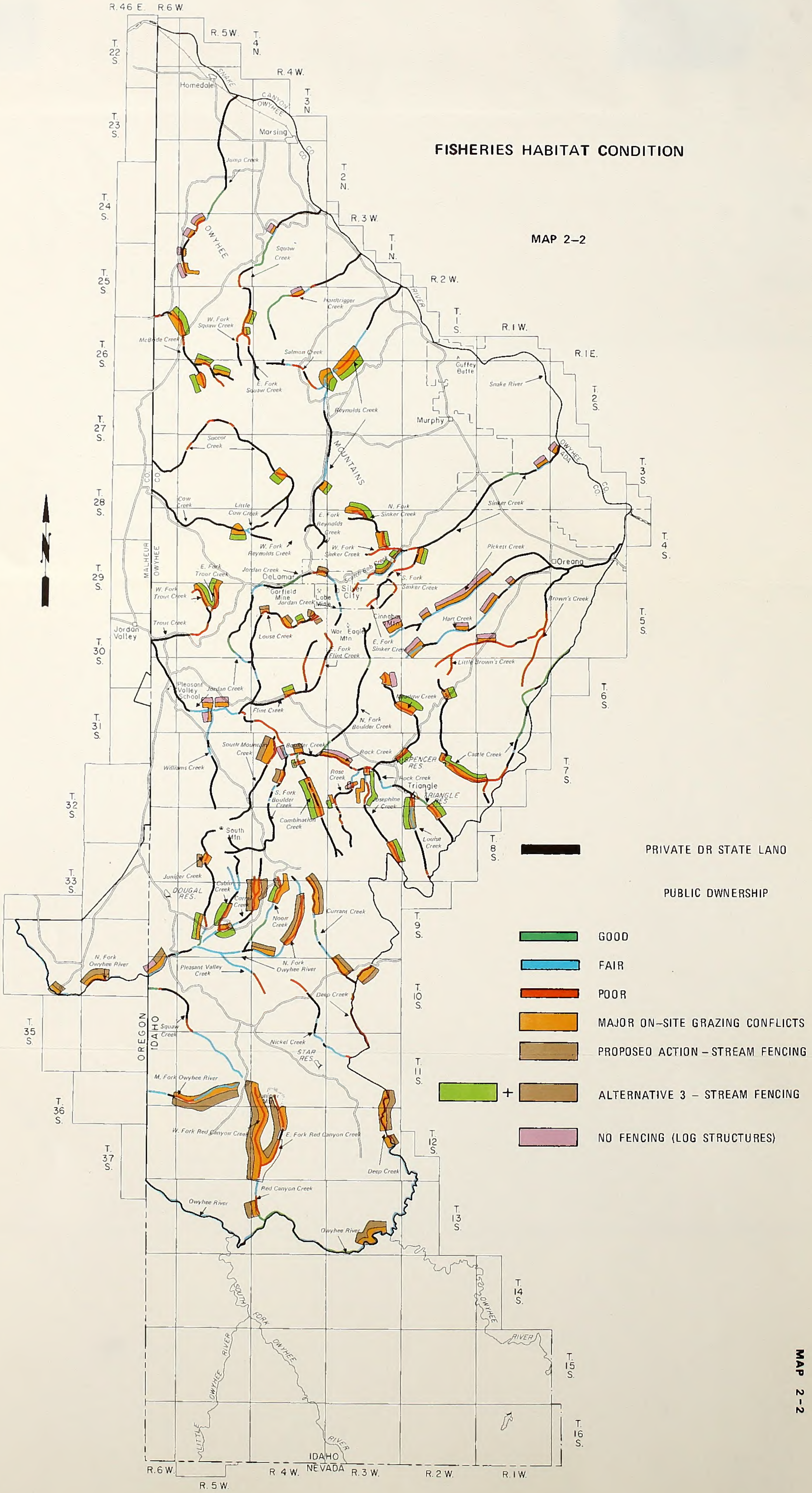
MAP 2-1



MAP 2-1

FISHERIES HABITAT CONDITION

MAP 2–2



MAP 2-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

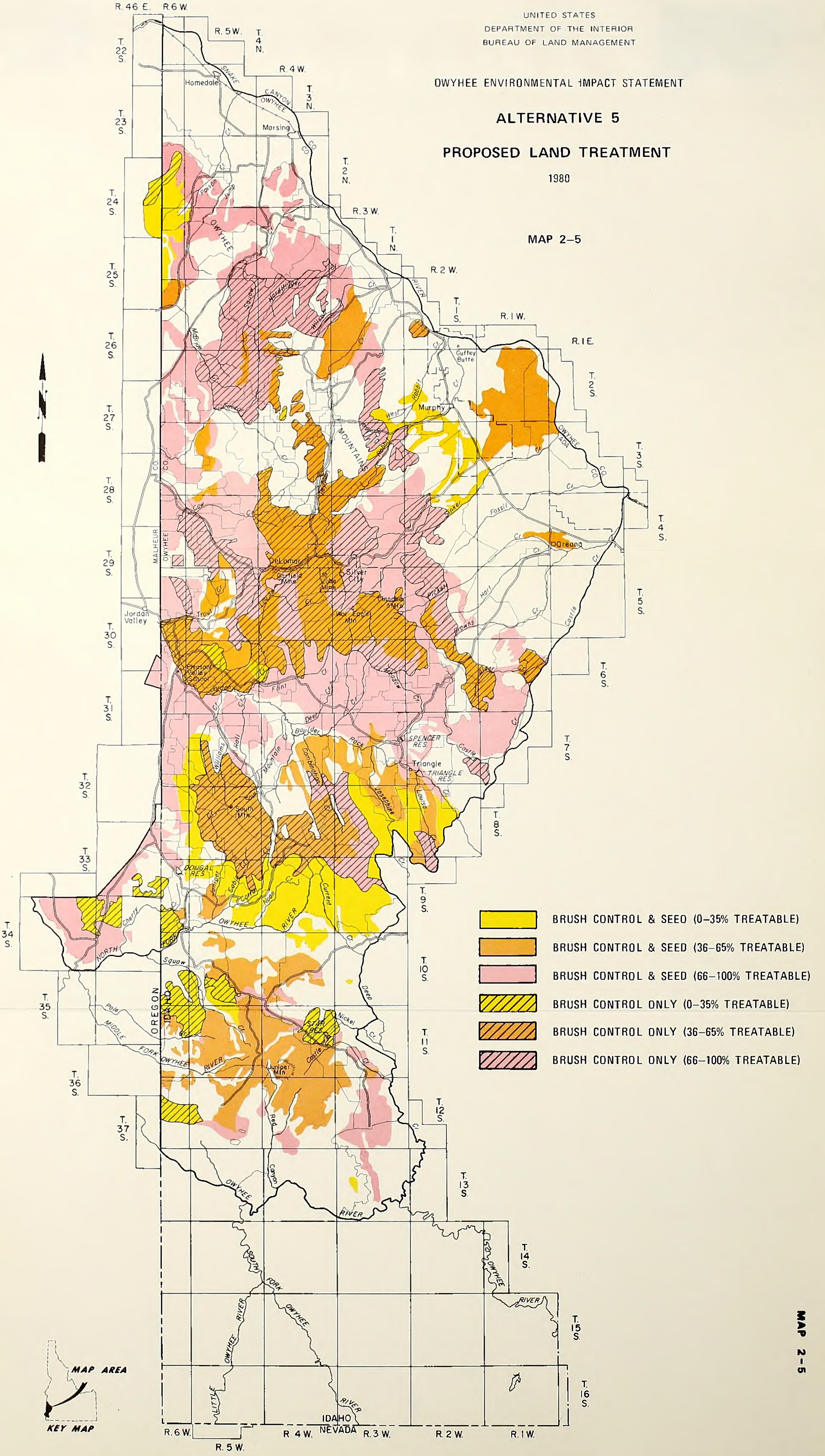
OWYHEE ENVIRONMENTAL IMPACT STATEMENT

ALTERNATIVE 5

PROPOSED LAND TREATMENT

1980

MAP 2–5



CHAPTER 3

AFFECTED ENVIRONMENT

Introduction

This chapter contains a brief introduction and general setting of the Owyhee EIS area followed by descriptions of environmental components which would be significantly impacted by the proposal or alternatives.

The EIS area is located in southwestern Idaho and southwestern Oregon. The topography is gently rolling to mountainous and dissected by several major streams. The elevation ranges from 2,400 feet along the Snake River to 8,100 feet in the Owyhee Mountains (Map 3-1). Air quality is generally good. Occasional strong winds cause soil movement from agricultural land and occasional range fires cause minor localized air quality problems.

Winter temperatures rarely dip below 0°F while summer temperatures frequently rise above 100°F. (Martin and Corbin 1959). Precipitation information gathered at the Reynolds Creek experimental watershed located within the EIS area has determined that November, December, and January are the wettest months while July, August, and September are the driest (Hanson, et. al. 1980). Floods in the area occur mostly during April and May, coinciding with seasonal snowmelt (Rice 1959).

Precipitation ranges from approximately seven inches on the lower elevations to over 40 inches at the higher elevations. Precipitation data collected over a sixteen-year period indicates 41 percent of the average annual precipitation fell May through October at low elevations, whereas only 24 percent fell during this same period at high elevations.

VEGETATION

Introduction

The Owyhee EIS area has eight major ecological communities: big sagebrush, low sagebrush, nonproductive (rock outcrop and barren lands), salt-desert shrub, woodland, treated (seedings, sprays, and burns), and meadow/riparian. Each ecological type can be characterized by a group of ecological sites (Appendix Table F-1); (see Map 3-2 for locations of each vegetation type). Ecological site descriptions are available for review at the Boise district office.

The vegetation types and ecological sites were described in a vegetation inventory and analysis (1977-1978) using methodologies described in Appendix F. The acres of each ecological type by allotment have been tabulated and are available upon request.

Vegetation Impact Assessment Parameters

Several parameters were used to assess the environmental impacts to vegetation. The parameters included assessments of ecological condition, trend, cover, and productivity. Additional impact assessment of the meadow/riparian ecological community and Endangered and Threatened species is presented because of their environmentally critical nature.

Ecological Condition and Trend

Condition is the present state of vegetation of an ecological site in relation to the climax (natural potential) plant community for that site. Plant composition for each climax ecological site was determined from 1977-1978 clipping studies, range site guides and records of the Soil Conservation Service (SCS), Science and Education Association (SEA), United States Forest Service (USFS), and Bureau of Land Management (BLM). Condition was expressed in terms of the relative degree to which kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community (SCS 1976).

Trend is defined as the direction of change in ecological condition. Trend was assessed in terms of "apparent trend" observations and comparison of earlier BLM range studies (Appendix F). Present range condition is a result of a sustained trend over a period of time (SCS 1976).

In the Owyhee EIS area, the grazing of the key species grasses (Indian rice grass, bluebunch wheatgrass, Idaho fescue), during their critical spring growth stages, has led to a general decline in their respective vigor (see Tables 3-1 and 3-2). A plant's ability to withstand grazing and reproduce is a function of its overall vigor (health). Changes in grazing intensity and season are first reflected in plant vigor and later by changes in plant density, plant composition, and soil stability (Parker 1954).

Currently, 56.8 percent (575,924 acres) of the Owyhee EIS area is in poor ecological condition (Map 3-3). This is primarily due to "overbalance" of shrubs and the lack of preferred climax grass species (Indian rice grass, bluebunch wheatgrass, and Idaho fescue). Of the remaining area, (412,324 acres) 35.2 percent, 5.1 percent, and 0.3 percent are in fair, good, and excellent condition, respectively.

On 2.6 percent (26,048 acres) of the area, condition could not be compared to an ecological climax, because of the area's disturbed nature (e.g., seedings, sprays, burns). A condition class summary by allotment is presented in Appendix Table F-4.

Presently 55.2 percent (560,365 acres) of the Owyhee EIS area show a declining trend and 7.6 percent (76,695 acres) show an upward trend (see Map 3-3). On the remaining 37.2 percent (377,237 acres) trend was assessed as static or nonapparent. Estimates of range trend by acres and allotment are presented in Appendix Table F-5.

Table 3-1
Average Plant Grazing Readiness
Dates by Elevation for Selected Species[1/]

Elevation (Feet)	Sandberg bluegrass	bottlebrush squirreltail	bluebunch wheatgrass	Idaho fescue	antelope bitterbrush
3,000	4-21	4-28	4-28	2/	2/
4,000	6-21	7-7	7-7	7-14	7-14
5,000	5-21	5-28	5-28	6-7	6-7
6,000	6-7	6-14	6-14	6-21	6-21

1/ Spring grazing before this date will be during the critical growth period of the plant (based on BLM phenology studies conducted in 1977 and 1978 in the Owyhee Resource Area).

2/ No data available for these elevations.

Table 3-2
Average Plant Seed-Ripe Dates
by Elevation for Selected Species[1/]

Elevation (feet)	Sandberg bluegrass	bottlebrush squirreltail	bluebunch wheatgrass	Idaho fescue	antelope bitterbrush
3,000	6-7	6-21	2/	2/	2/
4,000	6-21	7-7	7-7	7-14	7-14
5,000	7-7	7-21	7-21	7-28	7-28
6,000	7-21	8-7	8-7	8-14	8-14

1/ Graze after this date to get seed dispersal after seed development (based on BLM phenology studies conducted in 1977 and 1978 in the Owyhee Resource Area).

2/ No data available for these elevations.

Cover

Cover is the amount of ground surface protected by canopies of living vegetation, litter (dead organic matter), and variously sized stones. Cover was estimated using step-point transects at clipping plot and range condition writeup locations. Ecological strata cover factors became one of the primary inputs to soil loss calculations using Musgrave's Equation (see soils Appendix H). Ecological site effective ground cover is summarized in Appendix Table F-2.

Examination of exclosure studies in the Owyhee Resource Area indicates effective ground cover of ecological communities in poor condition is 15-25 percent below what potentially might exist if communities were in excellent condition.

In the poorer condition areas, annual vegetation cover in the shrub interspaces varies drastically, depending on annual precipitation and the corresponding successful germination of annual plants (e.g., cheatgrass, mustards, Russian thistle). On areas of better ecological condition, perennial plants may provide a lesser cover than annuals in "good precipitation years"; but perennials do provide a more stable community to offset the lack of annuals in the "low precipitation years."

Productivity

Vegetation productivity was expressed as the air-dry weight (pounds per acre) of the above ground, annual, live-green production. Weight is the most meaningful expression of the productivity of a plant community or an individual species (SCS 1976). The 1977-1978 clipping studies served as the primary measure of the ecological site's productivity. Historical records and long-term production data from the Reynolds Creek area served to correct 1977-1978 data to average annual production.

Currently, with few exceptions, total vegetation production on most allotments is dominated by shrubby species (55 percent or more of total annual production). Average per acre production by allotment shows a wide variability, ranging from 181 to 1,835 air-dry pounds per acre. Vegetation production and composition data by allotment are available upon request.

Current usable forage production in the EIS area is 50,472,000 pounds (equivalent to 63,090 cattle AUMs). Average useable forage per EIS acre is 49.8 air-dry pounds. Vegetation and composition data by allotment are available upon request at the BLM Boise district office.

Meadow/Riparian Vegetation

The most environmentally critical ecological type, meadow/riparian, covers the least acreage of the EIS area; one percent of the public lands (9,718 acres). Vegetation in the semi-wet and wet meadow communities (7,721 acres) is dominated by sedge, rush, bluegrasses, and iris. Cottonwood, aspen and willow overstories with bluegrass, sedge, and rush understories characterize the riparian areas (1,997 acres).

The vegetation inventory indicated 93.4 percent (9,068 acres) of the area in the meadow/riparian community to be in poor to fair ecological condition with downward trend (Table 3-3). Previously fenced meadow/riparian areas in the Owyhee Resource Area indicate potential effective ground cover should approximate 95 percent, current cover (determined from step-point transects) is 75 percent. Utilization studies indicate livestock and wildlife are currently harvesting 90 percent or more of the annual usable forage production associated with this ecological community. Pellet transect studies (see aquatic wildlife section) also substantiate the heavy grazing use of this ecological community.

Table 3-3
Present Condition Class
Summary of the Meadow/Riparian Ecological Community[1]

Ecological Community	CONDITION CLASS					
	POOR		FAIR		GOOD	
	(acres)	(% of area)[2]	(acres)	(% of area)	(acres)	(% of area)
Meadow/ Riparian	1,408	14.5	7,660	78.9	650	6.6

1/ More specific information on riparian condition is discussed in the aquatic wildlife section.

2/ Percent of area in poor as related to total area in meadow/riparian ecological community.

Threatened and Endangered Plants

In 1977-1978, a study was undertaken to collect basic information and exact locations of Endangered, Threatened, and Uncommon plants on public lands in the Boise district of the BLM. The final report, Endangered, Threatened, and Uncommon Plants Inventory Report for the Boise District Bureau of Land Management, is on file at the district office. Data from another report (Henderson et. al. 1977) also aided in this inventory. Nine Endangered plants, fifteen Threatened plants and ten uncommon plants occur within the EIS area. A list of plants is presented in Appendix Table

Most species of concern in this study are listed on the Federal Register June 1, 1976, or the Provisional List of Rare, Threatened and Endangered Plants in Oregon. Also considered were those plants thought to be Threatened, Endangered, or Uncommon by Dr. Patricia Packard, Professor of Biology, College of Idaho, Caldwell, Idaho.

As required by Section 7 of the Endangered Species Act, consultation was conducted with the U.S. Fish and Wildlife Service regarding impacts to Threatened and Endangered plant species. On February 20, the Boise area office of the Fish and Wildlife Service indicated that the proposed action and alternatives would not jeopardize Threatened and Endangered plants, providing site specific consultations were held as needed (J. Gebhardt 1979, personal communication). Because site specific clearances are required for these plants prior to project implementation, no further mention of impacts will be made in the EIS.

SOILS

The Owyhee Resource Area has three physiographic regions: the Snake River Sediments, the Owyhee Uplands, and the High Rhyolite and Basalt Plateaus. The Snake River Sediments are dry, warm, saline, and sandy, or silty. This is where most of the agricultural land exists. They also have a high potential for wind, rill, and gully erosion. The high plateau and the uplands are old formations; consequently most of the soils have well-developed subsoils (heavy clay). Because of the broad range in elevations, rainfall, and temperatures, the Owyhee Resource Area has many diverse and complex soil patterns (Map 3-4).

A third order soil survey, which meets the National Cooperative Soil Survey standards, was conducted in the Owyhee Resource Area during 1977 and 1978. This information is available at the Boise district office. The soil survey was used for evaluating land use potentials, helping establish potential natural plant communities, establishing initial stocking rates, and predicting erosional responses. When analyzing the effects of livestock grazing on soils, three major soil parameters are affected: soil compaction, soil erosion, and soil productivity or fertility.

Soil erosion is cyclic. Since the turn-of-the-century much of the ORA has gone through two or more erosional cycles. According to the vegetation inventory, the ORA presently shows 560,364 acres expressing a downward trend, 377,237 acres as static, and 76,695 acres as upward. Present erosional conditions express present and past range condition. To analyze present condition, the proposed action, and the alternatives, vegetative cover and trend will be used to determine the short and long-term erosion rates. Soil erosion rates represent soil movement, not soil loss. However long-term soil erosion rates do reflect long-term soil loss. See Appendix Table H-1 for an allotment analysis of long-term soil erosion rates.

Musgrave's Soil Loss Equation is used to help analyze the impacts of livestock grazing on soils. Musgrave's Soil Loss Equation is fully discussed in Appendix H.

Rill and gully erosion potentials are low on most of the ORA except on the Snake River Sediments (269,180 acres) and the granitic soils (86,410 acres). In the Snake River Sediments rill and gully erosion will generally behave similar to sheet erosion. As sheet erosion increases, the rill and gully erosion potential increases. The volumes in tons/acre/year for rill and gully erosion are higher than those values expressed for sheet erosion. On granitic soils, sheet erosion potentials are low because infiltration rates are high. However, once overland flow occurs, rill and gully erosion potentials increase dramatically. For a map of rill and gully erosion susceptibilities, see the Boise district URA (Unit Resource Analysis).

Musgrave's soil loss equation shows the average annual soil loss by sheet erosion for the ORA to be approximately 1.12 tons/acre/year. This erosion rate is 25 percent higher than what would occur if the ORA was in excellent vegetative condition. Because the knowledge of soil erosion and its effect on rangeland is at an early stage of development, standards for what rates are considered permissable were not developed. According to the research from the Reynolds Creek Experimental Station (Johnson, C.W. and Karl A. Gebhardt, 1979), a change in erosion rates of less than 20 percent is not statistically measurable (see Appendix H, Musgraves Analysis). Applying this to the ORA shows that the present erosion rates are statistically higher (25 percent) than the natural erosion rates.

As soil erosion and compaction increase, soil fertility levels decrease. The more soils become compacted and/or the longer the erosion rates are above natural conditions, the lower will be the soil's ability to produce vegetation. Not only would production drop but so would the proportion of certain key plant species.

The information on soil compaction is very limited in the ORA, making quantification of the existing problems difficult. However, certain assumptions are reasonable and consistent with field observations and research. Almost all allotments and pastures with large areas of poor condition range are being overutilized. These areas usually occur on slopes less than 20 percent and are usually associated with better soils. Overutilization has increased the effect of trampling and this has increased soil compaction. The effect of high grazing pressure has lowered plant vigor, reduced canopy cover, and hindered germination and seedling establishment. Current range data indicates production in most poor condition areas to be below the potential of the soil to produce vegetation. Several studies on grazing intensity consider heavy trampling to be more harmful to the soil than excessive grazing is to the plants. Both impacts affect vegetative production and cover.

There are certain areas where compaction has become severe. These areas are associated with springs, other wet areas, intensively disturbed areas and the 44 allotments where turn out dates are too early. Grazing on unprotected riparian vegetation has also caused significant surface disturbance from trampling.

Intensively disturbed areas are roads, salting grounds, reservoirs, gates, watering troughs or other areas drastically altered by grazing. Creation of these areas are unavoidable when establishing grazing systems. In many areas in the ORA, good range management has minimized the size and adverse effects from these areas. Most intensively disturbed areas like watering troughs and salting grounds are less than 5,000 square feet. Many of these intensively disturbed areas are located far enough away from natural water systems to keep their impacts local. However enough of these areas have been poorly located, making their effects on water quality and sedimentation significant. See the aquatic wildlife and water quality sections for more details.

There are 44 allotments where existing turn out dates are earlier than range readiness (i.e. 4-6 inch leaf height of bluebunch wheatgrass; 2-3 inch leaf height of Idaho fescue). There is high potential for soil moisture to be at a level for increasing soil compaction. Even though most soil compaction may be counteracted by frost heaving yearly, grazing too early in the spring will recompact and trample the soil during periods of high runoff. The significance of increased soil compaction is felt when above average high intensive rainstorms occur on overutilized poor condition range. Because protection from raindrop splash has been reduced and infiltration rates have been lowered, the soil is more susceptible to accelerated runoff and erosion. The above situation has occurred in the ORA. Soil compaction has also increased the erosion susceptibility of the ORA to late spring, summer, and fall rainstorms.

WATER RESOURCES

The Owyhee Resource Area lies in the Upper Snake River Basin. It comprises approximately four percent of this larger unit. About one-third of the EIS area drains directly into the Snake River. The other two-thirds is drained by the Owyhee River which flows into the Snake River futher downstream in Oregon.

Watershed Condition

Present upland watershed condition was analyzed on 29 separate allotments which lie on or adjacent to streams. In addition to their proximity to water, these allotments are characterized by a high or low susceptibility to sheet erosion. Each allotment was analyzed in terms of current erosion rates, erosion conditon, ground cover, range condition and erosion susceptibility (Table 4-7).

Overall, upland watershed conditions on the majority of the allotments analyzed appear to be stable. Even though range condition ratings are low in some allotments, the total effective ground cover is 50 percent or greater on nearly all allotments providing adequate soil protection. On the one allotment where ground cover and range condition are both low, the soil is not very susceptible to erosion and the erosion rate is 0.63 tons/acre/year. Current erosion rates are 2.59 tons/acre/year or less on all of these allotments.

Even though these allotments are in a fairly stable condition and may not be affected by the long-term average precipitation, they are susceptable to occassional large precipitation events. These are the storms which cause flooding and soil movement problems. This suggests that improved watershed conditions are desirable and can be obtained by improving vegetation cover through improved range condition.

Water Availability

The EIS area is drained by 27 major perennial streams and fifteen major intermittant streams. Approximately 201 reservoirs have been constructed with an estimated storage capacity of 350 acre-feet. Approximately 185 spring developments have been constructed which contribute towards an estimated annual spring yield of 300-400 acre-feet for the area. Total annual water yield for the resource area is approximately 412,190 acre-feet.

An unknown number of springs and reservoirs in the EIS area have been fenced. Fencing has served three purposes: providing the highest quality water possible for use by livestock and wildlife, protecting the project development and allowing riparian vegetation to become established, stabilizing the site.

Runoff in the EIS area occurs mainly from seasonal snowmelt. Observation on runoff at Reynolds Creek for fourteen years, indicate peak flows occur between April and June, with May recording the highest amount (Reynolds Creek Watershed Report No. 8, 1978). Reynolds Creek is representative of most streams is the EIS area in this regard.

Water Use

The primary use of water in the EIS area is for irrigation of 94,000 acres of cropland which consumes about 215,250 acre-feet annually. Livestock and wildlife consume approximately 125 acre-feet annually. Spring runoff from the watersheds of the EIS area is important to these downstream water uses. This runoff is used for pasture and crop irrigation and fills reservoirs storing water for use during the drier months of the year.

Water use in the EIS area is dependent to a degree upon water quality. For a discussion of water quality, refer to the aquatic wildlife section.

TERRESTRIAL WILDLIFE

Introduction

The EIS area contains a diversity of wildlife habitats and species. This stems from the broad array of vegetation types and the inclusion of special habitat features such as cliffs, snags, reservoirs, springs, meadows and streamside riparian zones.

The EIS area supports 158 resident and 183 migratory species of wildlife. This includes 71 mammals, 244 birds, nineteen reptiles and eight amphibians. A species list by season-of-use can be found in the Owyhee Resource Area, Unit Resource Analysis (URA) on file in the Boise district BLM office, Boise, Idaho.

Only those species whose habitat and resulting populations could be significantly impacted by the proposed action or alternatives will be discussed in the EIS. The other important wildlife species present in the EIS area will not be discussed further for the following reasons:

(1) The species occur incidently (black bear, sharp-tailed grouse), as rare migrants (osprey, merlin), or have very limited populations and lack significant habitat (elk, ruffed grouse, long-billed curlew).

(2) The species are not expected to be significantly impacted by the proposed action or alternatives. These are the mountain lion, golden eagle, prairie falcon, western burrowing owl, mourning doves, chukar, red fox, bobwhite quail, ring-necked pheasant, and Hungarian partridge.

Endangered and Threatened Species

A review of the Threatened and Endangered species lists in the Federal Register was performed and the only listed species known to occur in the EIS area are the bald eagle and peregrine falcon.

There are no known or suspected breeding pairs of bald eagles in the EIS area. There are however, a small number of birds (less than ten) that use the area during the fall, winter and spring (Map 3-5). The area of use is along the Snake River, although sightings have been recorded along the East Fork of Owyhee River and Jordan, Cow and Deep creeks.

Peregrines, like bald eagles, are a listed Endangered species. No breeding pairs are known in the EIS area and sightings are very rare. Single sightings have been documented from 1971 to 1974 and in 1979.

As required by Section 7 of the Endangered Species Act, consultation was conducted with the U.S. Fish and Wildlife Service regarding impacts to Endangered and Threatened species. On February 12, 1980, the Boise Area Office of the Fish and Wildlife Service indicated neither the proposed action nor the alternatives would jeopardize the bald eagle or the peregrine falcon (R. Howard, 1980, personal communication). No further mention of the bald eagle or peregrine falcon will be made in the EIS.

Mule Deer

Mule deer are the most numerous big game species in the EIS area. There are approximately 807,400 acres of mule deer habitat, of which 51 percent is summer range and 49 percent is winter range (Appendix Table J-2). Presently in the EIS area, there are approximately 1,880 deer using the summer range and 2,905 wintering deer. Herd composition data (fawn/doe ratios and percentage of young bucks in the harvest), hunter success, and winter range trend counts indicates that mule deer populations are increasing.

Winter ranges are occupied by the resident deer herd and by deer migrating from outside the EIS area. Map 3-6 illustrates deer winter and summer ranges located in the EIS area. Appendix Table J-1 describes population estimates by geographical areas.

During the summer, most deer range over higher elevations, utilizing habitat types such as mountain shrub, conifer, meadow and juniper. The principal deer summer ranges in the EIS area are in the Owyhee Mountains, South Mountain and Juniper Mountain areas. Deep snow accumulation prevents these areas from being used in winter.

Habitat on both summer and winter deer ranges is in unsatisfactory condition. The 1977-78 BLM range survey indicated that 93 percent (366,400 acres) of the winter range and 95 percent of the summer range (387,400 acres) in the EIS area are in poor or fair ecological condition. These conditions do not provide the quality diet of forbs, grasses, and shrubs required by deer to maintain productivity and survive severe climate conditions.

A study by Trout and Thiessen (1973), in Owyhee County, indicated existing deer diets are not optimum. Table 3-4 compares these existing diets with what a quality diet should be in a similar area in good ecological condition.

In comparison to sharing ranges in good ecological condition, when livestock and deer are forced to compete for forage on ranges in poor and fair ecological condition, they experience a greater conflict in diet overlap. This occurs because fewer quality forage plants comprise the vegetative community in these lower ecological conditions. In spring, livestock and deer feed on emerging grasses and forbs while in summer and fall, livestock and deer switch to a predominantly browse diet. This becomes a major problem when livestock are permitted to graze in deer wintering areas and reduce the availability of palatable browse needed by the deer.

The 1973 Fish and Game study and the BLM Owyhee range inventory showed that the present condition of ecological sites in the EIS area do not provide the proper mixture of palatable species needed for a quality mule deer diet.

Table 3-4
Existing mule deer seasonal food habits*, (Owyhee Resource Area)

Plant Class	Spring Apr-Jun	Summer Jul-Sept	Fall Oct-Dec	Winter Jan-Mar
Grass	65%	7%	7%	5%
Forbs	10%	8%	9%	5%
Shrubs	20%	77%	71%	86%
Unidentified	5%	8%	13%	4%

* (Trout and Thiessen 1973)

Optimum Mule Deer Diet**

Plant Class	Spring Apr-Jun	Summer Jul-Sept	Fall Oct-Dec	Winter Jan-Mar
Grass	40%	5%	10%	5%
Forbs	20%	50%	30%	15%
Shrubs	40%	45%	60%	80%

** (From Literature Review)

Antelope

Populations of antelope are scattered throughout the EIS area. Appendix Table J-3 describes population estimates by geographical areas. Herd composition data available for the EIS area since 1974 indicates poor fawn production and survival which reflects a declining population, probably resulting from poor habitat conditions.

There are approximately 427,500 acres of winter and summer ranges used by resident and migratory herds. Movement of antelope from summer to winter ranges appears to be in response to habitat restriction imposed by snow rather than by distinct migration routes. Populations along the western edge of the EIS area winter in Oregon. Map 3-6 illustrates the summer and winter ranges of the estimated 725 antelope that use the EIS area. The BLM range survey found 95 percent (406,100 acres) of the antelope range is in fair and poor ecological condition. (Appendix Table J-2).

Principal pronghorn forage consists of browse throughout the year. Highest use of grasses and forbs occurs during the spring and summer. Native forage species such as bitterbrush, elderberry, serviceberry, balsamroot, penstemon, lupine, and clover provide the necessary supplements to the staple sagebrush diet.

When ranges are in poor condition and forage is limited, competition occurs between all herbivorous animals. However, there is little or no competition between antelope and livestock on ranges in good condition.

Antelope generally use habitat within four miles of water and most of the antelope habitat in the EIS area falls within this four mile limit. These are maximum distances however, and optimum antelope distribution is not being achieved due to limited water in some areas.

Bighorn Sheep

California bighorn sheep formerly ranged over Owyhee County but were eliminated by the 1920s. Between 1963 and 1966, 38 sheep were released into the Owyhee River canyon east of the EIS area. The population has increased and expanded into the EIS area along the Owyhee River and Deep Creek. At present, an estimated 80 animals occur within the EIS area. Ewe-lamb ratios have been consistently good; generally exceeding 60 lambs per 100 ewes.

The bighorn sheep range is used on a yearlong basis. They currently use the area illustrated in Map 3-6. There is 69 percent, or 5,400 acres in good or excellent ecological condition. Only five percent is in poor condition (Appendix Table J-2).

Grasses are the staple forage for bighorns during all seasons but are particularly important during spring and summer. Bluebunch wheatgrass comprises a large part of the yearlong diet. Other grasses and shrub species such as Great Basin wild rye, Idaho fescue, sandberg bluegrass, bitterbrush and willow make up the rest of the diet. Browse becomes important during fall and comprises the greater part of their diet in winter.

Bighorn use is largely confined to the canyons and adjacent plateaus up to one mile from the canyon rims. Cattle use is generally limited to the plateau areas. Pellet group and utilization studies conducted on these plateaus in 1979, indicated that except in the vicinity of water, utilization by all the grazing animals (cattle, bighorn, antelope and mule deer) is light.

Sage Grouse

Sage grouse are one of the most important game birds of the EIS area. They are widely scattered in the low and big sagebrush communities. Based upon strutting ground counts, populations seem to be increasing in the western portion of the area and remaining stable in the eastern portion.

Distribution of sage grouse in the EIS area is shown on Map 3-7. The distribution of nesting habitat is based mainly on locations of strutting grounds. Strutting grounds are natural open clearings surrounded by sagebrush where males gather every year to court females. These areas are important since most females nest within two miles of the grounds (Western States Sage Grouse Committee 1974).

There are approximately 620,950 acres of sage grouse habitat in the EIS area. This acreage includes nesting, brood rearing and wintering areas. It is estimated about 187,600 acres are used for nesting, of which four percent is in good, 37 percent is in fair and 59 percent is in poor ecological condition (Appendix Table J-2). This high amount of poor and fair ecological condition illustrates the limited quantity of understory vegetation currently found in the nesting areas. This results in less cover for nesting and lower brood success rates. Sagebrush canopy cover, a critical factor for nesting, is quite good in these areas.

Of the important brood rearing habitat (meadows) 69 percent is located on private lands. Approximately 7,700 acres of BLM land contain the meadow complexes needed to provide good brood rearing cover. There are 90 percent of these acres in fair ecological condition.

Ecological condition of meadows does not directly relate to brood habitat requirements. Although most meadows are in fair ecological condition, the intense livestock use on these areas results in an average utilization in excess of 90 percent. This results in less cover to hide chicks from predators and lowers insect production. As a consequence, fair condition meadows that are closely grazed provide poor brood rearing habitat.

The EIS area sage grouse wintering habitat has dense concentrations of sagebrush, especially the low growing varieties, that provide the twenty percent canopy cover needed for wintering sage grouse. Sagebrush also makes up almost 100 percent of the winter diet and approximately 50 percent of the spring, summer and fall diet (Patterson 1952).

Water distribution is not optimum for sage grouse in the EIS area. This limits grouse distribution in areas that would otherwise be suitable habitat.

Waterfowl

Four species of geese and eighteen species of ducks occur in the EIS area as resident or migratory species. Common nesting species are Canada geese, mallard, pintail, green-wing teal and cinnamon teal.

The Snake River and adjacent habitat is a major production area for Canada geese and ducks. The larger reservoirs and the Owyhee River contribute some additional goose production. Ducks nest adjacent to most reservoirs, stock ponds and major creeks in the EIS area. Although production is small at each of these sites, there are over 201 stock ponds and reservoirs in the EIS area.

In the spring waterfowl in the EIS area depend on adequate cover in the upland areas for nesting (Berg, 1956). Broods depend on emergent aquatic and shoreline vegetation for cover and food. Nesting and brood cover are generally in very poor condition in the vicinity of water due to the heavy utilization of these areas by livestock.

Meadow/Riparian Associated Wildlife

Meadow and riparian habitats are areas adjacent to a drainage or stream having plant species different from those of the surrounding, drier habitat zones. Riparian habitats are characterized by plant species such as cottonwood, aspen, maple, alder, willow, rose, currant, and many grasses and forbs. Meadows lack tree and shrub species but support many succulent forbs and grasses.

Livestock concentrate in meadow/riparian habitats due to the presence of water, green forage and in the case of riparian habitats, shade. In the EIS area, about 36 percent of the 421 public miles of major riparian habitats are severely impacted by livestock (Appendix Table K-1). Ninety percent of these habitats are in fair ecological condition (Appendix Table J-2); these overused areas exhibit lower vegetation diversity, limited tree and shrub canopy, a high occurrence of undesireable species (cockle burs, cheatgrass and mustards) and inadequate reproduction of desirable plants.

Most wildlife species in the EIS area use riparian habitats disportionately more than any habitat type available. The structural diversity offered by a tree layer, a shrub layer, and a herbaceous layer provides large amounts of nesting, roosting, hiding, escape and thermal cover for both high densities and many species of wildlife. Additionally, riparian vegetation provides many important food plants such as aspen, cottonwood, willow, maple, currant, rose, and grasses and forbs. Riparian vegetation remains green and nutritious longer than the surrounding upland vegetation.

Several important species closely associated with riparian zones include beaver, river otter, valley quail and mountain quail.

Beaver

Beaver are found in most major perennial creeks throughout the EIS area although populations are scattered and generally low. Remnant washed out dams and aspen stumps indicate beaver were once abundant.

Beaver depend upon the bark and twigs of riparian shrubs and trees for food. Although they are capable of harvesting trees and shrubs beyond the reach of livestock, this food source is limited if young plants are being suppressed by livestock and beaver.

River Otter

Native river otter are found throughout the EIS area's rivers and major perennial creeks. Otters are common in the Owyhee River system including major tributary creeks like Deep Creek and Battle Creek. Small or transient populations occur along the Snake River, Boulder, Jordan and Sinker creeks.

An adequate food supply (fish, frogs, crayfish, mollusks and insects) and den sites (burrows with underwater entrances) are two key habitat elements for this species. Livestock can affect both of these habitat elements. Depleted riparian zones provide lower amounts of potential prey and fewer beavers, whose vacated dens are used by otters.

Valley Quail

Native valley quail are common to abundant in the EIS area. Populations experience wide fluctuations which are closely associated to climatic variation.

Although climate is an important factor controlling quail populations, habitat condition influences their ability to endure climatic variation (Edminster 1954). A good interspersion of shrubby and herbaceous vegetation in association with water is essential to the maintenance of good populations. Concentrated use of these habitats by livestock conflicts with the needs of the quail and does not permit optimum population development.

Mountain Quail

Populations of mountain quail are scattered and quite small in the EIS area. Sources indicate they were very common in the early 1900s and still common in the northern foothills of the EIS area in the 1950s (Burleigh 1972). Because of low numbers now existing, this species has been classified as a "sensitive species" by BLM and the Idaho Fish and Game Department.

The habitat requirements of mountain quail are little known. In arid areas they are associated with riparian habitats located in the bottom of canyons or steep slopes. The concentration of cattle in the riparian habitats may be a significant factor affecting the welfare of these birds.

AQUATIC WILDLIFE

Introduction

There are 27 perennial and fifteen major intermittent streams which contain fisheries habitat in the EIS area (Map 2-2). Fifty-five percent of the 575 miles of perennial streams and 59 percent of the 178 miles of major intermittent streams in the EIS area are on public lands.

Since the Snake River and the lower portions of its tributaries within the EIS area are predominantly surrounded by private lands (90 percent), discussion of the Snake River will be limited throughout this EIS.

Inventory of EIS streams was conducted each field season (May-November) from 1976-1978. Inventory methods and analyses used to generate information in this EIS are contained in Appendix K.

Fisheries Habitat Condition

Fisheries habitat condition on each stream mile of public land administered by BLM was evaluated based on the following physical factors: (1) high streambank cover (percent shading), (2) low streambank cover (percent bare soil), (3) streambank stability, (4) stream channel stability (5) amount of sedimentation and (6) in-stream cover. Many of these factors are related to vegetative cover which is a key factor to good fisheries habitat condition in desert streams. Criteria for excellent, good, fair and poor condition rating for each of these six factors is contained in Appendix K. Of the 316.7 miles of perennial stream on public lands, 141.6 miles are rated in poor condition, 125.1 miles are rated in fair condition and 50 miles rated in good condition. Of the 104.9 miles of major intermittent stream, approximately two-thirds of this mileage is rated in poor condition and the remaining one-third rated in fair condition (Map 2-2).

Livestock grazing is a major conflicting activity to overall good fisheries physical habitat condition in EIS streams (Appendix Table K-3). The major physical habitat limiting factor in EIS streams is silt. Other physical habitat limiting factors in many EIS streams include, unstable banks and lack of cover, water depth, and pools. In conjunction with the physical habitat condition rating of each stream mile on public lands, pellet transects were run along streamside areas and the intensity of cattle use in streamside areas was calculated for each stream area rated. Stream areas with moderate to high degrees of cattle grazing onsite impacts to fisheries physical habitat condition are shown on Map 2-2 and listed by EIS stream in Appendix Table K-1. Based on the pellets transects, use by other ungulate species was negligible on stream areas impacted by cattle. Actual cattle use on stream areas with serious onsite cattle grazing conflicts were, on the average, 50 times higher than the allotment stocking rates (Appendix Table K-1).

Of the 316.7 miles of perennial stream on public lands, 93.6 miles were rated as having a high degree of cattle grazing onsite conflict with fisheries habitat condition and 22.4 miles were rated as having a moderate degree of cattle grazing onsite conflict with fisheries habitat condition. Of the 62 major intermittent stream miles inventoried for amount of ungulate use, nineteen miles were rated as having a high degree of onsite cattle grazing conflict with fisheries and 16.7 miles had a moderate degree of onsite cattle grazing conflict with fisheries.

Stream hydrology factors in poor to fair condition are presented by EIS stream mileage in Appendix Table K-2. Of the 337 miles of perennial and major intermittent streams with serious silt problems, 153 stream miles are associated with serious onsite cattle grazing impacts (Appendix Table K-3). The remaining 184 stream miles could be associated with overland erosion, upstream erosion, other nongrazing impacts, and/or less serious onsite grazing impacts not identified in the above 153 stream miles.

Water Quality and Water Quantity

The predominant water quality limiting factor to EIS trout fishery streams appears to be water temperature. Of the 42 perennial and major intermittent EIS streams, 26 have summer temperatures above 65 degrees Fahrenheit, a threshold water temperature for most trout populations. Although redband trout have been reported in streams with summer water temperatures in the 80-85 degree Fahrenheit range, it is not known to what extent this may affect growth, vigor, behavior, reproduction, and mortality of stream populations.

The other major water quality problem on 80 percent of the EIS stream mileage (421 miles) is siltation. Adverse impacts of siltation upon aquatic fauna are extensive (Pistono 1978). Other potentially limiting water quality factors which were present in at least 20 percent of the 42 EIS streams included phosphates, percent O_2 saturation, pH, alkalinity and nitrates (Appendix Table K-4). Lack of water quantity and adequate flows by mid-summer in the EIS major intermittent streams, and in 21 of the 27 perennial EIS streams, also add to the water quality problems identified. The direct adverse effects on the existing fishery are another consideration. These factors could affect fish populations by any of the means already listed, depending on the interaction of physical and chemical components within each stream area. Many of the water quality factors identified are affected by changes in streambank vegetative cover. Overall, based on chemical water quality, water temperature, siltation levels, and water quantity needed to meet trout fishery requirements, 57 percent of the 42 EIS streams are rated as poor and 43 percent of the 42 streams are rated fair.

Aquatic Macro-Invertebrates

Aquatic macro-invertebrates are used as indicators of water quality, stream community richness and stability, and as an indication of the amount of food available to fish species.

At least 153 species of aquatic macro-invertebrates, representing a broad spectrum of habitat preference types, are found in the EIS area. In general, stoneflies, mayflies, and to a lesser extent, caddisflies, are the major aquatic insect orders associated with good water quality.

The two-winged flies, snails, dragonflies, damselflies, and some families of beetles are thought to be more tolerant to some forms of water pollution than other aquatic macro-invertebrates. Information on the distribution and relative abundance of aquatic macro-invertebrate species in the EIS area is available from the Boise district office, BLM.

Caddisflies are the most abundant organisms in 25 of 46 EIS sample sites. Two-winged flies and mayflies are the most abundant organisms in eleven and eight EIS stream sites, respectively (Appendix Table K-5). Almost half of the 42 EIS streams are rated as having fair community richness based on species diversity (Appendix K). Of the 42 streams, seventeen percent are rated as good and 38 percent are rated as having poor community richness (Appendix Table K-5). A combination of aquatic macro-invertebrates and the community richness indicates that three-fourths of EIS stream sites have an overall fair water quality rating for aquatic macro-invertebrates, one-sixth of the sites have an overall poor water quality rating for macro-invertebrates, and the remaining one-twelfth of the sites have good water quality for macro-invertebrates.

A rating system (Appendix K) based on the total number of aquatic macro-invertebrates per square foot (Binns 1976) in conjunction with the dry weight biomass of aquatic macro-invertebrates per square foot, is used to evaluate overall fish food abundance in EIS streams. Over half of the 42 EIS streams are rated as fair with one-fourth of the 42 streams rated poor, and the remaining one-sixth rated good.

Fish Populations

There are 26 species of fish inhabiting the EIS area; thirteen are game species. Two of the game species are "sensitive" species; white sturgeon, which inhabit the Snake River, and native redband trout which are distributed throughout the EIS area. A "sensitive" species is a designation by the BLM and the Idaho Department of Fish and Game. It is defined as a species having a limited population or habitat distribution in the state or that could be listed nationally as Threatened or Endangered should its habitat or population continue to decline.

The Snake River provides a significant warm water game fishery to the public whereas streams in the remainder of the EIS area support a cold water game fishery of redband trout or a warmwater nongame fishery.

The most common and widespread species in the EIS area include (in decreasing order of miles of habitat occupied) speckled dace, largescale sucker, redband trout, redside shiner and chiselmouth (Appendix Table K-5). Redband trout are present in most streams, inhabiting 23 of the 27 perennial streams and seven of the fifteen major intermittent streams.

Redband trout, speckled dace, and largescale suckers are the most abundant species in EIS streams (Appendix Table K-6).

Population and biomass estimates of redband trout per surface-acre were generated using Seber-LeCren's (1968) two-catch release method.

Redband trout population estimates among EIS streams ranged from 30 to 2,675 per surface-acre, with a mean stream value of 758 per surface-acre. Biomass estimates among EIS streams ranged from 2 to 175 pounds per surface-acre with a mean stream value of 35 pounds per surface-acre (Appendix Table K-7). Based on fisheries inventory information (Appendix K, Appendix Table K-7 and Appendix Table K-8), overall present numbers and biomass of redband trout in the EIS area are estimated at 76,000 and 4,000 pounds respectively.

Redband trout in EIS streams are rarely over nine inches in length with average adult sizes of five to seven inches in length (Appendix Table K-7).

WILD HORSES

Approximately 324 wild horses are located in the northern portion of the EIS area (Map 3-8). The Owyhee Mountain wild horse herd increased from 118 head in 1971 (when they were first inventoried following passage of the Wild and Free Roaming Horse and Burro Act) to 421 head in 1978. This caused a significant increase in forage (3,636 AUMs) needed to sustain the herd which had increased approximately 25 percent per year. A management and gathering plan was written and approved in 1978 for the Owyhee wild horse herd. This plan recommends managing the herd numbers based upon the 1971 aerial inventory of 118, with maximum horse numbers of 178 (or 150 percent increase in each allotment above herd base).

The Owyhee Mountain wild horse herd presently occupies six allotments (Table 3-5). By the time the first horses were gathered in 1978, they had spread into the Rockville, French John and Blackstock Springs allotments (Table 3-5).

Table 3-5
Wild Horse Numbers

Allot. No.	Allotments	1971	1978	1979	1980	Proposed Max. Level
517	Black Mountain	30	73	98	124	45
508	Reynolds Creek	36	53	43	33	54
516	River Group	17	120	13	26	26
522	Rats Nest	7	27	11	14	11
556	Shares Basin	6	43	7	29	9
521	Sands Basin	22	48	86	93	33
565	Rockville	0	8	0	5	0
518	French John	0	6	0	0	0
515	Blackstock Springs	0	43	0	0	0
	TOTAL	118*	421*	258*	324*	178

* Determined through aerial inventory (helicopter and fixed-wing)

The herd area, containing 120,000 acres or approximately twelve percent of the EIS area, is divided into numerous pastures. The horses do not have specific areas of use by season, however they move to the low elevation of the pastures in the winter and follow the greenup to the higher elevations as the season progresses. No foaling areas are identified. The horses tend to move to the higher ridges in mid-summer to escape flies and take advantage of the breeze.

The overall condition of the horses is very good, considering the age of the older horses. The horses gathered in 1978 were "wormy" which may account for the older horses being in poor flesh. The Black Mountain and Sands Basin herds are large enough that, unless some are gathered, the horses will not winter well. This would cause reduced colt production and survival, a higher mortality of the older horses and accelerated decreased range condition. The total production in the allotment will not provide adequate forage for the horses. With livestock and wildlife use taken off, the winter feed supply for the horses would still be deficient.

Major problems in the herd area are the number of fences and the horses getting into "unauthorized" areas such as private fields or BLM pastures which did not have horses when the Wild Horse and Burro Act was passed. In the Black Mountain allotment, the horses in pasture 517-1 and 2 are disturbed by recreational use. The free movement of horses in the different allotments is complicated where the AMP's have been initiated. In the fall and winter months, the gates are left open and the horses can move freely throughout the allotment. In spring, summer and early fall, the gates between pastures are closed and the free movement is restricted. Although this is a disadvantage in the spring-fall period, once the pasture fences are opened, the horses are free to winter in the rest pasture of the grazing system.

CULTURAL RESOURCES

Cultural resource sites in the EIS area which have been accepted to the National Register of Historic Places include the Silver City, Delamar and Guffey-Black Butte archaeological districts. These are not presently being impacted by livestock grazing.

Cultural resource sites in the EIS area are in relatively good condition. Of 503 known sites (historic and prehistoric), 63 sites or 12.5 percent of the total are deteriorating or have been destroyed by trampling.

Prehistoric sites suffering from trampling include quarrys, rock shelters, temporary campsites, long term habitation sites and lithic scatters.

One historic site is presently being adversely impacted by livestock trampling.

Damage to cultural resource sites from trampling is often intensified by accompanying erosion. Presently, twenty prehistoric sites and one historic site are deteriorating from erosion and, of these, five prehistoric sites (one percent of the total) are deteriorating from the combination of trampling and erosion.

Table 3-6 summarizes the present impacts occurring on known cultural resource sites. Appendix I describes inventory procedures and site diveristy.

Table 3-6
Present Impacts to Known Cultural Resource Sites

Impacting Agent	Historic Sites	Prehistoric Sites: Rock Shelter	Quarry	Chipping Station	Habitation Site	Isolated Find	Petroglyph	Rock Alignment
Trampling	1	--	1	54	7	--	--	--
Erosion	1	--	--	15	5	--	--	--
Other*	19	67	17	196	52	62	5	6

* Nongrazing related impacts.

WILDERNESS

The wilderness inventory process has been completed in accordance with Sec. 603(c) of FLPMA and subsequent bureau directives, and nine Wilderness Study Areas (WSAs) have been identified (Map 3-9). Two of these were identified in the Agricultural Environmental Statement in July 1979; the remaining seven areas were identified during an intensive inventory of 22 potential WSAs, finalized in January 1980. The qualifying areas possess wilderness characteristics of adequate size, naturalness and outstanding opportunities for solitude or primitive recreation. Wilderness Study Areas will be evaluated through bureau planning procedures to determine their suitability or nonsuitability for preservation as wilderness.

A portion of one additional potential WSA, Lower Owyhee River, lies in the EIS area. A decision on this area has been deferred until a joint recommendation concerning contiguous roadless land in Oregon can be determined.

An 11,365 acre portion of the Birds of Prey Instant Study Area (ISA) is also located in the EIS area. The ISA has been found to lack wilderness characteristics. This will be reported to Congress, which has final responsibility for a decision on the area. Interim management guidelines will apply until Congress acts on this area.

Table 3-7 lists potential wilderness areas and affected grazing allotments.

Table 3-7
Potential Wilderness Areas 1/

Unit #.	Unit Name	Wilderness Study Area Acres	Other Potential Wilderness Acres	Allotments Affected
16-2	Jump Creek 2/	8,301		0514,0603
16-9	Reynolds Creek Canyon 2/	14,650		0508, 0517 0616
16-40	North Fork Owyhee River	55,147		0454, 4070, 0459, 0501, 0520, 0539, 0546, 0548, 0599
16-41	Horsehead Spring	6,211		0539
16-42	Squaw Creek Canyon	11,379		0539, 0611
16-44	Deep Creek 3/	1,181		0548,0550
16-45	Middle Fork Owyhee River	13,336		0539, 0540
16-47	West Fork Red Canyon	14,710		0539, 0540
16-49A	Deep Creek-Owyhee River 3/	29,192		0539,0540 0551,0593
16-48B	Lower Owyhee River 3/, 4/		13,700	0540
	Birds of Prey Instant Study Area 3/, 5/		11,365	0517, 0535 0571,0578
	TOTAL	154,107	25,065	

1/ For a description of wilderness characteristics in each unit, see "Wilderness Intensive Inventory: Final Decision, Owyhee Planning Unit."
2/ Identified during Agricultural ES and subject to administrative review until Sept. 30, 1980.
3/ Contiguous to potential wilderness outside Owyhee Grazing EIS area.
4/ Decision on WSA status deferred due to contiguous Oregon area.
5/ Area not recommended for wilderness but congressional action necessary.

VISUAL RESOURCES

Introduction

The character of a landscape is determined by features that are seen and their arrangement in the landscape composition. Features can be divided into three categories: land and water surface, vegetation, and structures. Four basic elements define a particular feature: form, line, color, and texture. These are the major elements perceived in any visual composition, and are the basic tools for managing the visual resources.

The Owyhee EIS area is contained in the Snake River Plain which stretches across Idaho and into Oregon. The Visual Resource Management System compares each area to the whole region, to determine scenic quality.

Most visitors view the landscape from road and river corridors, but some view the area from dispersed points. VRM classes are tied to distance zones and viewer sensitivity. Areas within five miles of major travel corridors are considered foreground, and areas beyond fifteen miles are seldom seen. If significant numbers of travelers are primarily seeking recreation and sightseeing, these foreground areas are mapped as having high sensitivity.

Visual Resource Management Classes

The classes are determined by rating the area's scenic beauty, accessibility and sensitivity. This system is described in BLM Manual 8400.

There are five VRM classes based on scenic quality, accessibility and sensitivity. Map 3-10 shows the VRM classes overlaid with the scenic quality map used to develop those classes.

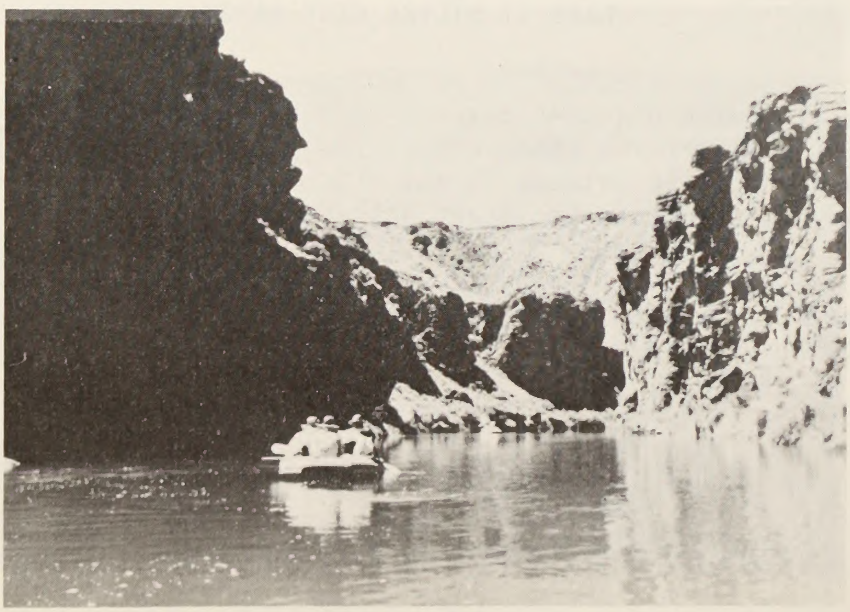


Figure 3-1
CLASS I OWYHEE CANYON

Class I covers 3.7 percent of the Owyhee study area. This class provides primarily for natural ecological changes; however, it does not preclude very limited management activity. Any contrast created within the characteristic environment must not attract attention. It includes sections of the Oregon Trail and Birds of Prey Natural Area. The wild Owyhee Canyon is also Class I. In addition to these areas, all wilderness study areas (Map 3-9) have Class I interim management which would be retained by all areas receiving final wilderness designation. This accounts for 17.3 percent of the area overlapping VRM Classes I through IV.

Figure 3-2
CLASS II SILVER CITY RANGE

Class II covers eighteen percent of the area. Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the characteristic landscape. A contrast may be seen but should not attract attention.

There are six Class II areas. These include; Jump Creek, Silver City Mountains, South Mountain area, Boulder Creek, North Fork Owyhee and the Middle Fork Owyhee River.

Figure 3-3
CLASS III SINKER CREEK

Class III covers 12.5 percent of the area. Contrasts to the basic elements (form, line, color, texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape. However, the changes should remain subordinate to the existing characteristic landscape.

The largest areas of Class III management lie along major roads. These roads include; U.S. 95 and State Route 45, Flint Creek road, Mud Flat road and Reynolds Creek road.

Figure 3-4
CLASS IV COW CREEK ON OREGON-IDAHO LINE

Class IV covers 66 percent of the area. Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, texture) inherent in the characteristic landscape.

Class V covers less than one percent of the area. These areas need change to bring back visual character which was destroyed by unacceptable cultural modification such as removing vegetation and topsoil, or adding trash and junk cars. Class V areas are currently being designated in the Owyhee area.

RECREATION

Major Recreation Values

Public lands within the area play an important role in providing a diverse choice of recreation opportunities. Those recreation opportunities significantly impacted by the proposed action include off-road vehicle use, hunting, and fishing (Map 3-11).

From information obtained from the Idaho Department of Fish and Game and from the 1977 Idaho Outdoor Recreation Plan (SCORP) prepared by the Idaho Department of Parks and Recreation, existing levels of recreation use were estimated. The appraisals of hunting and fishing use made by the Idaho Department of Fish and Game are fairly accurate, while off-road vehicle use is actually a recreation demand estimate for the EIS areas formulated by the Idaho Department of Parks and Recreation and may not represent actual use; however, no other information was available.

Existing recreation use is experiencing upward trends. Projected levels of recreation use were based on information contained in the SCORP which estimated that overall recreation use will increase 75 percent between 1980 and 2000. Use is shown in activity occasions, which is defined as participation by one person in one activity for all or part of one day.

Table 3-8
Existing and Projected Recreation Use

	1980	2000
Off-Road Vehicle	175,000	300,000
Hunting	97,585	140,000
Fishing	724	1,100
TOTAL	273,309 activity occasions	441,100 activity occasions

Fishing estimates do not include use of the Snake River since the proposed action would not affect this fishery.

Off-Road Vehicle Use

Opportunities to operate motorcycles and four-wheel drive vehicles are found throughout the area except in steep canyon areas and on private land. There are miles of primitive roads and trails which provide almost limitless opportunities for riding and areas suitable for cross-country travel off roads and trails. The most heavily used areas are near Marsing and Murphy. The bureau has proposed that ORV parks be established in the heavy use areas. In the winter, the higher elevations are used for snowmobiling; most use being concentrated in the Owyhee Mountains around Silver City.

Heavy brush restricts cross-country ORV use in some otherwise suitable areas, and fences act as barriers to ORV use.

Hunting

The area provides valuable hunting opportunities. The Idaho Department of Fish and Game estimates that existing hunting use is 97,585 activity occasions. This is broken down as follows: big game 9,085; upland game 63,792; small game 1,400; and waterfowl 23,308 activity occasions.

The 1977 Idaho Outdoor Recreation Plan estimates that hunting use will increase 56 percent between 1980 and 2000. If increased hunting use is not matched by increases in populations of game animals, success ratios or the quality of the experience will diminish.

Fishing

Rivers, creeks, and reservoirs provide habitat for game fish. The Snake River yields a significant warm-water fishery, while the remainder of the area supports mostly a cold-water game fishery. Angler use of trout streams is moderate in areas close to towns and low in the remote areas. The Idaho Department of Fish and Game estimates that existing fishing use is 10,724 activity occasions, of which 10,000 occurred on the Snake River.

LIVESTOCK GRAZING

Within the Owyhee EIS area 83 operators are permitted in 111 allotments; 32 private fields containing fenced federal range are not licensed. Of the licensed allotments, eight are grazed by cattle, horses and sheep; three are grazed by cattle and sheep; ten are grazed by cattle and horses; and 94 are grazed by cattle. There are eleven allotments trailed through by sheep, and one allotment grazed by sheep.

Two major types of livestock operations occur within the EIS area: cow-calf and ewe-lamb. The majority of the cattle permits are part of a cow-calf operation, consisting of a base breeding herd of cows and bulls. Some operators have not established a breeding season, and bulls and cows are together yearlong. Birth and weaning of calves may occur at all times of the year, but most calves are born August through December. The size of the cattle operation is highly variable.

The two sheep operators use the allotments from mid-March to about mid-December. The sheep are then herded back to private land. Their herd size is about 6,000 sheep each.

Livestock winter on feed cut from hay meadows and on the hay aftermath left standing in the fields. Most livestock are then turned out on public lands in April. Grazing continues through September and some as late as February. During April through February, the livestock may also graze private and state lands. The livestock are returned to the hay meadows for the fall and winter to complete the years grazing cycle. Existing grazing use by allotment is shown on Appendix Table C-8.

For the Owyhee EIS area, the existing active grazing qualification on public lands is 113,122 AUMs. However, a five-year average (1974 through 1978) of past licensed use was 105,009 AUMs, which is 93 percent of active grazing qualifications (Appendix Table C-8). Of the total grazing use on public land, 96 percent is by cattle and four percent is by sheep. Grazing use by horses make up less than one percent of the total.

ECONOMICS

Rancher Income

For economic analysis, the 83 permit holders in the EIS area have been divided into subgroups by their herd size.

Size Group	Herd Size	Number of Permittees
1	0-149 cattle	18
2	150-399 cattle	29
3	400 + cattle	36

Ranch budgets were collected for each size group. These budgets (Table 3-9) form the base against which changes in AUM levels in Chapter 4 will be analyzed. For a complete description of how the budgets were collected see Appendix L. Due to the small number of sheep operations sheep operations in the EIS area, a seperate sheep budget was not collected. The number of sheep have been converted to cattle equivalents on a ratio of five sheep to one cow and these operations included in the appropriate size group. The total AUMs in the various size groups are:

Group	Active Preference	Licensed Use (5-Year Averge)
1	7,599	7,592
2	22,284	22,584
3	83,239	74,833
TOTAL	113,122	105,009

Table C-9

Owyhee EIS Area Ranch Budget Group 1

Revenues	
Calf and Yearling Sales	$ 30,529
Cull Cow and Bull Sales	5,838
Other Ranch Receipts	6,067
Gross Revenue	$ 39,100
Cash Expenses	
Land Rent	$ 217
Feed	4,500
Veterinary	820
Livestock Purchased	6,619
Insurance	793
Marketing and Transportation	822
Labor	1,732
Taxes	1,866
Seed and Fertilizer	111
Machine Operating Expenses	1,329
Repairs	468
Utilities	515
Grazing Fees	1,653
Supplies	409
Miscellaneous	1,296
Interest	1,607
Total Cash Expenses	$ 24,757
Net Cash Ranch Income	$ 14,343
Change in Inventory	$ 496
Estimated Prerequisites	515
Depreciation	-2,293
Net Ranch Income	$ 13,061
Off-Ranch Income	3,333
Net Family Income	$ 16,394

Owyhee EIS Area Ranch Budget Group 2

Revenues	
Calf and Yearling Sales	$ 50,350
Cull Cow and Bull Sales	6,345
Other Ranch Receipts	1,600
Gross Revenue	$ 58,295
Cash Expenses	
Land Rent	$ 2,350
Feed	5,353
Veterinary	1,234
Livestock Purchased	31,050
Insurance	1,082
Marketing and Transportation	852
Labor	1,393
Taxes	2,560
Seed and Fertilizer	1,409
Machine Operating Expenses	3,236
Repairs	3,258
Utilities	571
Grazing Fees	3,904
Supplies	1,954
Miscellaneous	628
Interest	7,859
Total Cash Expenses	$ 68,693
Net Cash Ranch Income	$-10,398
Change in Inventory	39,742
Estimated Prerequisites	524
Depreciation	-4,263
Net Ranch Income	$ 25,497
Off-Ranch Income	108
Net Family Income	$ 25,605

Owyhee EIS Area Ranch Budget Group 3

Revenues	
Calf and Yearling Sales	$174,774
Cull Cow and Bull Sales	23,810
Other Ranch Receipts	11,433
Gross Revenue	$210,017
Cash Expenses	
Land Rent	$ 8,333
Feed	24,446
Veterinary	2,785
Livestock Purchased	9,262
Insurance	2,025
Marketing and Transportation	842
Labor	29,408
Taxes	2,915
Seed and Fertilizer	8,808
Machine Operating Expenses	6,995
Repairs	8,355
Utilities	8,110
Grazing Fees	9,612
Supplies	7,104
Miscellaneous	1,907
Interest	13,276
Total Cash Expenses	$144,183
Net Cash Ranch Income	65,834
Change in Inventory	500
Estimated Prerequisites	385
Depreciation	- 18,726
Net Ranch Income	$ 47,993
Off-Ranch Income	1,200
Net Family Income	$ 49,193

This shows the permittees in the EIS area have been using 93 percent of their total active preference demand. Future analysis will be based on the five-year average since that is the number of AUMs the permittees have been using.

Draft budgets prepared by the Economics Statistics, and Cooperative Service (ESCS) of the U.S. Department of Agriculture are presented in Appendix L for comparison purposes. These budgets were not used in this draft EIS since the budgets were not received in time for incorporation into the analysis and have not received rancher input for verification of their accuracy.

Regional Income

The 83 permit holders in the EIS area reside primarily in western Owyhee County, Idaho, eastern Malheur County, Oregon (vicinity of Jordan Valley, OR), and in northern Owyhee County (Homedale, Marsing, Grandview, Murphy, etc.). Some permittees reside in Ada and Canyon counties in Idaho. For these reasons, and identified shopping patterns, the counties of Canyon and Owyhee in Idaho and Malheur in Oregon have been established as the economic trade area or region which will be analyzed in this EIS. Ada County was not included since few permittees live in that county, little trade activity was identified with the county, and the county's large metropolitan area would distort the data being analyzed.

The total personal income in the three-county trade area was $437 million in 1977. Farm income accounted for $27 million, or 6.2 percent, of that total. The largest industries are manufacturing ($106 million), services ($69 million), retail trade ($57 million), and government enterprises ($57 million). See Table 3-10 for data on the individual counties and other industries. Between 1972 and 1977 the total personal income increased by $30 million (adjusted for inflation). During the same period, farm income has decreased by $47 million (Bureau of Economic Analysis 1979). See Appendix L for the methodology used to account for inflation.

Employment

Total 1977 employment in the trade region was 52,513. Total farm employment was 10,491 or 20 percent of the total. Other major employers are manufacturing (18 percent), retail trade (13 percent), and government (13 percent). See Table 3-11 for data on the individual counties and other industries.

Between 1972 and 1977 total employment increased by 21 percent (from 43,535).

During this same period farm employment increased fourteen percent (from 9,172) (Bureau of Economic Analysis 1979).

Ranch Consolidation

Recent sales of ranches in the Owyhee EIS area have been made generally to other ranchers and often to ranchers already in the EIS

Table 3-10
Personal Income ($000's)
1977 1/
Owyhee EIS Trade Area

Industry	Canyon	Owyhee	Malheur	Total
Total	309,018	18,314	109,926	437,258
Farm	19,081	1,699	6,348	27,128
Non-Farm	289,937	16,615	103,578	410,130
Private	258,438	12,605	82,070	353,113
Ag. Serv., For 2/	(D)	631	2,753	---
Mining	(D)	2,658	68	---
Construction	22,201	1,492	5,466	29,159
Manufacturing	84,440	1,746	19,654	105,840
Non-Durable	54,770	(D)	17,477	---
Durable	29,670	(D)	2,177	---
Trans., Public Utilities	24,855	1,463	7,290	33,608
Wholesale Trade	24,047	1,013	8,332	33,392
Retail Trade	38,019	2,044	17,177	57,240
Financial Insurance Real Estate	10,511	450	3,249	14,210
Services	49,861	1,108	18,081	69,050
Gov't & Gov't Ent.	31,499	4,010	21,508	57,017
Federal, Civilian	3,138	1,116	3,594	7,848
Federal, Military	1,345	124	406	1,875
State & Local	27,016	2,770	17,508	47,294

1/ Estimates based on 1972 Standard Industrial Classification.

2/ Includes wages and salaries of U.S. residents working for international organizations.

(D) Not shown to avoid disclosure of confidential information. Data are included in the totals.

Source: U.S. Department of Commerce, April 1979. Regional Economics Information System Bureau of Economic Analysis.

Table 3-11
Owyhee EIS Trade Area
Employment
1977 1/

Industry	Canyon	Owyhee	Malheur	Total
Total Employment 2/	34,458	3,262	14,793	52,513
Number of Proprietors	5,030	891	2,654	8,575
Farm Proprietors	2,388	634	1,718	4,740
Non-Farm Proprietors	2,642	275	936	3,853
Total Wage and Salary	29,428	2,371	12,139	43,938
Farm	2,807	798	2,146	5,751
Non-Farm	26,621	1,573	9,993	38,187
Private	22,547	1,053	7,541	31,141
Ag. Serv. For 3/	(D)	87	320	---
Mining	(D)	160	(L)	---
Construction	1,174	70	322	1,566
Manufacturing	7,221	174	1,790	9,185
Non-Durable	4,539	(D)	1,664	---
Durable	2,682	(D)	126	---
Trans., Public Utilities	1,488	87	426	2,001
Wholesale Trade	2,059	88	783	2,930
Retail Trade	4,379	218	2,000	6,597
Financial Insurance Real Estate	762	36	245	1,043
Services	4,823	133	1,647	6,603
Gov't & Gov't Ent.	4,074	520	2,452	7,046
Federal, Civilian	199	80	228	507
Federal, Military	520	53	135	708
State and Local	3,355	387	2,089	5,831

1/ Estimates Based on 1972 Standard Industrial Classification.

2/ Consists of wage and salary jobs plus number of proprietors.

3/ Includes number of jobs held by U.S. residents working for international organizations.

(D) Not shown to avoid disclosure of confidential information. Data are included in totals.

(L) Less than ten wage and salary jobs.

Source: U.S. Department of Commerce, April 1979. Regional Economics Information System; Bureau of Economic Analysis.

area. The result has been a general trend towards larger ranches with no change in the county tax base and unknown, although believed minimal, changes in ranch employment. Presently ranches are not being sold for recreation or ranchette-type subdivisions.

Capital Position

As early as 1925, it was recognized that the annual value of the federal grazing privilege was being capitalized into rancher property.

> "It is argued that long use of the range in connection with the early settlement of agricultural lands has resulted in capitalizing the values of public pasturage as part of the value of the ranch; ..." (U.S.D.A. 1925).

A report published by the Utah State University Experiment Station stated "there was nothing illegal or unethical in the fact that grazing permits took on a value; ranchers just reacted to an economic situation that was created by government policy. Permit values rose because ranchers who had grazing permits were capturing economic rents in the form of low cost grazing; i.e., the grazing fee and recognized non-fee costs did not equal the value of the grazing to ranchers. Thus, the authorization to use the federal lands and the associated economic cents were capitalized into rancher-owned assets. This value could show up either as a permit value or as an increased value of the commensurate property" (Nielson 1971).

Although the BLM does not recognize this capitalized value of grazing permits, it is known that permits have sold at prices ranging from $25 to $55 per AUM in southern Idaho (Federal Land Bank 1979, Production Credit Association 1979, Farm Home Administration 1979, personal communication).

SOCIAL CONDITIONS

Introduction

Conflicts related to public land and grazing management are common. Existing grazing allocations are favorably viewed by members of the community whose economic livelihood and security are derived from cattle or ranching operations, but are seen as potentially harmful by those whose primary interest is aesthetics or recreation. These kinds of conflicts are likely to become more intense in the study area as it continues to experience growing popularity as a recreation area.

Unstructured interviews were conducted within the Owyhee Resource Area to identify attitudes and values which may be affected by BLM actions. The 52 respondents interviewed represented mining, ranching, recreation, wildlife, local business and local elected officials.

The respondents did not answer specific questions but were encouraged to discuss issues of concern to them. The small sample size and method of data collection does not permit precise determination of the extent to which specific values are held by the community. Rather, the objective was to illustrate which values, related to multiple use management of the area, appear to be shaped by many people and which are likely to clash with possible BLM actions. A technical report containing a detailed description of the methodology and limitations of the social analysis is available in the Idaho State Office in Boise and the Boise district office of BLM.

General social values are expressed through satisfaction with community and neighborhood, educational facilities, health services, economic climate, recreation opportunities, religious institutions, etc. One major consideration is the way a person perceives his/her social situation as a reality to that individual. This perception, if it is positive, provides a "sense" of social well-being. An example would be satisfaction with living on a ranch provides a sense of social well-being for those who enjoy it, but a feeling of isolation for a person who did not like ranching. Both perceptions are a reality to the individuals involved, even though they are opposite. Another consideration is a sense of economic well-being. Perceived economic well-being seems to fall in two distinct categories: (1) those whose economic livelihood is derived from ranchrelated activities, or (2) those who derive their livelihood from nonranch related activities. Attitudes of individuals whose perceived economic well-being can be substantially changed by BLM decisions are understandably uneasy and do not have a strong feeling of contentment.

Social Values and Attitudes

A ranching lifestyle has been described by some as "one which will help very few people to become rich but is a family-oriented lifestyle which provides a good quality of life for those who choose it." In the 1970s, with high expenses and low beef prices, ranchers have faced economic and social pressures which could bring about changes in the industry. Economists (Martin 1968, Schultz 1970) think the livestock industry lags behind other sectors of American agriculture in areas of managerial efficiency and acceptance of innovation. Ranchers tend to make decisions based on noneconomic motives, such as maintaining a way of life. High profit is frequently not their primary goal (Schultz 1970). It would appear that maintaining the ranching way of life is more important than maximizing profits (Martin 1968).

Shultz found that 86 percent of his sample of western livestock operators viewed ranching as a way of life rather than a profit making enterprise. Further, it was felt that rural living was superior in virtually every respect to living in an urban area. He also found that "many ranchers perceive few if any benefits from participation in formally structured social groups". The ranchers in the Schultz study indicated (98 percent) they are virtually the only remaining industry free of government intervention, and as a group desire no federal subsidies. In addition, "95 percent" also felt they possessed particular qualities which differentiated them from members of other occupational groups, and such qualities were essential to securing social acceptance among other ranchers. Examples of these being: honesty, being hospitable, respectful of the rights of others etc.

The ranchers interviewed in the Owyhee Resource Area displayed many of the qualities found by Martin and Schultz. They felt that ranching is becoming more complex. Beside technology and inflation, governmental regulations were cited as one of the major reasons for this complexity. The ranchers do not favor government involvement in the ranching industry.

Regarding the general future of ranching, most respondents were guardedly optimistic depending on beef prices, availability of credit and the future of existing grazing permits in terms of BLM multiple use management decisions.

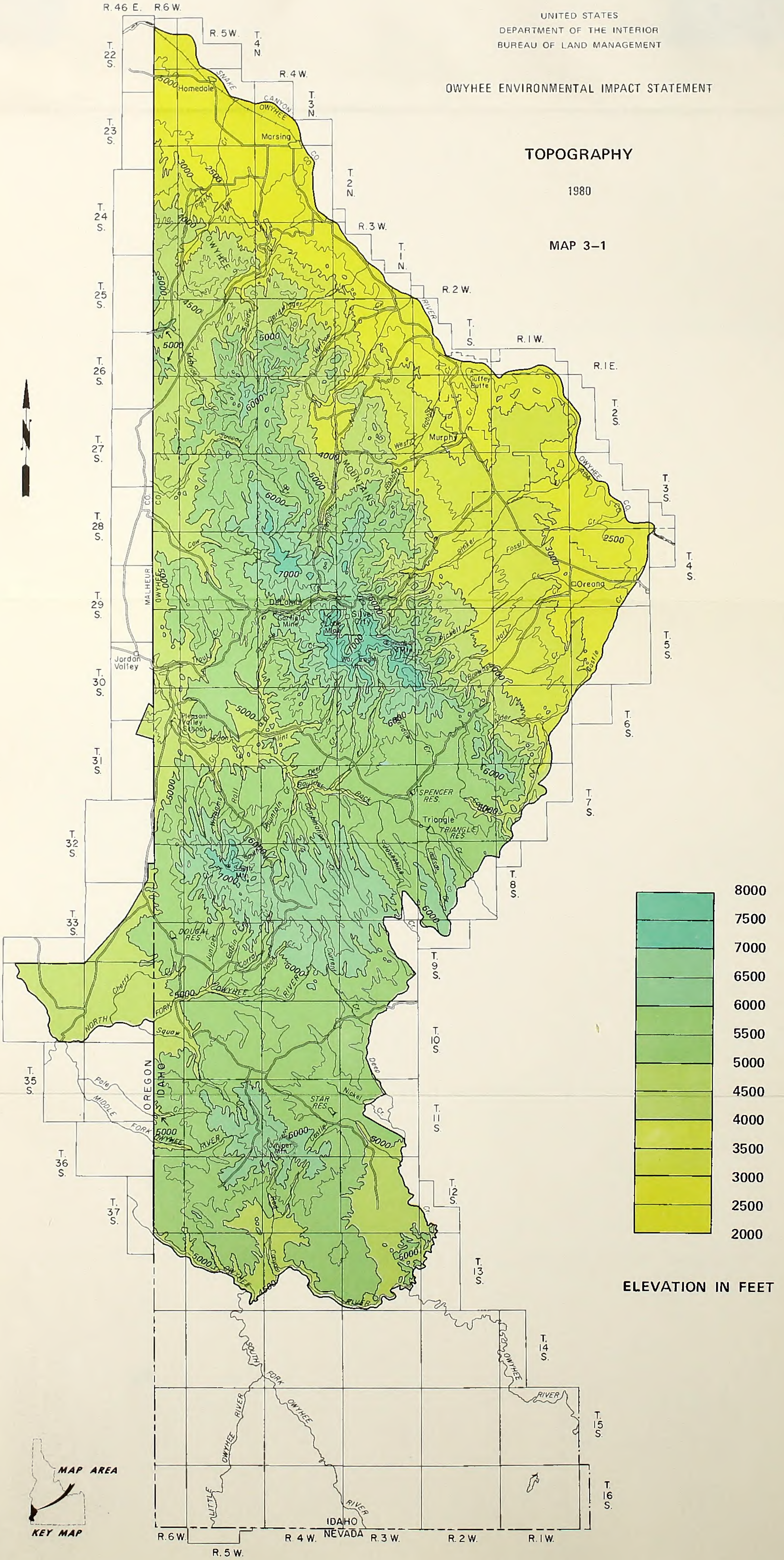
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OWYHEE ENVIRONMENTAL IMPACT STATEMENT

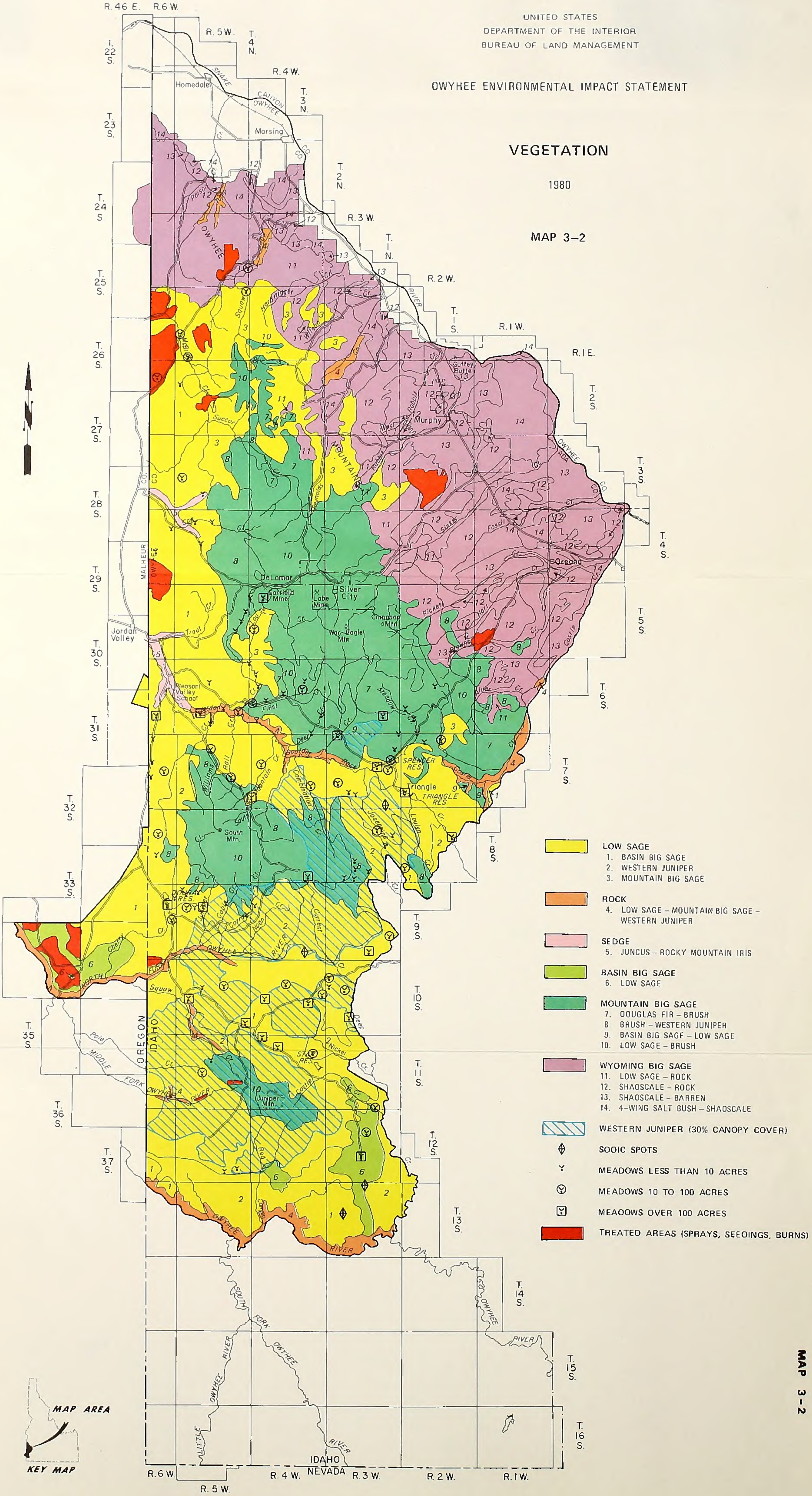
TOPOGRAPHY

1980

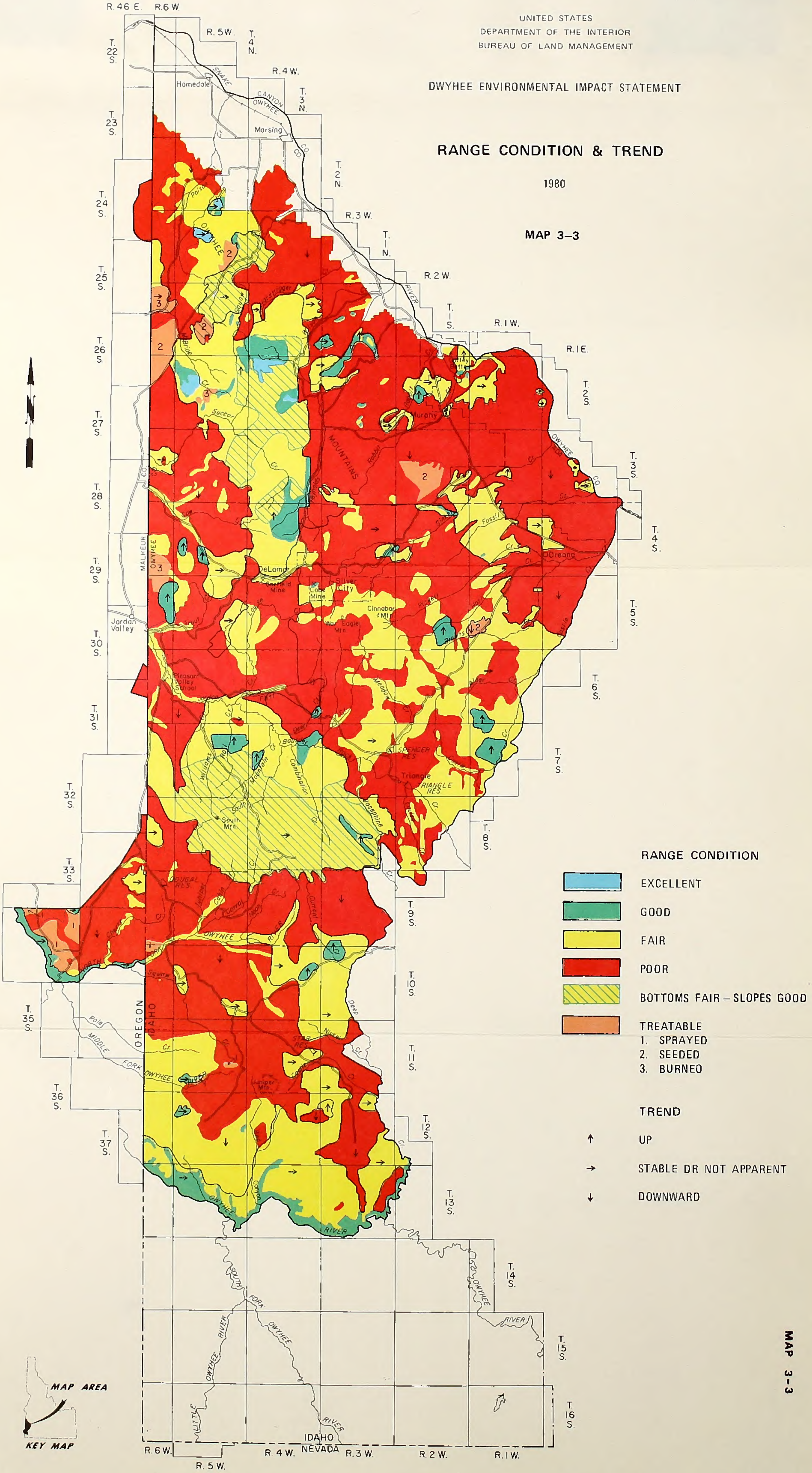
MAP 3–1



MAP 3-1



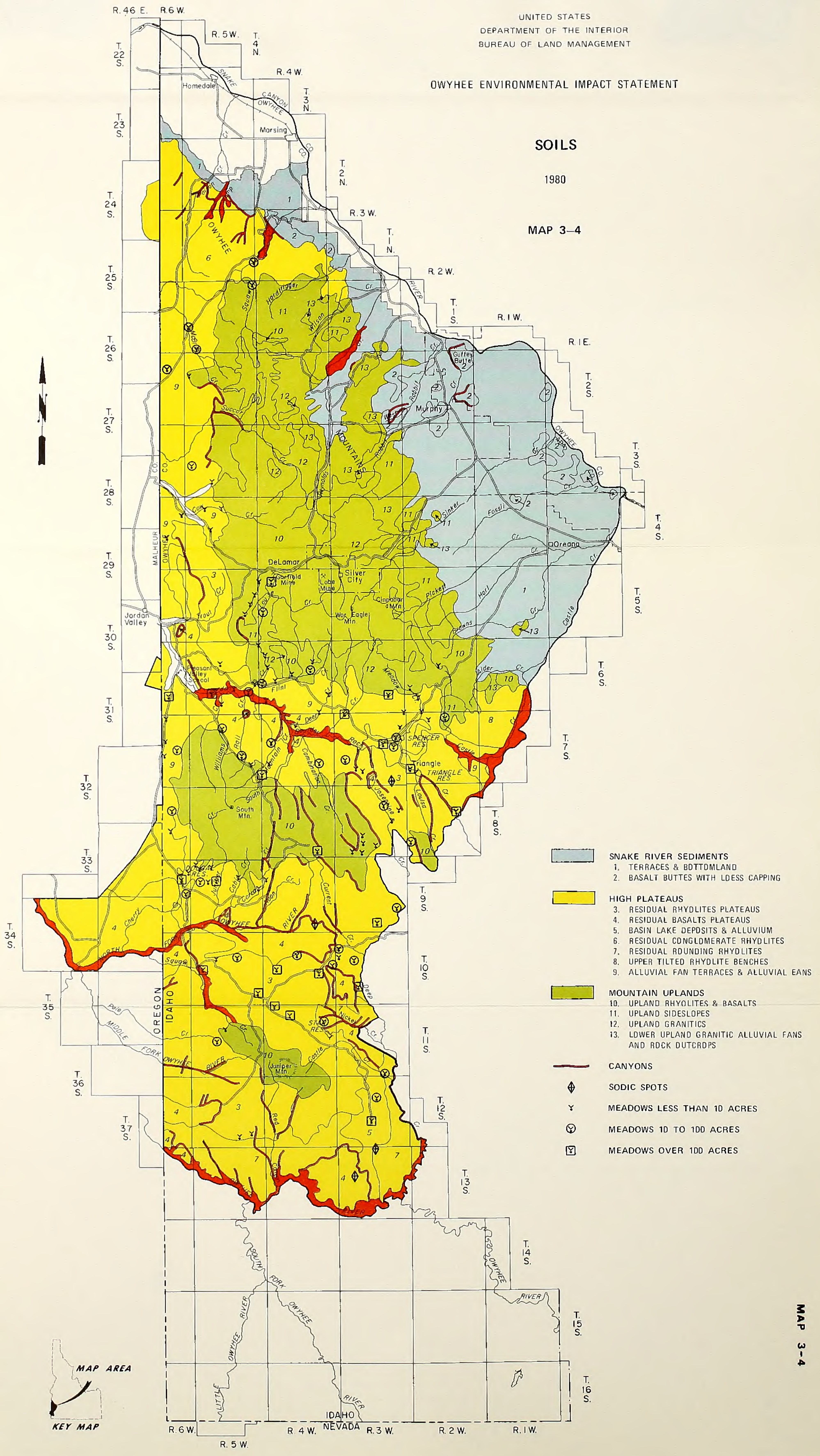
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OWYHEE ENVIRONMENTAL IMPACT STATEMENT
VEGETATION
1980
MAP 3–2
LOW SAGE
1. BASIN BIG SAGE
2. WESTERN JUNIPER
3. MOUNTAIN BIG SAGE
ROCK
4. LOW SAGE – MOUNTAIN BIG SAGE – WESTERN JUNIPER
SEDGE
5. JUNCUS – ROCKY MOUNTAIN IRIS
BASIN BIG SAGE
6. LOW SAGE
MOUNTAIN BIG SAGE
7. DOUGLAS FIR – BRUSH
8. BRUSH – WESTERN JUNIPER
9. BASIN BIG SAGE – LOW SAGE
10. LOW SAGE – BRUSH
WYOMING BIG SAGE
11. LOW SAGE – ROCK
12. SHADSCALE – ROCK
13. SHADSCALE – BARREN
14. 4-WING SALT BUSH – SHADSCALE
WESTERN JUNIPER (30% CANOPY COVER)
SODIC SPOTS
MEADOWS LESS THAN 10 ACRES
MEADOWS 10 TO 100 ACRES
MEADOWS OVER 100 ACRES
TREATED AREAS (SPRAYS, SEEDINGS, BURNS)
Homedale
Morsing
SNAKE RIVER
DeLamar
Silver City
Murphy
Oreana
Jordan Valley
South Mtn.
Juniper Mtn.
SPENCER RES
TRIANGLE RES
Triangle
OREGON
IDAHO
NEVADA
MALHEUR CO.
OWYHEE CO.
ADA CO.
CANYON CO.
OWYHEE RIVER
SOUTH FORK OWYHEE RIVER
MIDDLE FORK OWYHEE RIVER
LITTLE OWYHEE RIVER
MAP AREA
KEY MAP
MAP 3-2



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OWYHEE ENVIRONMENTAL IMPACT STATEMENT
RANGE CONDITION & TREND
1980
MAP 3-3
RANGE CONDITION
EXCELLENT
GOOD
FAIR
POOR
BOTTOMS FAIR – SLOPES GOOD
TREATABLE
1. SPRAYED
2. SEEDED
3. BURNED
TREND
UP
STABLE OR NOT APPARENT
DOWNWARD
N
MAP AREA
KEY MAP
R. 46 E.
R. 6 W.
R. 5 W.
R. 4 W.
R. 3 W.
R. 2 W.
R. 1 W.
R. 1 E.
T. 4 N.
T. 3 N.
T. 2 N.
T. 1 N.
T. 1 S.
T. 2 S.
T. 3 S.
T. 4 S.
T. 5 S.
T. 6 S.
T. 7 S.
T. 8 S.
T. 9 S.
T. 10 S.
T. 11 S.
T. 12 S.
T. 13 S.
T. 14 S.
T. 15 S.
T. 16 S.
T. 22 S.
T. 23 S.
T. 24 S.
T. 25 S.
T. 26 S.
T. 27 S.
T. 28 S.
T. 29 S.
T. 30 S.
T. 31 S.
T. 32 S.
T. 33 S.
T. 35 S.
T. 36 S.
T. 37 S.
Homedale
Marsing
SNAKE
CANYON
OWYHEE
RIVER
Murphy
Oreana
DeLamar
Silver City
War Eagle Mtn
Cinnabar Mtn
Jordan Valley
Pleasant Valley School
SPENCER RES
Triangle
TRIANGLE RES
South Mtn
DOUGAL RES
STAR RES
Juniper Mtn
MALHEUR
OWYHEE
OREGON
IDAHO
NEVADA
MIDDLE FORK
SOUTH FORK
LITTLE

General Soil Mapping Unit Characteristics

Soils	Color	Soil Taxonomy to Subgroup	Dominant Soil Depth	Subsoil Characteristics	Dominant Slope Range	Approximate Rainfall Zones	Approximate Elevation
1	Blue	Xeric Torriorthents Typic Haplargids Typic Camborthids	shallow to deep	variable but mostly silty	5-35%	7-10" P.t.	2,500-3,500
2	Blue	Typic Torriorthents Xeric Torriorthents	moderately deep to shallow	sandy loams to light silty clay loams	2-15%	7-10" P.t.	3,000-3,500
3	Yellow	Typic Argixerolls lithic Xerollic Haplargids Abruptic Xerollic Durargids	moderately deep and shallow	clayey	5-25%	13-16" P.t.	4,500-6,000
4	Yellow	Abruptic Xerollic Durargids Xerollic Haplargids	shallow	heavy clay	1-10%	12-16" P.t.	4,500-6,000
5	Yellow	Xerollic Haplargids Xerollic Paleargids	moderately deep to shallow	clayey	2-15%	12-16" P.t.	4,500-5,500
6	Yellow	Duruxerollic Haplargids Xerollic Durargids Xerollic Paleargids	shallow to moderately deep	stony heavy clay	5-20%	10-13" P.t.	3,500-5,000
7	Yellow	Lithic Xerollic Haplargids Xerollic Haplargids	shallow	very stony heavy clays	10-35%	10-16" P.t.	5,000-6,000
8	Yellow	Lithic Argixerolls Argic Pachic Cryoborolls	shallow with deep inclusions	stony heavy clays	2-15%	16-20" P.t.	5,500-6,500
9	Yellow	Abruptic Xerollic Durargids Abruptic Aridic Durixerolls Typic Argixerolls	shallow to moderately deep	stony heavy clays	2-40%	10-16" P.t.	4,000-5,500
10	Green	Pachic Ultic Argixerolls Ultic Argixerolls Pachic Cryoborolls	all depths	stony clayey	5-50%	18-40" P.t.	6,000-8,000
11	Green	Typic Argixerolls Typic Palexerolls lithic Argixerolls	shallow	stony clay	10-40%	13-16" P.t.	4,000-6,500
12	Green	Pachic Haploxerolls Pachic Cryoborolls Typic Haploxerolls	deep	coarse sandy loam	20-50%	18-40" P.t.	6,000-8,000
13	Green	Xerollic Camborthids Ultic Haploxerolls Aridic Haploxerolls	deep to moderately deep	coarse sandy loam	5-35%	10-13" P.t.	3,000-4,500
<10 Acres 10-100 Acres >100 Acres		Cumulic Haploxerolls Aquic Haploxerolls	deep and very deep	silty loams and fine sandy loam	0-3%	13-20" P.t.	4,500-6,500
		Aquic Natrargids	moderately deep to deep sodic areas	silt loam or very fine sandy loam	0-1%	10-16" P.t.	4,000-5,500
	Red	Rock outcrop Rock Mesa sideslopes	very rocky & shallow alluvial soils	These areas on the map restrict animal movement	>35%	10-18" P.t.	4,000-7,000



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OWYHEE ENVIRONMENTAL IMPACT STATEMENT
SOILS
1980
MAP 3–4
SNAKE RIVER SEDIMENTS
1. TERRACES & BOTTOMLAND
2. BASALT BUTTES WITH LOESS CAPPING
HIGH PLATEAUS
3. RESIDUAL RHYOLITES PLATEAUS
4. RESIDUAL BASALTS PLATEAUS
5. BASIN LAKE DEPOSITS & ALLUVIUM
6. RESIDUAL CONGLOMERATE RHYOLITES
7. RESIDUAL ROUNDING RHYOLITES
8. UPPER TILTED RHYOLITE BENCHES
9. ALLUVIAL FAN TERRACES & ALLUVIAL FANS
MOUNTAIN UPLANDS
10. UPLAND RHYOLITES & BASALTS
11. UPLAND SIDESLOPES
12. UPLAND GRANITICS
13. LOWER UPLAND GRANITIC ALLUVIAL FANS AND ROCK OUTCROPS
CANYONS
SODIC SPOTS
MEADOWS LESS THAN 10 ACRES
MEADOWS 10 TO 100 ACRES
MEADOWS OVER 100 ACRES
MAP AREA
KEY MAP

MAP 3-4

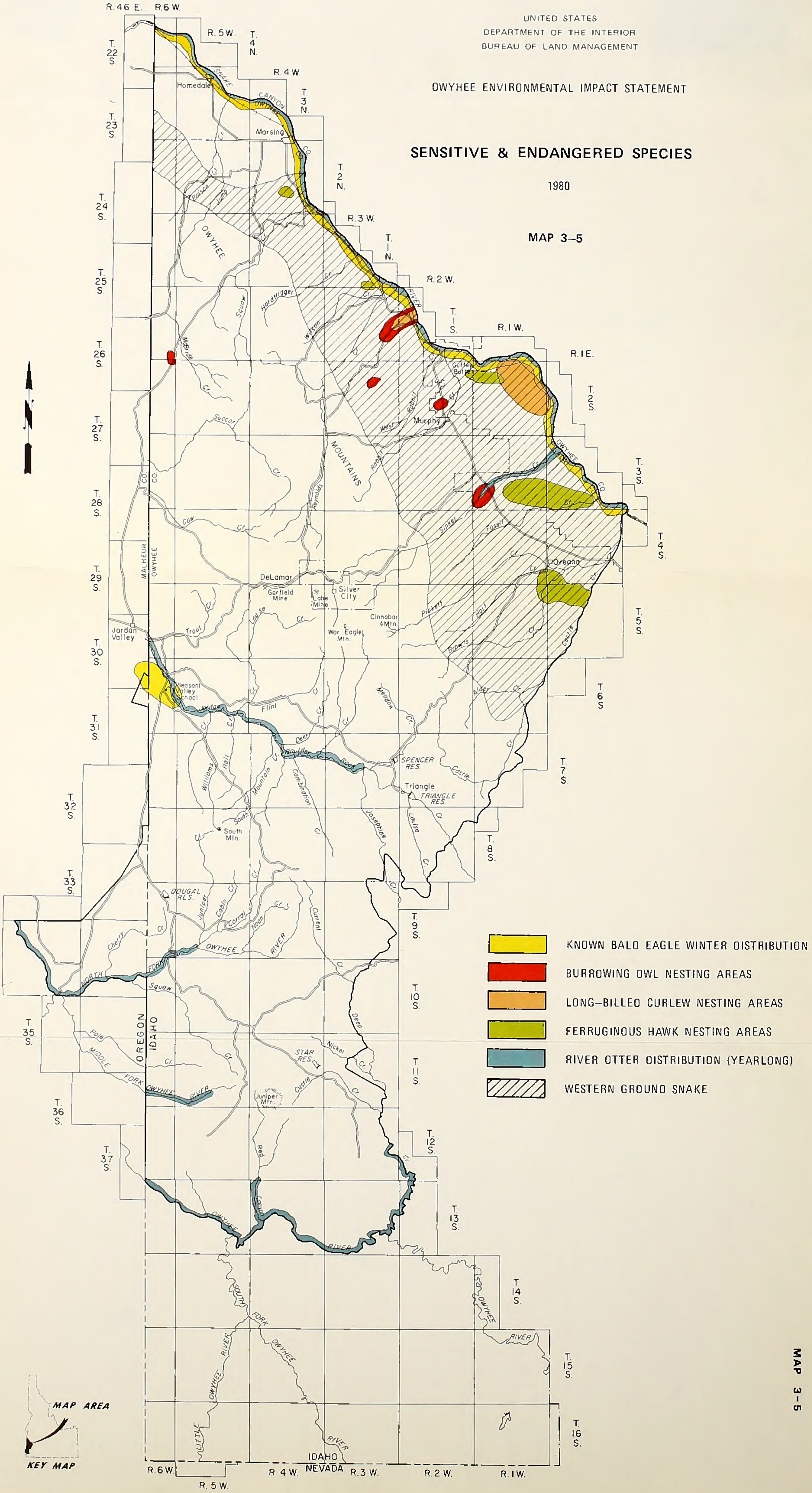
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OWYHEE ENVIRONMENTAL IMPACT STATEMENT

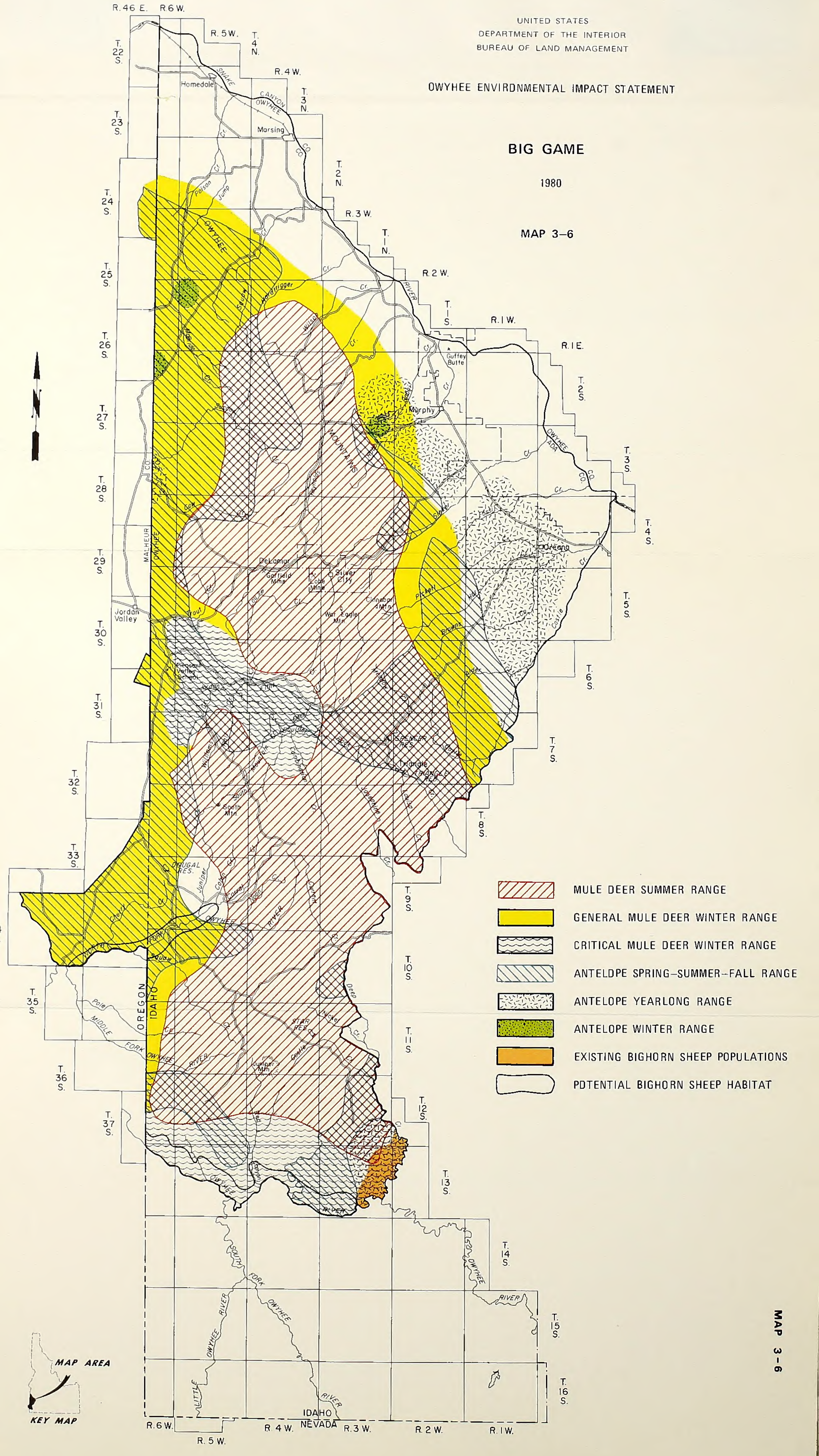
SENSITIVE & ENDANGERED SPECIES

1980

MAP 3–5



MAP 3–5


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OWYHEE ENVIRONMENTAL IMPACT STATEMENT
BIG GAME
1980
MAP 3–6
MULE DEER SUMMER RANGE
GENERAL MULE DEER WINTER RANGE
CRITICAL MULE DEER WINTER RANGE
ANTELOPE SPRING–SUMMER–FALL RANGE
ANTELOPE YEARLONG RANGE
ANTELOPE WINTER RANGE
EXISTING BIGHORN SHEEP POPULATIONS
POTENTIAL BIGHORN SHEEP HABITAT
Homedale
Marsing
Murphy
Guffey Butte
Oreana
DeLamar
Silver City
Jordan Valley
Triangle
South Mtn
OREGON
IDAHO
NEVADA
MALHEUR CO.
OWYHEE CO.
MAP AREA
KEY MAP
MAP 3–6

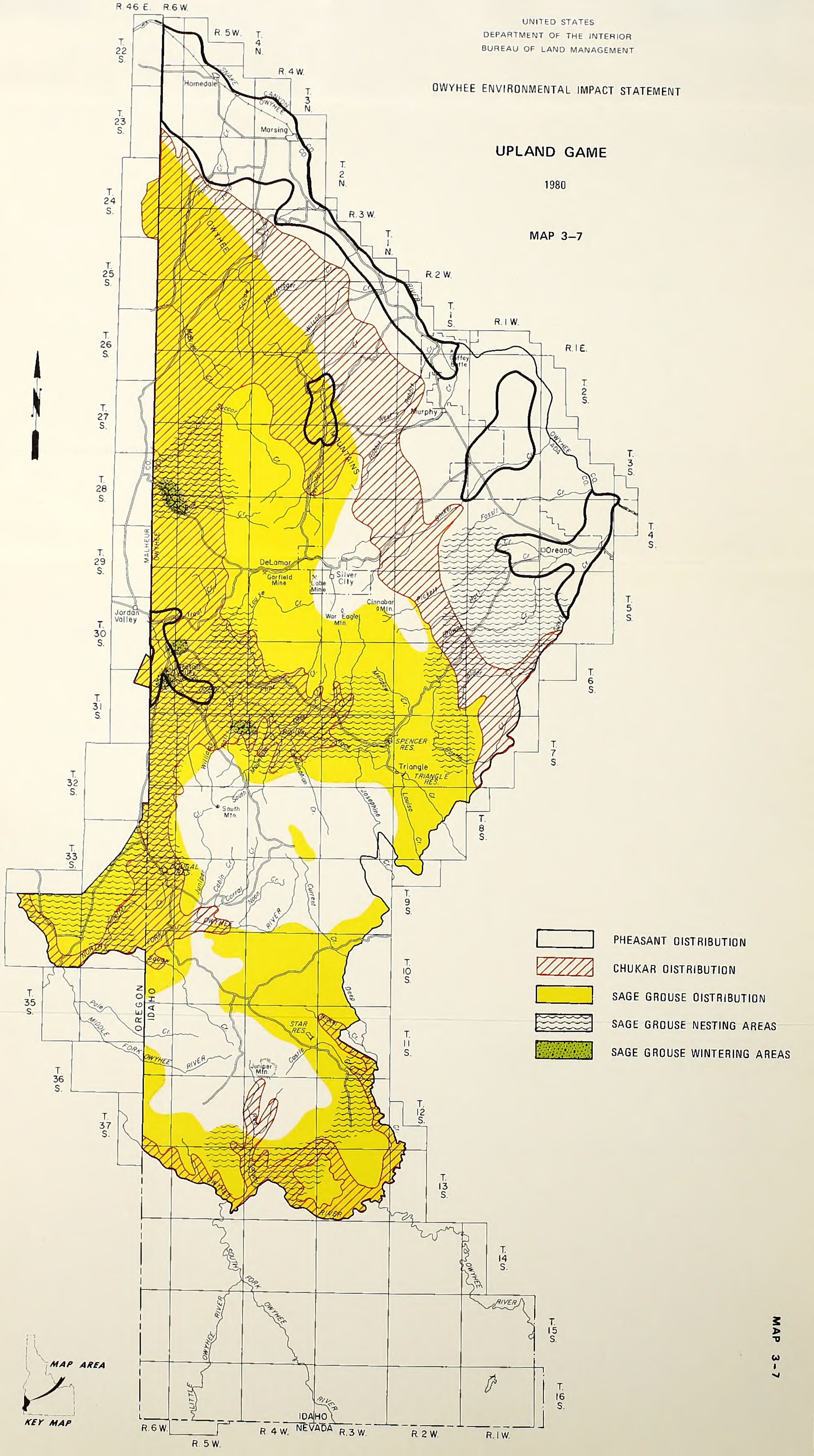
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

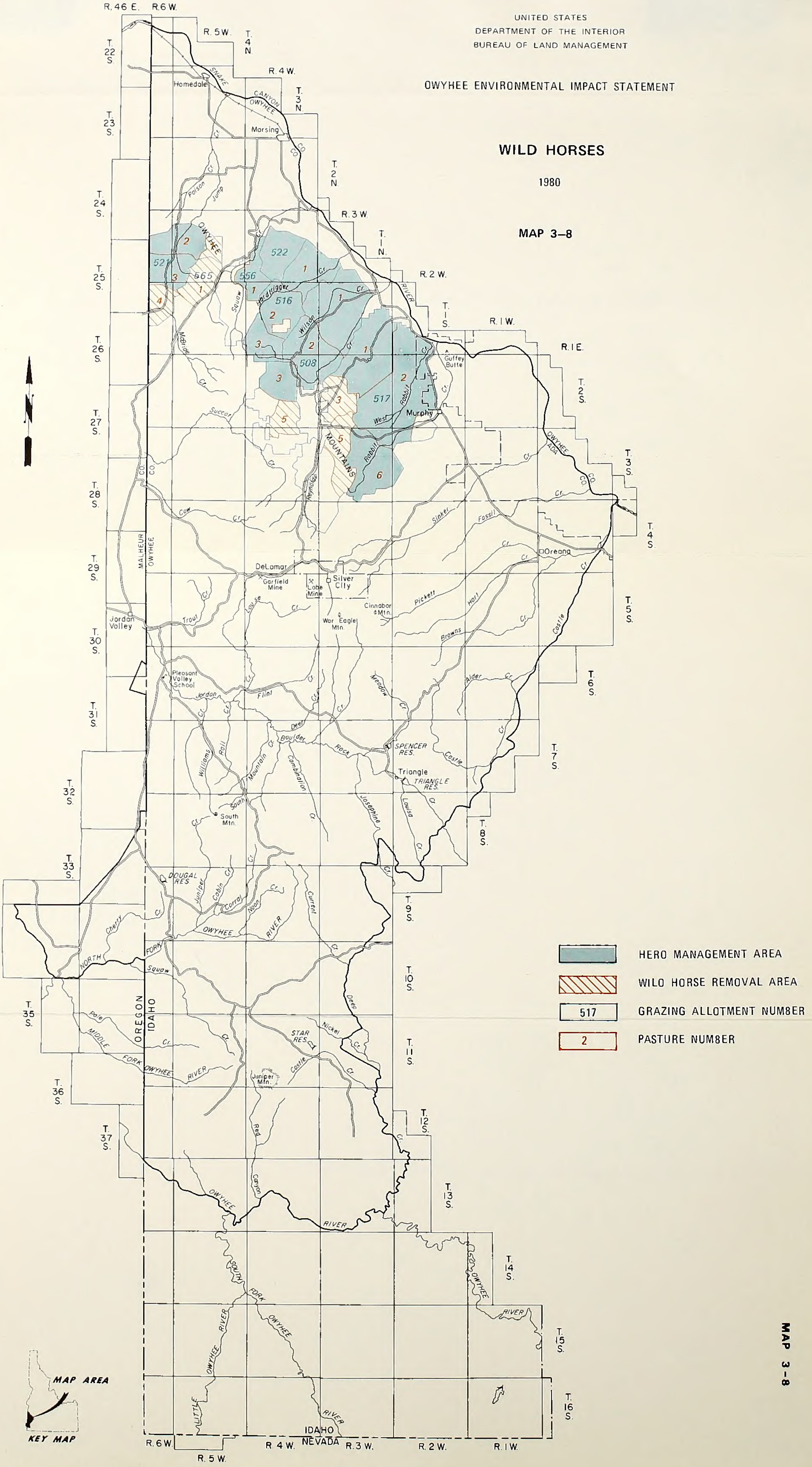
OWYHEE ENVIRONMENTAL IMPACT STATEMENT

UPLAND GAME

1980

MAP 3–7




UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OWYHEE ENVIRONMENTAL IMPACT STATEMENT
WILD HORSES
1980
MAP 3–8
HERO MANAGEMENT AREA
WILO HORSE REMOVAL AREA
517 GRAZING ALLOTMENT NUMBER
2 PASTURE NUMBER
MAP AREA
KEY MAP
Homedale
Marsing
Murphy
Guffey Butte
Oreana
DeLamar
Silver City
Garfield Mine
Lobe Mine
Cinnabar Mtn.
War Eagle Mtn.
Jordan Valley
Pleasant Valley School
Triangle
SPENCER RES.
TRIANGLE RES.
South Mtn.
DOUGAL RES.
STAR RES.
Juniper Mtn.
OREGON
IDAHO
NEVADA
OWYHEE MOUNTAINS
SNAKE RIVER
OWYHEE RIVER
MAP 3-8

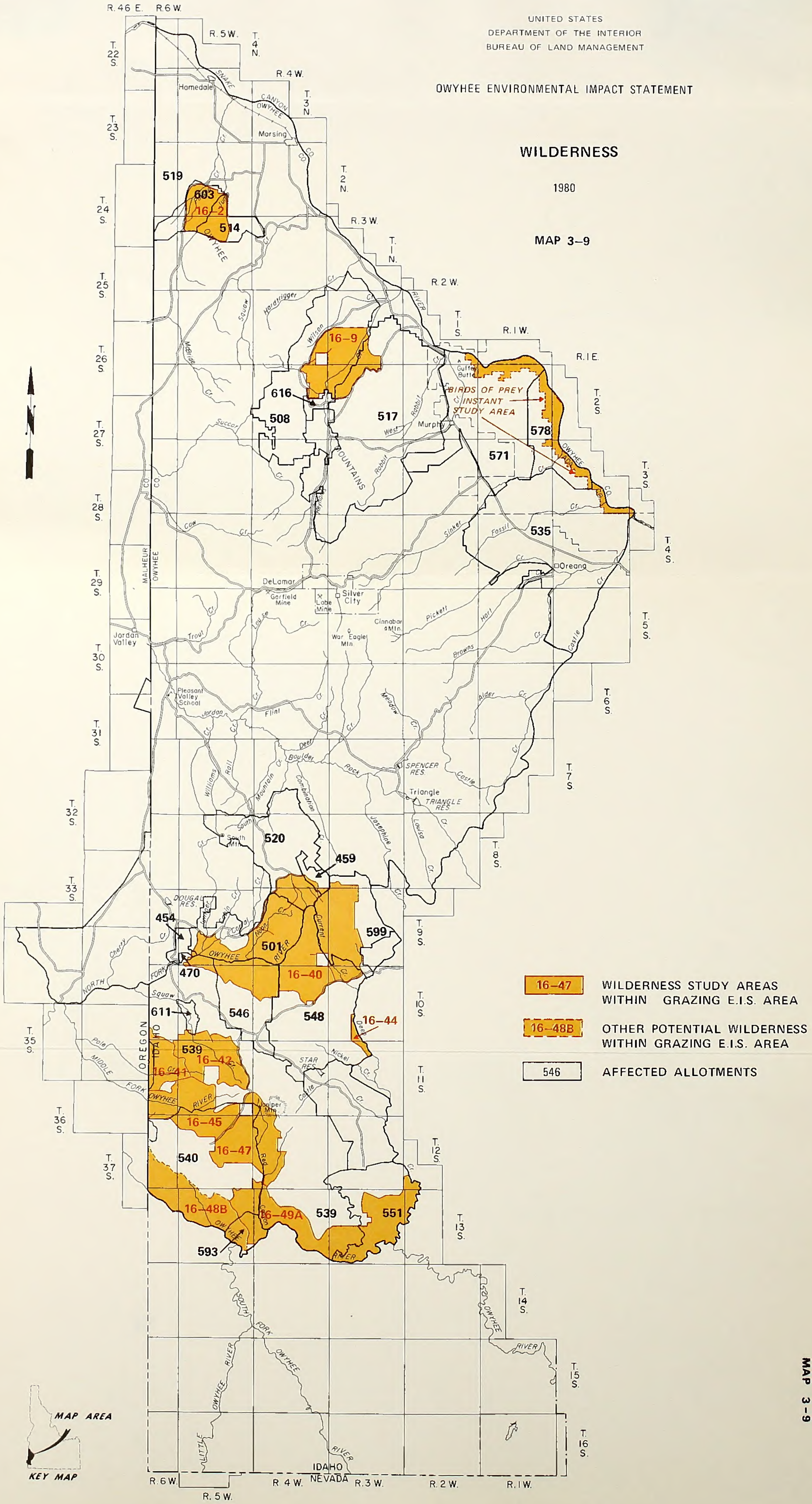
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OWYHEE ENVIRONMENTAL IMPACT STATEMENT

WILDERNESS

1980

MAP 3–9



MAP 3–9

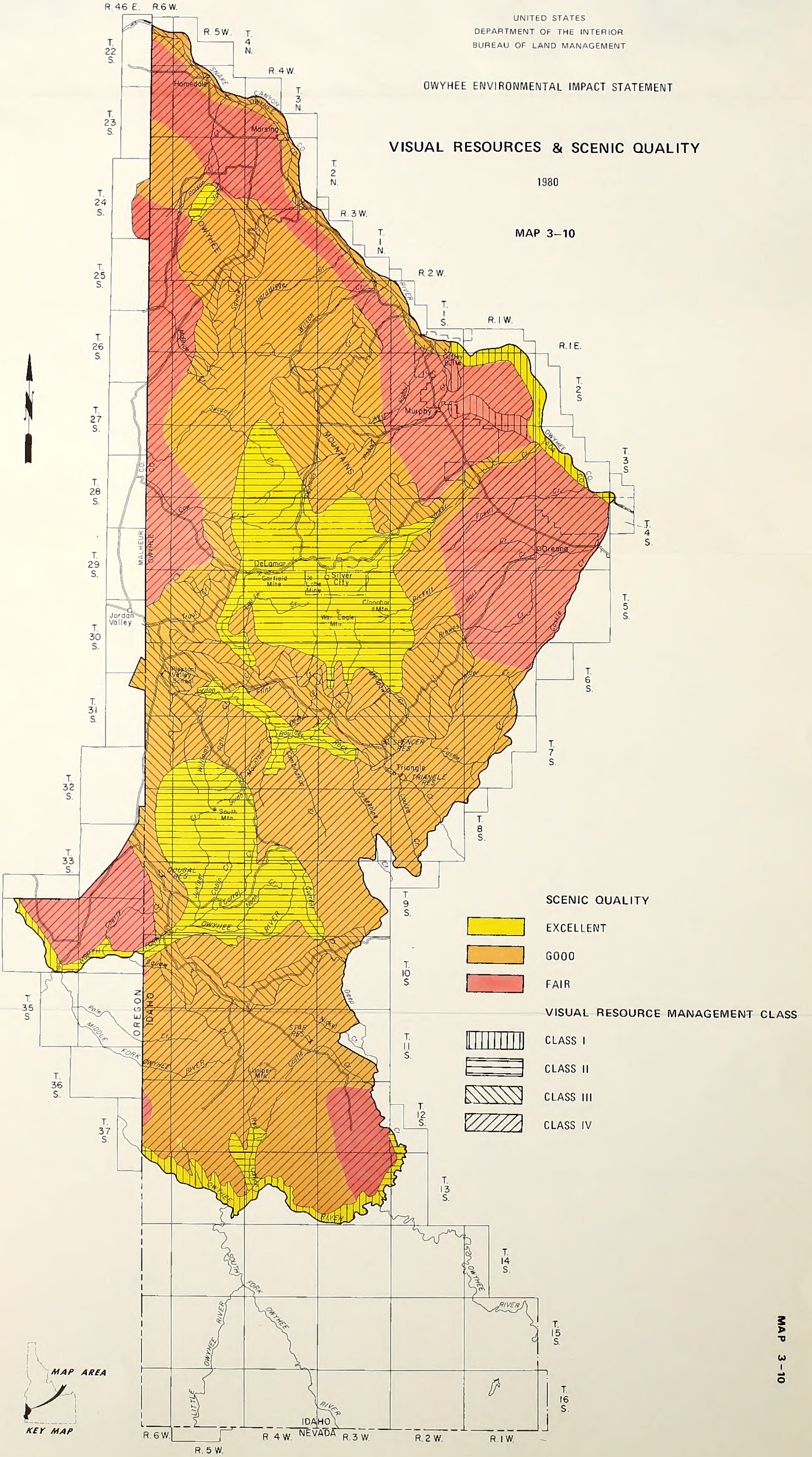
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

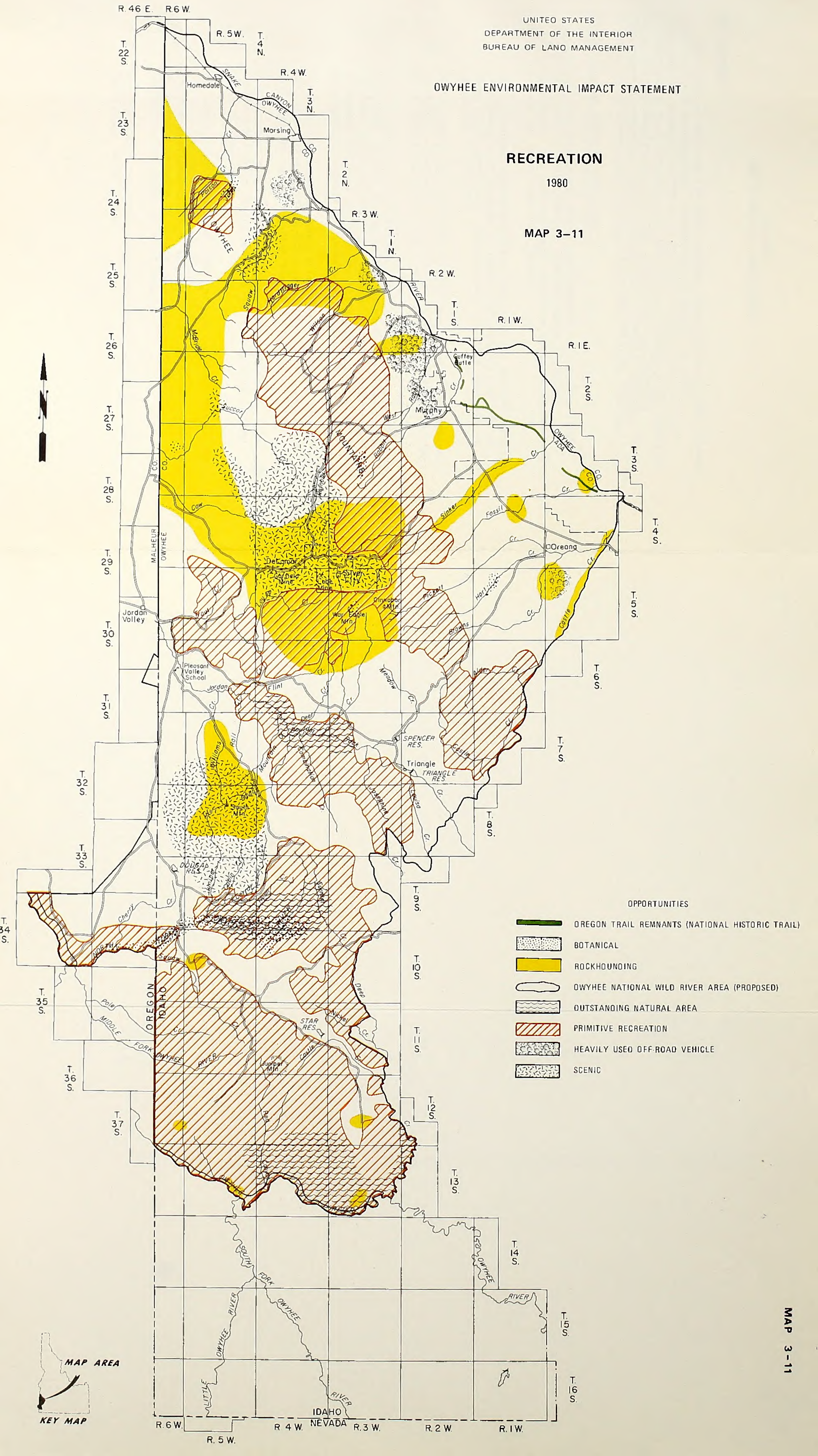
OWYHEE ENVIRONMENTAL IMPACT STATEMENT

VISUAL RESOURCES & SCENIC QUALITY

1980

MAP 3–10





UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OWYHEE ENVIRONMENTAL IMPACT STATEMENT
RECREATION
1980
MAP 3-11
OPPORTUNITIES
OREGON TRAIL REMNANTS (NATIONAL HISTORIC TRAIL)
BOTANICAL
ROCKHOUNDING
OWYHEE NATIONAL WILD RIVER AREA (PROPOSED)
OUTSTANDING NATURAL AREA
PRIMITIVE RECREATION
HEAVILY USED OFF-ROAD VEHICLE
SCENIC
MAP AREA
KEY MAP
Homedale
Marsing
Murphy
Guffey Butte
Oreana
DeLamar
Silver City
War Eagle Mtn
Jordan Valley
Pleasant Valley School
SPENCER RES.
Triangle
TRIANGLE RES.
South Mtn
DOUGAL RES.
STAR RES.
Juniper Mtn
SNAKE
OWYHEE
CANYON
MOUNTAINS
OREGON
IDAHO
NEVADA
MALHEUR
SOUTH FORK OWYHEE RIVER
LITTLE OWYHEE RIVER
MIDDLE FORK OWYHEE RIVER
NORTH FORK
MAP 3-11

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

Introduction

This chapter analyzes the environmental consequences of the proposed action and all alternatives. Impacts are analyzed for those environmental elements predicted to be significantly impacted by implementation of the proposal or alternatives. Based on the analysis, no significant impacts are predicted to occur on the following environmental elements: Climate, Topography, Minerals, Geology, Air Quality, or Threatened and Endangered Plant and Wildlife Species.

Assumption and Analysis Guidelines

1. Allotment management plans incorporating appropriate forage allocations, season-of-use, grazing systems, project development and land treatment practices would be implemented within the identified time frames.

2. When allotment management plans are prepared, an environmental assessment would be made to assess site specific impacts of range improvements and land treatment projects that are not addressed in this EIS.

3. The Bureau of Land Management (BLM) would fund the improvements required to implement the proposed action or alternatives and do so within the stated time frame.

4. A wild horse activity plan would be prepared which includes the management of wild horses to meet management numbers in the proposed action or respective alternatives. An environmental assessment would be prepared on this activity plan to address site specific impacts not addressed in this EIS.

5. The necessary manpower would be furnished by and to the Boise district, and a rigorous effort would be made to completely carry out the monitoring program.

6. The design criteria and standard operating procedures described in the description of the proposed action and alternatives would be adhered to.

7. The impact analysis assumes that the total acreage identified for land treatment would be completed even though on an individual allotment basis, acreages treated may be constrained by criteria designed to protect wilderness, wildlife, aesthetics, watershed or other values.

8. For purposes of analysis, long-term impacts are those that would occur in 20 years.

Description of Proposed Action (summary)

Vegetation for consumptive use would be allocated to livestock, wild horses, deer, antelope and bighorn sheep. Vegetation would be allocated to satisfy reasonable wildlife numbers determined during the BLM planning process. Wild horses would be managed within a range of 118 head to 178 head. Initial livestock use would increase on 30 allotments, decrease on 81 allotments and 32 allotments presently being grazed but not licensed would be licensed. Overall, the total active grazing preference would be reduced from 113,122 AUMs to 78,336 AUMs (31 percent).

Special riparian management practices including fencing would be applied to 64 stream miles. On 86 miles of stream, log structures would be placed on streambanks to discourage livestock trailing along stream bottoms. Implementation of the proposal would require development of 81 springs, 90 reservoirs, 24 miles of pipeline, and 100 watering troughs; 153 miles of fence would be constructed, and thirteen miles of fence would be removed. Sagebrush and juniper control is proposed on 172,000 acres. An additional 67,000 acres would receive brush control and be artificially revegetated.

IMPACTS TO VEGETATION

Introduction

Heavy stocking and long seasons-of-use by livestock year after year have been major factors in the deterioration of the range (Hormay 1970). The resulting use patterns of plant species and areas have become uneven with the use occurring on the same plants in the same areas every year. This leads to progressively enlarging areas of deterioration with the best plants and grazing sites being destroyed first (Hormay and Evanko 1958).

Literature reviews substantiate land treatment impacts to vegetation are diverse and highly dependent on site-specific characteristics. A specific treatment on one site may be beneficial, but the same treatment on a different site may be detrimental.

Exact treatment methods or areas were not prescribed on the allotment level, but would be limited to spraying, burning, or chaining. Therefore, analysis of specific treatment impacts was restricted to a relative comparison of general impacts associated with each of the treatment methods. Treatment acres proposed represent a maximum opportunity for treatment rather than a projected goal.

Condition and Trend

Grazing Management:

Before improvements to range condition (resulting from increased plant densities, more desirable plant composition and improved soil stability) can be realized, individual plant vigor must be improved (Parker 1954). The determination of individual plant vigor response becomes a primary step in predicting condition improvements. Vigor recovery can be affected by several factors, including grazing system design, grazing utilization levels, livestock-plant interactions, and individual plant "rest" requirements. An evaluation of these factors is required to determine net vigor response, in terms of magnitude and time required.

The intent of the proposed grazing systems is to provide plants an opportunity for rest during different stages of phenological development to improve individual plant vigor. An allotment by allotment analysis indicated vegetative improvement would not occur on eleven allotments (52,211 acres) for reasons presented in Table 4-1. The remaining proposed grazing systems (962,085 acres) contained opportunities for periodic resting of the plant.

Several authors (Johnson 1965; Hormay and Talbot 1961; Stoddart et. al. 1975) point out heavier livestock utilization is possible with well-designed grazing systems. Heady (1952) reports that "an average utilization of the key species over a number of years which approximates 50 percent is a reasonable expression of proper use for most grassland ranges." Stocking levels proposed are predicted to have positive impacts to plant vigor recovery.

Stoddart et. al. (1975) states "there are instances in which total protection of range from livestock has failed to result in the expected revival of the vegetation, presumably because of the lack of animal action in aiding reproduction." Benefits to properly grazed plants are similar to benefits from properly pruned orchard trees. The plants "become more bushy, and the forage less rank."

Young et. al. (1976) goes on to say "removing the domestic animals would leave stark, static, shrub dominated communities open to invasion by alien plants, some of which can persist in native plant communities in equilibrium with the environment."

In one study it was found that more seedlings were established under grazing (trampling effect of seed) than on unused ranges (Sampson and Malsten 1926). The presence of livestock and the resulting livestock plant interactions are predicted to have positive impacts to plant vigor recovery.

A comparison of the proposed seasons-of-use (Appendix Table C-8) and the "average" plant readiness for grazing (Table 3-1) indicates the proposed turn-out dates may be four to six weeks too early to provide adequate plant protection or seed dispersal in every year. Studies by Stoddart et. al. (1975) indicate phenological stages varied as much as 36-47 days in central Utah and southeastern Idaho. The improvement in plant vigor predicted from proposed grazing systems and stocking would be slower than anticipated because of the earlier turn out dates.

While it is recognized that the proposed grazing management would improve individual plant vigor and ultimately ecological condition, the rate at which the range would improve appears to be quite slow, primarily because vigor recovery of EIS area key species could be slow. Mueggler (1975) found that poor vigor Idaho fescue and bluebunchwheatgrass would recover to normal levels of vigor if protected from clipping for six to eight years. Dillion and Wallenmeyer (1966) state that low vigored bluebunch wheatgrass needs all its leaves to improve, especially when the stand has been invaded by cheatgrass.

Mclean and Tisdale (1972) found that 20 to 40 years of complete rest was required for range to recover excellent condition after overgrazing. On poor condition range, ten years rest yielded little change in condition. The change from poor to fair took longer than the change from fair to good.

In this analysis, the primary vegetation characteristics used to assess environmental impacts to vegetation were ecological condition and trend. Very little research has been documented on what the combined effects of grazing management (e.g., turn-out dates, various grazing systems, etc.), project developments (e.g., springs, reservoirs, etc.), and land treatments (e.g., sprays, burns, seedings) have on the ecological condition of sagebrush-bunchgrass range. As a result, precise quantification of impacts to vegetation is not probable. Estimation of vegetation impacts resulting from various grazing systems, intensity of management, utilization levels and seasons-of-use becomes an artful application of professional judgement, guided by appropriate literature. This is consistent in all alternatives and makes a relative comparison analysis possible.

Based on an allotment by allotment analysis of present condition and the associated interpretations of the previously cited literature, the following assumptions were used to predict the 20-year condition resulting from grazing management:

1. Condition on eleven allotments (52,211 acres) would not change for reasons discussed in Table 4-1

Table 4-1
Allotments in Which No Condition Improvement is Predicted

Allotment Numbers	Total Acres	Reason for Lack of Improvement
513,514,522, 521(past. 4), 525	32,441	Carrying capacity imbalance of pastures would negate the possibility of making pasture shifts when plant phenology requirements dictate.
557,572,597*	4,167	Insuffecent fencing proposed for implementation of grazing systems. *Currently in good condition.
585	4,108	Existing seeding is declining in carrying capacity because of sagebrush reinvasion. No retreatment is proposed because area has a marginal treatment capability.

Table 4-1 (cont.)

Allotment Numbers	Total Acres	Reason for Lack of Improvement
542	1,638	Majority of current carrying capacity is contributed from an old spray at the south end of the allotment. Sagebrush is reinvading this area and no retreatment is proposed.
578	9,857	Lack of native perennial plant production to provide adequate seed sources for recovery.

2. Areas currently exhibiting upward trends (75,648 acres) would improve one condition class in less than ten years. Plant reproductive vigor on these areas is currently at favorable levels. The condition response of these areas was therefore expected to occur more quickly because there would not be a time period required for vigor improvement.

3. Areas currently exhibiting static trends (365,458 acres) would initiate upward trends with approximately one-third to one-half of these areas improving one condition class in 20 years. Plants in these areas do not exhibit the vigor levels required to maintain adequate seed production; however, reproductive vigor recovery will be less than the 6-8 years discussed by Mueggler (1975). Allotments in good and excellent vegetation condition were predicted to achieve quicker and greater improvement than those allotments in poor and fair condition. This is supported by studies by McLean and Tisdale (1972).

4. Areas currently exhibiting downward trends (520,979 acres) would exhibit static to upward trends but would not improve enough to jump a condition class, unless they are already in good condition. Plants in these areas currently exhibit low vigor. While the proposed grazing management will improve plant vigor on the areas, the time required for vigor recovery and seedling establishment could be as much as 6-8 years (Mueggler 1975). Perennial grass densities must be improved before condition can improve (Parker 1954). On ranges in poor or fair ecological condition, improvement will be slower than on good condition ranges (McLean and Tisdale 1972).

Based on the above assumptions and the resulting analysis, overall EIS area condition and trend would improve from the proposed grazing management (see Table 4-2 for a summary of condition).

Table 4-2
Condition Class Summary
From Grazing Management in the Proposed Action[1]

	Condition Class				
	Poor	Fair	Good	Excellent	Treated
Current Situation	56.8	35.2	5.1	0.3	2.6
20-year Projection	42.3	34.9	19.6	1.4	1.8

[1] Values are in terms of percent of area acres within each condition class

Land Treatments:

The areas scheduled for treatment are in poor to fair condition. These areas can be characterized by dense stands of sagebrush (over 50 percent of plant composition) with low vigored desirable grasses (e.g., bluebunch wheatgrass, Idaho fescue) often relegated to protected positions beneath shrub canopies.

Parker (1954) suggests improvement of individual plant vigor must be achieved before improvements to plant densities, plant community composition, and soil stability (i.e., improved range condition) can be achieved. The determination of individual plant vigor response becomes the first task in predicting condition improvements.

Nielson and Hinckley (1975) report similar sagebrush and juniper kills can be expected using any of the proposal treatments. Spraying and burning were the most effective (60-100 percent kills). The least effective method was chaining, because the chain was not effective in breaking off the younger flexible plant stems (50-70 percent kills). Removal of the older, dominant plants would enhance growth of the residual young stems and reduce project longevity by five to ten years from project longevities (15-25 + years) expected in spraying and burning, (Vallentine 1971).

Vigor response of sprouting species (aspen, snowberry, ceanothus, rabbitbrush, etc.) are similar in all treatments. Top-kill of these species is common, but vigorous sprouting (in 1-3 years) returns plants to favorable vigor levels (Vallentine (1971). Significant kills (50-75 percent) of bitterbrush, a weak sprouter, have been reported if spraying is not timed properly or if prescribed burns are too heavy (Vallentine 1971).

Vigor responses of grass and forb species vary significantly between treatment types. Sprays and chainings generally have little or no adverse impacts to grasses and forbs (Nielson and Hinckley, 1975; Vallentine 1971). However, burning has serious consequences to many of the desirable grass and forb species (Pechanec et. al. 1954 revised). The effects of fall burning on several plant species in the EIS Area are presented in Table 4-3. Anticipated recovery rates from burning are presented in Table 4-4.

Table 4-3
Effects of Fall Burning
for Selected Species[1]

Severely Damaged	Slightly Damaged	Undamaged
big sagebrush	bluebunch wheatgrass	cheatgrass
bitterbrush	Indian ricegrass	crested wheatgrass
curlleaf mountain mahogany	Nevada bluegrass	prairie Junegrass
Eriogonum species	Penstemon species	Sandberg bluegrass
Idaho fescue	squirreltail	snowberry
Phlox species	Astragalus species	yarrow
Needle-and-thread	serviceberry	western wheatgrass

[1] Source: Wright et. al. (1978)

Table 4-4
Recovery Rates Following Burning
for Selected Species[1]

Species	Comments
bluebunch wheatgrass	Normal production reached one to three years following burn.
needle-and-thread	Normal production reached three to eight years following burn.
Idaho fescue	Twelve to 30 years required for complete recovery.
prairie Junegrass	Three to eight years required for recovery.
big sagebrush	Ten percent of normal production after twelve years; normal production after 30 years.
bitterbrush	Fifty to 60 percent of normal after fifteen years; 30 to 40 years required for recovery.
rabbitbrush	Reduce one to three years after burn, three times normal after twelve years; on sandy soils, four to nine times normal after eight to eighteen years.
horsebrush	Fifty percent reduction one year after burn, two times normal after three years, five times normal after twelve years.
serviceberry	Thirty to 50 years to return to normal.

[1] Source: Wright et. al. (1978)

Plant vigor responses from all treatments would generally be favorable over the 20-year planning period. If individual plant vigor improves, range condition and trend would improve. Appendix G describes how treatment acreages are calculated into net condition responses. Implementation of the proposed treatments would require treatment of 162,483 acres (16.0 percent of EIS area) currently in poor condition and 71,162 acres (7.6 percent of EIS area) currently in fair condition.

Cover

Grazing Management:

After the resultant condition class acreages were determined, effective ground cover was recalculated for each allotment using procedures presented in Appendix G. The recalculations indicated cover response was variable. On eleven allotments (52,211 acres), cover was calculated to remain unchanged because of no condition improvement. On the remaining allotments (962,085 acres), cover improvements were calculated to range from one to ten percent. This wide range of cover improvement reflects the amount of condition change expected after an allotment by allotment analysis (see Appendix Table F-6).

Land Treatments:

Land treatments are scheduled for ecological sites in poor and fair conditions. These sites currently exhibit average effective ground cover of 55 to 70 percent (Appendix Table F-2). Short-term (one to three years) cover losses can be expected because of the initial sagebrush kill and delays in recovering residual plant vigor (see condition and trend discussion above). However, plant treatments in the EIS have exhibited (after three years) average effective ground covers of 60 to 80 percent (an increase of five to ten percent over initial values). These increases were obtained from increased basal cover of grasses and forbs and the resprouting of certain shrub species. Proposed treatments are expected to respond similarly.

Productivity

Grazing Management:

Usuable forage available in 20 years was recalculated after 20-year condition class acres were predicted (see Appendix G). Total air-dry usable forage would increase 17,805,600 pounds (equivalent to 22,257 cattle AUMs). Proposed grazing management would increase present average EIS area usable forage (65.0 pounds per acre based on 50 percent utilization levels on intensively managed allotments and biological limits on other allotments) to 83.0 pounds per acre.

Land Treatment:

The productivity of herbaceous plants is expected to improve. Nielson and Hinckley (1975) report that yields from a loam range site produced 221 pounds per acre air-dry forage before spraying and 842 pounds per acre air-dry forage after spraying. In one study, grazing capacity for sheep and cattle increased an average of 70 percent on several burned sagebrush-grass ranges (Penchanec et. al. 1954, revised).

Ranges scheduled for seeding plus brush control are currently the least productive from a usable forage standpoint. Penchanec et. al. (1954, revised) found on ranges needing reseeding, the carrying capacity was increased five to twelve-fold before pretreatment values.

Observations in the EIS area, where brush was previously controlled, indicated average carrying capacities of seven acres per AUM. When brush controlled areas were seeded, average carrying capacities of four acres per AUM were observed (Anderson 1979, personal communication). While it is recognized that post treatment productivity can vary from site to site, the average observed EIS post treatment carrying capacities were used for this impact analysis. Treatments would make an additional 33,346,400 air-dry pounds of usuable forage available for allocation (equivalent to 41,683 cattle AUMs). This increase averages 33.0 pounds per EIS area acre.

Meadow/Riparian Vegetation

Grazing Management:

Cattle normally graze heavily on bottomland near water before moving onto the steeper upland country (Phillips 1965). This grazing pattern would ultimately lead to degradation of the bottomland vegetation. Behnke (1977) predicted little or no vegetation improvement in this ecological community if season-long deferred, or rest rotation grazing management strategies were adopted.

Ames (1977) reported on an area that has similar riparian vegetation "...that there is no known system of livestock management that will give adequate protection to a riparian zone. Even short term use or seasonal use is inadequate. The only way we have been able to insure adequate protection of our riparian types is by fencing them out from livestock use."

Hormay (1976) said, "Vegetation in certain areas, such as meadows and drainage ways are invariably closely utilized under any stocking rate or system of grazing. Where this is the case about the only way to preserve values is to fence the area off from grazing. Reducing livestock or adjusting the grazing usually will not solve such a problem."

With this cited literature in mind and considering that riparian vegetation is similar to referenced areas, little change is expected in this ecological community. What changes would be realized are attributed to reducing existing livestock numbers, implementation of grazing systems, and, primarily from the installation of protective fencing and log structures in the riparian areas (see aquatic wildlife section). A summary of condition is presented in Table 4-5.

Range Improvements

Obtaining uniform livestock distribution on cattle range is a major management problem (Phillips 1965). In the EIS area as on other mountain ranges, cattle normally graze heavily on bottomland near water before moving onto the steeper upland country. Range improvements would be installed to improve the utilization patterns that exist today (see Maps 2-3 and 2-4 inside back cover of EIS). Poor grazing distribution can cause great difficulty in improving range conditions even when numbers of livestock are in balance (Johnson 1965).

Each spring installation would disturb approximately 1.5 acres. Total disturbance from all springs would equal 122 acres of which 90 percent are scheduled for fencing. The fenced areas (110 acres) would be revegetated naturally or artificially in one to three years. There would be long-term vegetation impacts on only twelve acres because of loss of vegetation.

The installation of 90 reservoirs would withdraw approximately 180 acres of rangeland from production. Several of the reservoirs (80 percent) are scheduled for fencing (144 acres). Revegetation (natural or artificial) would occur in one to three years. The remaining 36 acres would have little or no vegetation remaining.

There are 24 miles of pipeline proposed for development. This would impact about 2.5 acres of vegetation per mile of pipeline (60 acres). While mitigating measures call for revegetation of the 60 acres, pipeline maintenance requirements could turn pipeline right-of-ways into roads. For this reason, revegetation of these areas (worse case analysis) is predicted to fail or be inadequate for soil protection (see soils section).

No adverse impacts are recognized to occur because of the proposed pasture fencing (153 miles).

In summary, range improvements would adversely impact a maximum of 108 acres of vegetation. The lack of existing data and appropriate literature makes precise quantification of impacts impossible; however, the impact of improving livestock grazing distribution is recognized to have positive value.

Summary

The desired ecological condition class acreage stated in the objectives would be attained within the 20-year planning period.

Existing ecological condition on upland and meadow/riparian bottomland would improve from proposed grazing management, riparian fencing and log structures, range improvements, and land treatments. A comparison of existing and 20-year ecological conditions is presented in Table 4-5. An allotment specific summary is presented in Appendix Table F-6.

Table 4-5
Condition Class Summary
Proposed Action for Public Lands in EIS Area[1/]

Ecological Condition Class	Initial Ecological Condition Meadow/Riparian Areas	Initial Ecological Condition Total EIS Area	20-Year Ecological Condition Meadow/Riparian Area	20-Year Ecological Condition Total EIS Area
Poor	14.5	56.8	5.0	26.3
Fair	78.9	35.2	82.7	27.3
Good	6.6	5.1	12.3	19.6
Excellent	---	0.3	---	1.4
Treated	---	2.6	---	25.4[2/]
Total Percent	100.0	100.0	100.0	100.0

1/ Values are in terms of percent of area acres within each condition class. Currently, there are 9,718 acres of meadow/riparian vegetation in the 1,014,296 acre EIS area.

2/ Treatment acres correspond to areas previously in the poor and fair ecological condition classes.

Effective ground cover was calculated to have a net improvement of one to fifteen percent on 962,085 acres and show no change on 52,211 acres.

Grazing management would improve productivity of usuable forage by 17,805,600 pounds. Land treatments would provide an additional 33,346,400 pounds of usuable forage. Net increases of usable forage are summarized in Table 4-6. An allotment summary of net livestock AUM production gains is presented in Appendix Table C-9.

Table 4-6
Proposed Action, Useable Forage Summary[1/]

	Pounds	AUMs
Present Useable	66,253,600	82,817
20-Year Useable	117,405,600	146,757
Net Gain	51,152,000	63,940

1/ Useable competitive livestock forage at 50 percent utilization levels on intensive management allotments and biological limit utilization levels on other allotments.

SOILS

The impacts of grazing and grazing management on soil erosion, soil compaction, and soil productivity are discussed in this section. As soil compaction increases and infiltration rates decrease, much of the water which normally enters the soil profile would move across the surface and would not be available for plant use. Surface water movement increases the potential for soil erosion. Since vegetation significantly controls surface water movement, it also controls soil erosion and ultimately dictates the soil productivity through the remaining soil profile. Livestock affect vegetation and soil compaction causing changes in surface conditions which may affect runoff and soil erosion.

The proposed action would improve watershed conditions including characteristics such as soil erosion, soil compaction, and soil productivity. Implementation of the 50 percent utilization-monitoring program would have the greatest effect in achieving this goal by minimizing the adverse impacts of overutilization of range vegetation. The potential to erode soils is directly related to the amount of ground cover provided by vegetation, litter and surface rock. Decreasing grazing pressure would increase vegetative cover and litter return to the surface layer. Stabilizing the surface layer would decrease soil erosion, soil compaction, and increase soil productivity, ultimately improving watershed conditions. Specific elements of the proposed action which cause significant impacts are discussed below.

Intensive Management

Intensive management includes rest-rotation, deferred, and season-long grazing systems. There have been no statistically significant studies on the effects of different grazing systems on infiltration rates, runoff, or soil erosion that can be directly applied to the ORA (Gifford and Hawkins 1976). However, according to the vegetation section, the grazing systems would delay season-of-use on 44 allotments, periodically rest approximately 61 allotments and get better distribution of livestock in these allotments. Observation of allotments in the ORA which have grazing systems, show a beneficial effect on vegetative cover and improving erosion rates. Gifford and Hawkins (1976) state that more research is needed before any conclusions can be drawn on the effects of these systems. However, according to Ratcliff (1972) no difference was shown in spring soil compaction when rest rotation grazing was compared to season-long grazing; however there was a difference in the amount of soil compaction occurring in the summer and fall.

The proposed action would delay turn out dates an average of two weeks on 44 allotments. According to Sharp (1972), soil bulk density (compaction) is highest on heaviest grazed spring pastures and decreases as grazing intensity decreases. He also states that physical alteration of moist soils is more pronounced than that produced by the same grazing on drier soils. The postponing of turn out dates by two weeks would decrease the potential for soil compaction by providing more time for the soils to dry from spring runoff. Surface soil moisture is highly dependent on air temperatures, wind, and the time and duration of the last rainfall. Normally, when plant phenology indicates readiness for grazing, the soil surface moisture levels should be low enough to minimize the effects of soil compaction. Soil moisture levels, in the upper five inches, should be at field capacity or below (see glossary) for best management practices.

The proposed 50 percent utilization-monitoring system would decrease utilization levels. This reduction would decrease the effects of raindrop splash on soils, increase the amount of organic matter being returned to the soil and decrease the potential for runoff, erosion, and soil compaction. According to Musgrave's analysis, the erosion rates in tons/acre/year on 61 allotments would improve from 2 to 24 percent, with the average improvement nine percent. No change in erosion rates is shown in nine allotments (see vegetation section, proposed action).

Less Intensive Management

In these fifteen allotments, the initial stocking rates are based on the biological use limits and dietary preferences. This results in ten to fifteen percent lower utilization levels than on intensive allotments. This reduction in grazing pressure would lower the potential for short-term soil compaction and erosion. The results of Musgrave's analysis show a decrease in erosion rates, tons/acre/year from five to thirteen percent, averaging a nine percent improvement.

Management in Association with Private Land (Appendix Table C-8)

On these 58 allotments, utilization levels would be between 30 and 50 percent. At this level of use, soil compaction and erosion should improve. According to according to the predicted response of vegetative cover, Musgrave's soil loss model shows the improvements in erosion rate (tons/acre/year) for these allotments to range from 7 to 26 percent; the average improvement being eleven percent.

Land Treatments

A discussion of land treatment will be made, analyzing the short-term impacts of soil compaction, soil erosion, and soil productivity. Because it is not known where, when, or what method would be used, the long-term erosion rates were calculated by using the projected response of vegetative cover (Appendix Table H-1). The following discussion is based on how much and how long it would take to arrive at the long-term erosion rates.

Burning and Seeding

When fire is used as a management tool, soil moisture levels are high and temperatures are low so the fire is easier to control. Lower fire temperatures have relatively no effect on soil characteristics.

On the 172,000 acres of brush control, the surface would be virtually bare of vegetation during the first growing season, making the potential for erosion 218 percent higher than present condition. Within two growing seasons, the erosion rates should be close to the present condition, 25 percent higher than excellent condition. By the end of the third or fourth growing season, vegetative cover should be about maximum and reflect the long-term erosion rates (Appendix Table H-1). However the recovery time and responses are dependent on the range condition existing before the treatment began (see vegetative section, proposed action).

Burning and seeding on 67,000 acres would also create a potential 218 percent increase in erosion rates during the first growing season following treatment because of the increased surface disturbance. However after the second growing season, the vegetative response should be close to maximum and reflect the values in Appendix Table H-1.

All treatment areas would be rested for two grazing seasons. Almost all existing soil compaction problems would be significantly improved through frost action. Burning returns soil nutrients to the soil which act as a weak fertilizer. Ash loss through wind erosion is not expected to be significant. Increasing basal cover through land treatments increases infiltration rates (Pechance 1954) which should increase the soil's productivity capabilities by increasing the amount of available water for plant growth.

Spraying

Pechanec et. al. (1965) and Jorgensen (1971) state that soil erosion is usually not a hazard on sprayed sagebrush lands. Erosion is usually checked by dead sagebrush, litter cover and grasses. Germination of grasses and forbs following spraying increases ground cover and reduces the potential for soil erosion. According to Vale (1974), manipulation of the vegetation that preserves or increases soil cover, whether living plants or litter, would decrease erosion. Spraying range would usually have less than a one year effect on soil microorganisms. Spraying range to decrease the amount of woody plants would in the long-term, significantly decrease sheet erosion rates. Soil compaction and productivity capabilities should be similar to burning.

Chaining

Chaining juniper and woody plants has a churning effect on the surface layer. This surface disturbance can break up soil crusting, scarify seed coats, and stimulate seed germination. Despite risks of some short-termed erosion, the long-term impacts from chaining should show beneficial increases in cover and a decrease in sheet erosion rates. Anytime equipment is used on rangeland, the potential increases to channel water. The potential for rill and gully erosion is increased and, if it occurs, soil loss could be severe. If burning is done to further control shrub growth and remove excessive slash, the impacts would be similar to that discussed under the burn section. Heavy slash buildup could produce hot spots which should produce a water resistance layer. Because these areas would be small, only one or two growing seasons would be needed to alleviate this effect.

All of the soils in the proposed land treatment are producing less total annual production, or considerably more woody vegetation and less understory vegetation than the potential vegetative balance of those communities. All of the soils, except those in the Snake River Sediments (about 24,000 acres), have the productive capacity to meet the projected land treatment goals. Successful land treatment and seeding are expected on most proposed sites. The exception is the proposed treatment on the Snake River Sediments below 3,500 feet elevation. These areas have low rainfall (generally less than nine inches), sandy or silty soil textures, high profile salts, and restrictive microrelief. For these reasons, trials would be run on all proposed sites to test the results before large scale treatments are permitted. Since these areas are winter range and would never be grazed during the growing season, it is possible that land treatments followed by seeding would be successful. The results would be highly dependent on that year's soil temperature and moisture relationship.

<u>Range Improvements</u>

Springs

The procedures for developing springs would decrease compaction and erosion from present condition by locating the watering troughs 100 feet away from the water source on 90 percent of the 81 springs. Fencing the riparian area would benefit the spring by removing the effects of trampling. The actual installation would produce a one time, short-term increase in sediment. Because spring development helps distribute grazing uniformly over an allotment or pasture, the net effects on soil compaction, erosion, vegetative cover, and trampling are greater than on the 1.5 acre size of an average spring. Bringing all existing spring developments up to these standards wherever possible, would further decrease the adverse impacts of grazing.

Reservoirs

Constructing 90 reservoirs would disturb approximately 180 acres. The two acres disturbed at each reservoir site would be stripped of vegetation and the soil profiles would be all or partially removed. Due to the crusting nature of soil, the compacting force of the heavy equipment, and the reservoirs being filled with water, the construction sites should not contribute significantly to increasing long-term erosion or sediment yield (see watershed section). The short-term impacts would be a few years of increased erosion resulting in downstream sedimentation. The long-term impacts can be beneficial by helping to stabilize upstream drainage channels. During the first year, the erosion rates on the 180 acres would be approximately 218 percent higher. Within three years, the erosion rates should be stabilized and close to that of the surrounding area.

Pipelines

Most pipeline construction areas are associated with the development of a new service road. Installing a mile of pipe with a service road removes 2.5 acres of topsoil. The impact on this 2.5 acres would be increased compaction, decreased fertility, loss of production, and the potential for yearly wind and water erosion. Just after construction, the soil is subject to wind and water erosion. After the first year, crusting, settling and reestablishment of vegetation would occur, decreasing the adverse impacts. However, since the maintenance roads would be used annually, and the topsoil removed, the long-term effects would be an increased susceptibility to wind and water erosion.

Summary

The proposed action would meet the objective of improving watershed conditions in the ORA. Although research has not shown any significant change in infiltration rates, runoff, or soil erosion when comparing different grazing systems, a significant change does occur when comparing grazing intensity and vegetative cover to these watershed functions. For these reasons, the 50 percent utilization-moitoring system would provide a good method for regulating grazing intensity. Postponing turn out dates approximately two weeks on 44 allotments would decrease the potential and amount of soil compaction and soil erosion. According to Musgrave's analysis, the long-term decrease in erosion rates from improved vegetative condition and increased cover would be an average of nine percent (1.12 tons/acre/ year to 1.02 tons/acre/year). This is approximately sixteen percent higher than the erosion rates of optimum (excellent) condition watershed.

Project developments would be generally beneficial. Land treatment would cause short-term soil loss but would improve the long-term erosion conditions.

WATER RESOURCES

Impacts of the proposed action and alternatives on water resources were analyzed on 29 allotments. Each allotment was analyzed based on predicted changes in erosion rates, ground cover, range condition, and land treatment acreages (Table 4-7). These allotments represent the range of responses anticipated in all allotments.

Watershed Condition

An analysis of selected allotments (Table 4-7) indicates a slight overall improvement in upland watershed condition. A slight to moderate decrease in erosion is anticipated on nearly 50 percent of the observed allotments with no changes predicted for the remainder. It is estimated that considerably less than 50 percent of this soil movement would contribute to sediment yield (Johnson 1980). For a more complete discussion of erosion and sediment problems refer to the soils and aquatic wildlife sections.

Grazing systems showing an increase in ground cover can be expected to reduce runoff (Branson et. al. 1978). A decrease in the quantity of overland flow should reduce the energy available for sediment movement and transport of contaminants to streams (Gifford et. al. 1976; Rauzi and Hansen 1966).

Construction of 81 springs would create a short-term increase of sediment released into drainage systems. Fencing 90 percent of these

Table 4-7
Summary of Projected Changes in Watershed Conditions on
Allotments Important to Water Resources *

Allot. No.	Proposed Action: Erosion	Proposed Action: Ground Cover	Proposed Action: Range Condition	Proposed Action: Land Treatment	Proposed Action: Overall Water-shed Rating	Alternative #1: Erosion	Alternative #1: Ground Cover	Alternative #1: Range Condition	Alternative #1: Overall Water-shed Rating	Alternative #2: Erosion	Alternative #2: Ground Cover	Alternative #2: Range Condition	Alternative #2: Overall Water-shed Rating	Alternative #3: Erosion	Alternative #3: Ground Cover	Alternative #3: Range Condition	Alternative #3: Overall Water-shed Rating	Alternative #4: Erosion	Alternative #4: Ground Cover	Alternative #4: Range Condition	Alternative #4: Land Treatment	Alternative #4: Overall Water-shed Rating	Alternative #5: Erosion	Alternative #5: Ground Cover	Alternative #5: Range Condition	Alternative #5: Land Treatment	Alternative #5: Overall Water-shed Rating
Intensive Management																											
505	+	+	0	++	+	+	+	0	+	++	++	0	++	++	++	+	++	+	0	0	++	+	++	++	++	++	++
509	+	+	+	+	+	+	+	0	+	+	++	0	+	+	++	++	++	+	0	+	+	+	+	++	++	++	++
515	0	0	++	+	+	+	+	++	+	+	+	+	+	+	+	++	+	0	0	+	+	0	++	++	++	++	++
516	+	+	++	++	+	+	+	0	+	0	0	0	0	++	++	+	++	+	0	++	++	+	+	+	++	++	+
525	0	0	0	++	+	+	+	0	+	0	0	0	0	0	0	+	0	0	0	0	++	+	0	0	-	++	0
531	0	0	0	++	+	+	+	0	+	0	0	0	0	+	+	+	+	0	0	0	++	+	-	-	0	++	0
534	+	+	++	++	+	+	+	0	+	0	0	0	0	+	++	++	++	+	0	+	++	+	+	+	0	++	+
535	+	+	0	0	+	+	+	0	+	0	0	0	0	++	++	+	++	+	0	0	0	0	+	+	0	0	0
556	0	0	0	+	+	+	+	0	+	0	0	0	0	+	+	++	+	0	0	0	+	0	0	0	++	++	+
571	0	0	0	+	+	+	+	0	+	+	+	0	+	+	+	+	+	0	0	0	+	0	+	+	+	+	+
578	0	0	0	0	0	+	+	0	+	0	0	0	0	++	++	+	++	0	0	0	0	0	+	+	0	0	0
580	0	0	+	+	+	+	+	0	+	0	0	0	0	+	+	+	+	0	0	0	+	0	0	0	0	++	0
585	0	0	0	0	0	+	+	0	+	0	0	0	0	+	+	0	+	0	0	0	0	0	-	-	-	0	-
602	0	0	0	0	0	+	+	0	+	0	0	0	0	+	+	+	+	0	0	0	0	0	-	-	-	++	-
Less Intensive Management																											
558	0	0	++	++	+	+	+	0	+	0	0	0	0	+	+	+	+	0	0	++	++	+	0	0	0	++	0
561	+	+	+	++	+	+	+	0	+	++	++	0	++	++	++	+	++	+	0	+	++	+	++	++	++	++	++
586	0	0	+	++	+	+	+	0	+	0	0	0	0	+	+	+	+	0	0	+	++	+	-	-	0	++	0
592	0	0	0	0	0	+	+	0	+	0	0	0	0	+	+	+	+	0	0	0	0	0	0	0	0	++	0
Management With Private Lands																											
463	++	++	0	0	+	+	+	0	+	0	0	0	0	++	++	0	++	++	++	0	0	+	++	++	0	0	+
466	++	++	0	0	+	+	+	0	+	0	0	0	0	++	++	0	++	++	++	0	0	+	++	++	0	0	+
472	++	++	0	0	+	+	+	0	+	0	0	0	0	++	++	0	++	++	++	0	0	+	++	++	0	0	+
477	++	++	0	0	+	+	+	0	+	0	0	0	0	+	++	0	+	+	++	0	0	+	+	++	0	0	+
483	++	++	+	0	++	+	+	0	+	0	0	0	0	++	++	+	++	++	++	+	0	+	++	++	0	0	+
486	++	++	0	0	+	+	+	0	+	0	0	0	0	++	++	0	++	++	++	0	0	+	++	++	0	0	+
487	++	++	0	0	+	+	+	0	+	0	0	0	0	++	++	0	++	++	++	0	0	+	++	++	0	0	+
511	+	0	0	++	+	+	+	0	+	0	0	0	0	+	+	0	+	0	0	0	++	+	-	-	0	++	0
607	0	0	+	++	+	+	+	0	+	0	0	-	0	+	+	0	+	0	0	+	++	+	-	-	-	++	-
609	0	0	0	0	0	+	+	0	+	++	++	0	++	+	+	0	+	0	0	0	0	0	++	+	0	0	+
620	0	0	+	0	+	+	+	0	+	0	0	0	0	+	+	+	+	0	0	+	0	0	0	0	0	0	0
Alternative Summary					+				+				0				++					0 to +					0 to +

Erosion:
- 0 is less than 10% change in erosion
- \+ is a 10-19% reduction in erosion
- \- is a 10-19% increase in erosion
- ++ is more than 20% reduction in erosion
- -- is more than 20% increase in reduction

Range Condition:
- 0 is less than 13% change in range condition
- +,- is 13-24% change in range condition
- ++,-- is more than 25% change in range condition

Ground Cover:
- 0 is less than 5% change in ground cover
- +,0 is 5-9% change in ground cover
- ++,-- is more than 10% change in ground cover

Land Treatment:
- 0 is less than 10% of allotment acreage treated
- \+ is 10-19% of allotment acreage treated
- ++ is more than 20% of allotment acreage treated

* Allotments analyzed lie on or adjacent to streams, characterized by high or low susceptibility to sheet erosion and/or they represent extremes in predicted responses to changes in erosion rates and/or ground cover.

springs would improve the riparian vegetation cover and restrict animal use to areas more resistant to damage by trampling. Fencing in combination with piping water to a trough would improve water quality at the spring and the water site (trough). The impact area for each spring development is estimated to be 1.5 acres, creating an overall watershed improvement on 110 acres (one percent of existing riparian/meadow vegetation type).

Construction of 90 reservoirs would yield short-term discharge of sediment into the drainage below the reservoir. A large portion of the disturbed soil would be trapped in the reservoir. Most of the increased downstream sediment would be redeposited a short distance from the construction site on ephemeral drainages. Water quality would be improved by protective fencing and trough placement at 80 percent of the reservoir sites. Fencing would also allow establishment of riparian vegetation. This increased ground cover would stabilize the drainage and slow runoff resulting in sediment deposition. The impact area for each reservoir is estimated to be two acres, providing an overall watershed improvement on 144 acres (1.5 percent of existing riparian/meadow vegetation type).

Fencing would have little impact on water quality except for 64 miles of stream to be fenced. Keeping animals out of the stream channel may reduce fecal coliform bacteria depending on the number of animals and their access to streams (Stephenson and Street 1977).

Land treatment projects would have a short-term negative impact on watershed condition through decreased vegetation cover and increased runoff on 239,000 acres. A long-term beneficial impact would result as ground cover increases causing reduced runoff (Lusby 1979).

Proposed land treatments would be accomplished by one of three methods: burning, chaining, or spraying. Of these three methods, burning would have the greatest short-term, negative impact on watershed condition. This is because little litter would remain for soil protection. Spraying would have the least impact on watershed condition due to the protective cover of litter and remaining standing dead vegetation.

Water Availability

Development of 81 springs and 90 reservoirs would improve the distribution and increase the amount of water available for use by livestock and wildlife. Livestock access to stream channels would be reduced by fencing. Water gaps would be established at various points along streams to permit livestock watering.

The estimated annual yield from the proposed springs and reservoirs is 150 acre-feet and 180 acre-feet respectively. These represent a combined increase of about 47 percent in available water in developed springs and reservoirs.

A lack of specific information about each spring makes analysis difficult. Generally, the smaller the groundwater storage, the shorter the duration of water flow. Development of smaller springs may cause them to dry up a week or two early. Most perennial springs should maintain their flow after development.

Reservoir construction would have a slight negative impact on downstream water users in terms of water availability. Reservoirs located on ephemeral drainages within the Snake River waterbed would retain an amount of water representing 0.11 percent (107 acre-feet) of the total annual water yield for that area. Reservoirs on the Owyhee River watersheds would retain 0.02 percent (63 acre-feet) of the total annual water yield for those watersheds. Retaining this relatively small amount of water is not expected to cause a significant impact to downstream users who take water from the Snake and Owyhee rivers.

Runoff from spring snowmelt plays an important role in the EIS area by supplying water for irrigation. The general watershed improvement expected by the proposed action would create changes in the timing of stream flow. Peak flows during spring runoff would be reduced as more time would be required for the water to reach stream channels. Summer flows would be prolonged or increased as this water from snowmelt eventually reached the stream channels. Total annual water yield for the area is not expected to be significantly affected. The overall impact of this change in flow timing would be a slight decrease in the quantity of water available for irrigation and filling reservoirs in the spring, and a slight increase in summer stream flows.

Water Use

Overall water consumption by grazing animals would increase 25 percent in 20 years, or from 31 acre-feet to 156 acre-feet annually (0.04 percent of total annual water yield).

Water needed for irrigation purposes is not expected to change from that presently used, but the amount of water available in the spring is expected to decrease slightly.

Summary

Overall watershed conditions would be slightly improved by reduced erosion rates, an increase in ground cover due to improved range condition, and an increase in ground cover from land treatment projects. Fencing of spring developments and reservoirs would improve an area equivalent to 2.5 percent of the current acreage of meadow/riparian vegetation type.

Spring and reservoir construction would increase the amount of water available to livestock and wildlife by about 47 percent over current available water in such developments. Construction of reservoirs would retain 0.02 percent (63 acre-feet) of the total annual water yield of the Owyhee River watersheds and 0.11 percent (107 acre-feet) of the Snake River watershed's total annual production.

Improved watershed conditions would cause the runoff from spring snowmelt to be spread over a longer time than presently occurs. This may cause a slight reduction in the amount of water available for irrigation and the filling of reservoirs in the spring.

TERRESTRIAL WILDLIFE

Introduction

Wildlife respond to various environmental factors which can critically affect their condition and population growth. Four essential factors needed for all wildlife are quality and quantity of food, water, space, and cover, which includes nesting, fawning, brood rearing, escape and loafing cover. Specific wildlife population numbers fluctuate in response to the most limiting of these factors. Changes imposed by the proposed action on these limiting factors would provide an opportunity for wildlife populations to increase or decrease.

Tables 4-8 through 4-10 analyze the impacts that are expected to occur to mule deer, antelope, bighorn sheep and sage grouse from the proposed action. The methodology used in predicting the impacts to wildlife habitat is described in Appendix J (Wildlife Habitat Analysis and Impact Prediction Method).

Mule Deer

The impacts on the EIS area mule deer population would be reflected in changes to the winter and summer habitat condition. These changes would result from proposed altering of livestock stocking rates, grazing systems, season-of-use, and range manipulation (Table 4-8).

The overall reduction of livestock AUMs on mule deer range is expected to substantially improve grass, forb and shrub vigor. A gradual improvement in mule deer diet would result as range condition and trend improve on the majority of the allotments. The above, coupled with the 50 percent vegetation utilization limits by livestock should allow greater vegetative productivity and improve species composition.

The implementation of grazing systems is generally expected to contribute to the improvement of mule deer habitats. Intensive grazing management is proposed for 93 percent of mule deer habitat. About 50 percent of this area would not be grazed by livestock prior to June 15. Although deer are not expected to move from grazed to ungrazed areas (Skovlin 1976), the deer that normally occupy the ungrazed area should benefit from improved nutrition during late gestation period. Deer occupying areas being grazed during the spring should not be severely impacted since 50 percent utilization limits are proposed in these areas.

Proposed rest rotation and deferred rotation have rested pastures built into their systems. There are 56 rest rotation or deferred systems designed to establish and promote reproduction and establishment of seedlings of all palatable forage species.

Table 4-8

IMPACTS TO WILDLIFE
Mule Deer

Proposed Action Component	Habitat Affected (Acres)	Impact on Habitat	Allotments	Remarks
Forage Allocation	829,700	+++	All allotments	The average reduction of livestock AUMs by 31% would improve grass, forb & shrub vigor. The 50% vegetation utilization levels by livestock would improve quantities of palatable forage.
Grazing Management				
Intensive Management	85,500-SU 93,800-Wt	+++	508, 509, 515, 541, 548, 570, 590, 597	The major proportion of each of these allotments is expected to reach good ecological condition. This would give deer optimum habitat condition and a quality diet.
	217,000-SU 205,300-Wt	++	450, 500, 502, 503, 507, 508*, 514, 517, 518, 519, 521, 522, 525, 526, 529, 530, 531, 532, 534, 539, 540, 546, 549, 550, 551, 554, 556, 562, 573, 574, 580, 581, 587, 588, 589, 593*, 599, 600*, 601, 603	These allotments are not expected to reach optimum condition but would improve moderately over the present condition. Increased productivity of grasses and shrubs would benefit deer.
	90,200-SU 68,600-Wt	+	501*, 505, 506*, 516*, 533*, 536*, 542*, 552, 563, 565*, 569*, 579*, 595*, 602	The existing situation is expected to improve only slightly. Vegetation vigor would be slow in its response to reductions and systems.
	14,400-Wt	---	557*, 571*, 572*	Little if any vegetative improvement is expected in these allotments. In addition, livestock grazing of shrubs during the fall and/or winter would conflict with the limited palatable browse available to deer.
Less Intensive Management	4,500-SU 2,900-Wt	+++	564	Due to the proposed grazing action, these allotments are expected to improve significantly and provide optimum habitat conditions for mule deer.
	11,400-SU 6,400-Wt	++	520, 558, 560, 561, 576, 586, 594	These allotments are expected to improve above the present conditions with more forage available for deer.
	4,800-SU 600-Wt	+	510*, 544*, 576*, 591*, 592*, 596*	Habitat conditions would improve slightly but would lack the vegetation vigor and productivity found in better habitat conditions.
	2,000-Wt		598*	The production on this allotment would have an adverse impact on deer populations. These impacts stem from livestock grazing on deer winter range, depleting browse needed by the wintering deer herds.
Management with Private Lands	22,300	Unknown	453-459, 461, 463-467, 469-473, 476, 477, 479, 483, 485-487, 491, 492, 504, 511, 515, 523, 537, 543, 545, 566, 567, 575, 577, 582, 607-609, 610-613, 616, 618-621, 623-627	Management of the scattered public lands in these allotments would be generally controlled by private land owners, therefore, impacts could not be predicted.
Range Improvements				
Spring Devlopment	81 springs	++	502, 506, 508, 515, 516, 521, 525, 529, 530, 531, 533, 539, 541, 548, 549, 550, 551, 554, 557, 565, 573	Approximately 90% of the spring developments will be fenced. Each enclosure would be approximately 1.5 acres in size. These areas would provide improved habitat for deer.
Reservoir Development	66 reservoirs.	++	500, 514, 516, 517, 519, 522, 532, 533, 534, 539, 540, 541, 546, 548, 549, 550, 551, 554, 556, 565, 587, 593, 603	Approximately 80% of the reservoirs would be fenced. Water storage would range from 1 to 2 acre-feet. Additional water and forage would be made available to mule deer.
Pipelines	18 miles	+	508, 517, 521, 525, 531, 532, 565	Water sources would be provided on every mile of pipeline. This would increase the availability of water to deer providing the systems remain charged during the dry period.
Vegetation Treatments	239,000	++	All allotments would have some vegetation treatments with the exception of 592, 593, 582, 612.	Vegetation treatments are generally proposed for dense, montypic stands of big sagebrush and juniper. Opening up these stands would benefit deer because deer cover requirements would be incorporated in the design and implementation of these projects.
Fences	198 miles	No Impact		It is not expected that fencing would have an impact on the deer herds, because fences would incorporate designs to facilitate passage.

* = These allotments were reduced one condition class because of fall livestock grazing on mule deer winter range.
___ = These allotments support high concentrations of deer during winter seasons.

+++ = highly beneficial, ++ = moderately beneficial, + = slightly beneficial, --- = adverse.
SU = summer range, Wt = winter range.

As a result of the proposed action, 23 allotments in deer winter range would have late summer and fall livestock grazing (Table 4-8). This season-of-use conflict would cause an overuse of palatable browse by livestock and deer. Within this area, 16,400 acres are presently in poor ecological condition and not expected to improve. Adverse physiological impacts are expected in this area due to nutritional stress from depleted browse and other forage needed by the wintering deer herd.

Since mule deer require daily water, proposed reservoirs and pipelines would benefit mule deer distribution in areas currently lacking adequate water sources. Fencing (to exclude cattle but permit mule deer passage) of 80 percent of the reservoirs and 90 percent of the springs would enhance the availability of succulent vegetation to mule deer. Therefore, declining deer herds are expected in these areas.

The 64 miles of riparian habitat protective fencing should increase forage quality as condition of these areas improves. Fenced areas should also provide better cover for mule deer along these streams. The fences would be built to allow mule deer passage.

Adverse impacts to mule deer habitat from vegetation manipulations are not expected to occur due to coordination measures described in the proposed action. Range treatment of juniper would cause removal of overstory competition leading to an increase in grass and forb production, and improved plant composition. Valuable edge would also be created, benefiting mule deer. The manipulation of dense stands of big sagebrush in poor condition is also expected to improve species diversity and would benefit the mule deer diet.

There are 198 miles of new fence proposed within mule deer habitat. This would present an additional hazard to deer. However, the impact on the population is considered insignificant because these fences would incorporate designs to facilitate passage.

Currently, five percent of the 413,400 acres of public land making up the mule deer summer range is in good ecological condition. Of the summer range, 22 percent is expected to be in good condition from the proposed action (Table 2-12). This should improve the availability of preferred forage plants and the nutritional condition of mule deer.

On the 394,000 acres of public mule deer winter range, the good ecological condition class is expected to increase from seven percent to 24 percent with the proposed action (Table 2-12). In addition, approximately 85,600 acres are expected to improve slightly but would remain in poor condition (Table 4-8).

Range condition in unfenced meadows and riparian habitats, important as mule deer fawning areas, is expected to make little improvement (Table 4-5). Livestock would continue to concentrate in these areas even with reduced stocking rates, utilization limits and grazing systems.

Antelope

The proposed action is expected to impact the antelope population in the EIS area based on predicted vegetative changes and effects of cover and forage competition between antelope and livestock (Table 4-9).

The overall 31 percent reduction in livestock AUMs and 50 percent vegetation utilization limits by livestock would increase food and fawn protection cover. Carrying capacities would increase and nutritional stress would be reduced as the quality and quantity of important antelope forage plants increased.

Rest rotation and deferred rotation grazing systems would have beneficial impacts to antelope habitat. These systems provide pastures that would not be grazed, or only grazed part of the season. Pyrah (1973) found that antelope move from grazed to ungrazed areas thus taking full opportunity to obtain preferred forage species. Intensive grazing management is proposed on 95 percent of the antelope habitat. Within this area, 50 percent of this habitat would not be grazed prior to the end of the fawning period (June 15). This should create additional productivity and fawn survival.

The development of new sources of water (reservoirs and pipelines) is expected to moderately benefit antelope. The development of springs is not expected to change the availability of water to antelope, thus no impact is expected.

Adverse impacts from vegetation manipulation are not expected to occur to antelope because of coordination measures described in the proposed action. Proposed manipulation of dense stands of tall sagebrush would open up areas for antelope. Such treatments would reduce shrub competition and allow improvement in species diversity, species composition, and resultant forage quality.

The addition of 167 miles of fence within antelope habitat would increase the hazard to antelope in spite of adherance to BLM specifications. However, this impact could be very slight.

Overall, the proposed action would benefit the antelope population in the EIS area. There are 427,500 acres of antelope habitat on public land (Appendix Table J-2) of which five percent or 24,100 acres, is in good ecological condition. Under the proposed action, 44 percent (190,000 acres) is expected to reach good condition which would be beneficial to herd productivity and fawn survival (Table 2-12).

Bighorn Sheep

Bighorns occur only in pasture 26 of allotment 551. The proposed livestock grazing treatment (grazed every other year from mid-April to June), the 25 percent reduction in livestock AUMs and the 50 percent utilization limits within this area are expected to bring increased vigor and productivity to bluebunch wheatgrass, a key forage species for bighorn. Table 2-12 illustrates the changes in ecological condition that are expected to result from the proposed action. About 500 acres (25 percent) of the fair condition class is expected to move into the

Table 4-9

IMPACTS ON WILDLIFE
Antelope

Proposed Action Component	Habitat Affected (Acres)	Impact on Habitat	Allotments	Remarks
Forage Allocation	438,100	+++	All allotments	The overall 31% decrease in livestock AUM's on antelope range is expected to increase available forage. Plant vigor and productivity should increase.
Grazing Management				
Intensive Management	184,300	+++	505-509, 514-516, 518, 519, 521, 522, 525, 526, 530 533, 534, 541, 542, 548, 557, 562, 565, 573, 579, 587, 589, 590, 597, 600, 603	The major portion of antelope habitat in these allotments is expected to reach good ecological condition. Plant composition, productivity and vigor should be optimum for antelope.
	119,600	++	500, 503, 529, 531, 532, 536, 539, 540, 546, 549, 550, 554, 556, 563, 569, 574, 581, 585, 588, 602	Improvement in these allotments is expected to benefit antelope but would not reach an optimum level. Productivity and vigor of vegetation would increase over present condition.
	110,800	+	517, 535, 552, 553, 557, 571, 572	These allotments are expected to improve slightly but vegetation composition, productivity and vigor would not reach needed lèvels to avoid forage competition between livestock and antelope for palatable species.
Less Intensive Management	5,700	+++	558, 561, 564, 576, 586	Optimum vegetative conditions are expected to be achieved on these allotments.
	3,700	++	510, 544, 591, 592, 596	These allotments are not expected to reach the optimum levels of vegetation vigor and species availability. They would, however, improve over present conditions.
	3,400	+	559, 598	These three allotments are expected to improve only slightly above present conditions.
Management with Private Land	10,600	Unk	454, 456, 461, 463, 465, 466, 469, 472, 476, 477, 485, 487, 491, 504, 515, 523, 537, 545, 566, 567, 575, 582, 607, 608, 610, 612, 613, 623, 626, 627.	Management of these allotments would be largely controlled by private land holders, therefore, no impact on antelope range was estimated.
Range Improvements				
Spring Development	42 springs	No Impact	506, 508, 515, 516, 521, 525, 529, 530, 531, 533, 539, 541, 548, 549, 550, 551, 554, 557, 565, 573.	No change in the availability of water to antelope is anticipated.
Reservoir Development	56 reservoirs	++	500, 514, 516, 517, 519, 522, 532, 533, 534, 539, 540, 541, 546, 548, 549, 550, 551, 554, 556 565, 587, 593, 603.	Since antelope require daily water, they are expected to benefit from the creation of water sources which would expand their range.
Pipelines	16 miles	++	508, 517, 521, 525, 531, 532, 565	The development and installation of troughs on pipelines is expected to improve water availability if the system remains charged during the dry season.
Vegetation Treatments	239,000	++	All allotments are proposed for some vegetation treatments with the exception of 592, 612.	The removal of dense stands of tall sagebrush is expected to extend antelope range and forage resources.
Fences	167 miles	No Impact		It is not expected that fencing would have a significant impact on the antelope, because fences woild incorporate designs that allow antelope passage.

+++ = highly beneficial, ++ = moderately beneficial, + = slightly beneficial.
Unk = Unknown

good condition class. This change is not expected to significantly influence the bighorn population.

No vegetative manipulations or fences have been proposed within bighorn habitat. One spring proposed for development is located in an important bighorn use area. The development of this spring could cause the local overuse of forage important to bighorns.

Sage Grouse

The proposed allocation of forage and the 50 percent utilization limit should significantly improve nesting habitat (Table 4-10). However, minimal improvement to unfenced meadows and riparian habitats important to sage grouse broods is expected. Livestock would continue to make concentrated use of these areas regardless of stocking rates (Platts and Rountree 1972).

Rest rotation grazing systems proposed in sage grouse habitat are more compatible with sage grouse than the other proposed systems. In the three-pasture, rest rotation systems, no livestock use would be made of 66 percent of sage grouse habitat during the nesting and brood rearing seasons. In the four-pasture, rest rotation system, 75 percent of the habitat would be undisturbed during incubation and 50 percent during brood rearing.

Proposed deferred rotation grazing systems would generally result in 50 percent of the sage grouse habitat in the allotments not being grazed during the nesting and early brood rearing season. This would benefit sage grouse by insuring that the understory vegetation cover is not grazed too heavily and that no livestock/sage grouse disturbance conflicts occur from livestock concentrations in nesting habitat.

However, proposed season-long grazing systems would allow livestock to graze in sage grouse habitats during the nesting and brood rearing seasons.

There are 79 reservoirs proposed in sage grouse habitat which would provide additional sources of water. Proposed fencing of reservoirs (80 percent) would increase vegetation, insect biomass and provide about 65 acres of quality brood habitat.

Exclosures built in conjunction with spring developments are expected to increase vegetation, insect abundance and provide about 60 acres of quality brood habitat.

Of the proposed 64 miles of riparian habitat protective fencing, five miles are within sage grouse habitat. This action should add about 35 acres of quality brood rearing habitat.

There are fifteen miles of pipeline proposed in sage grouse habitat. These new water sources should improve sage grouse distribution since the coordination measures described in the proposed action alleviate potential adverse impacts.

Table 4-10

IMPACTS TO WILDLIFE
Sage Grouse

Proposed Action Component	Habitat Affected (Acres)	Impact on Habitat	Allotments	Remarks
Forage Allocation	620,950	+++	All allotments	The 31% reduction in livestock AUMs would have positive impacts on the sage grouse population by increasing understory vegetation densities that are important for nesting cover and food
Grazing Management				
Intensive Management	94,800-Nesting 101,100-Other	+++	508, 509, 515, 516, 541*, 548*, 570, 590 593, 600	These allotments are expected to provide optimum sage grouse habitat. Improved cover would increase nesting success and decrease brood mortality. More succulent vegetation would also be available to grouse.
	94,800-Nesting 240,600-Other	++	450, 500, 501, 502*, 503, 506, 507, 514, 517, 518, 519, 521, 525, 526*, 529, 530, 531*, 532, 533, 534*, 535, 536, 539, 540 542, 546*, 549, 565*, 569, 570, 572*, 573*, 574, 580*, 581*, 585, 587, 588,	These allotments are not expected to reach optimum conditions but are expected to increase and improve nesting & brooding cover. Forbs and other grasses would not be readily available.
		+	589, 595*, 597, 599, 601, 603	
	44,500-Nesting 64,400-Other		505*, 552, 553*, 557, 563, 602	Sage grouse habitat in these allotments is expected to improve slightly. Forbs and other succulent vegetation would be limited.
Less Intensive Management	2,400-Nesting 2,100-Other	+++	564	This allotment is expected to improve significantly and provide optimum habitat conditions for sage grouse.
	6,100-Nesting 4,900-Other	++	510, 520, 544, 558, 559, 560, 561, 564*, 576, 586, 591, 592, 594, 596	Allotments in this condition class are not expected to provide optimum habitat, however, nesting and brood cover is expected to increase from present conditions.
	2,850-Nesting 1,300-Other	+	598	This allotment would show a slight improvement but would be lacking in the vegetative components necessary for nesting and brood rearing.
Management with Private Lands	7,100-Nesting 11,800-Other	Unk	453, 454, 455, 456*, 457*, 459*, 461*, 463, 464, 465, 466*, 467, 469*, 470, 471, 472, 476*, 477, 479, 483*, 485, 487, 491* 492, 504, 511, 515, 523*, 537*, 543, 545, 566, 567*, 575*, 582, 606, 607*, 608*, 609, 610, 611*, 612, 613*, 616*, 618, 619 620, 621, 623, 624*, 625*, 626, 627*.	Management of these allotments would be mainly controlled by private land holders. No impact on sage grouse habitat was estimated.
Range Improvements				
Spring Development	70 springs	++	502, 506, 508, 515, 516, 521, 525, 529, 530, 531, 533, 539, 541, 548, 549, 550, 551, 554, 557, 565, 573.	The positive impacts of fencing spring heads to improve sage grouse brood rearing habitat should outweigh the negative impacts associated with removing a portion of the water to supply livestock water.
Reservoir Development	79 reservoirs	++	500, 514, 516, 517, 519, 532, 533, 534, 539, 540, 541, 546, 548, 549, 550, 551, 554,556, 565, 587, 593, 603.	With the development of the reservoirs, sage grouse distribution would be increased during summer periods of limited water. Fenced reservoirs would also provide increased brood rearing habitat.
Pipelines	15 miles	+	508, 517, 521, 525, 531, 532, 565	Providing water sources at one mile intervals is expected to improve sage grouse distribution, provided systems remain charged throughout the dry period.
Vegetation Treatments	239,000	++	All allotments proposed for some vegetation treatments with the exception of 542, 593, 583, 611.	Vegetation treatments are generally proposed for areas of dense sagebrush cover with either suppressed or severely depleted understories. In general, these areas are presently providing poor quality sage grouse habitat. By incorporating sage grouse habitat requirements into the design and implementation of range treatments, the proposed treatments should generally benefit sage grouse.

*These allotments contain meadow complexes that provide sage grouse brood rearing habitat. Almost all of this habitat is on private land and management is controlled by land owners.

+++ = highly beneficial, ++ = moderately beneficial, + = slightly beneficial.

Range treatments are proposed in important sage grouse habitat (nesting, brood rearing and wintering). Adverse impacts to these areas from vegetation manipulation are not expected to occur due to coordination measures described in the proposed action.

All actions (forage allocation, grazing systems, season-of-use and treatments) proposed are expected to significantly improve sage grouse nesting habitat. Currently, of the 187,600 acres of the identified nesting habitat on BLM land, four percent (7,400 acres) are in poor ecological condition (Appendix Table J-2). The proposed action is expected to change 21 percent (39,400 acres) of the nesting habitat into good ecological conditions (Table 2-12). This situation should produce a significant increase in nesting success.

The contribution of fenced brood habitats and the implementation of grazing systems which permit grazing at times other than the brood rearing season are expected to moderately improve brood habitat.

Waterfowl

The proposed action would affect waterfowl populations through the impacts of livestock use of emergent, shoreline and upland vegetation and the impacts of livestock trampling on nest sites. Since waterfowl usually nest near stock ponds and cattle tend to concentrate near water, impacts on habitat around existing reservoirs and ponds would be similar to present conditions.

The implementation of rest rotation grazing systems with 50 percent utilization limits is expected to improve habitat conditions for waterfowl. Gjersing (1975) found that duck production increases in pastures under rest rotation grazing and pair populations generally increased in pastures grazed in the spring or rested the previous year. Populations would decrease, however, in pastures grazed in the fall or late summer where the removal of vegetation would limit next years nesting cover (Kirsh 1969).

Waterfowl nesting and production are keyed to the upland habitat condition around livestock ponds and drainages (Lokemoen 1973). Nesting and brood rearing habitat would increase from the development of 90 reservoirs in the EIS area. Of these reservoirs, 80 percent would be fenced, decreasing nest disturbance and increasing aquatic food plants. Those unfenced reservoirs would serve primarily as resting areas for resident and migrating waterfowl.

The proposed development of 90 reservoirs would increase the surface water of the area. Fencing 80 percent of the reservoirs and implementation of rest rotation grazing systems would increase the riparian and upland habitat, ultimately increasing waterfowl nesting and brood rearing habitat of the EIS area.

Meadow/Riparian Associated Wildlife

The proposed action is expected to improve 88 miles of riparian habitat from poor to fair condition (Table 4-11). The increase in herbaceous and willow cover provided by this change is expected to moderately benefit valley quail, mountain quail, small mammals, and passerine bird habitat. Beaver and river otter habitat is expected to benefit slightly.

Fencing is proposed for 64 miles of riparian habitat. These areas are expected to improve to a good ecological condition (Appendix Table K-9). The increases in the amount and variety of shrubs is expected to be moderately beneficial to quail, beaver, river otter, small mammals and passerine birds. The addition of trees would provide new habitat for hawks, particularly Cooper's and sharp-shinned and owls (great horned, long-eared, and screech).

The remaining 270 miles are expected not to change or provide only slight improvement to riparian associated wildlife.

Reservoir and spring developments proposed to be fenced, would increase vegetative diversity and subsequently provide a small amount of high quality habitat, creating population increases for quail, small mammals, and passerine birds.

Summary

Mule Deer

As a result of the proposed action, mule deer habitats and population numbers are expected to increase dramatically in most locales in the EIS area. It is estimated that the amount of acreages in good ecological condition on the deer winter and summer ranges would increase by three times and four times respectively. These areas in good condition would provide a quality diet for deer. The 50 percent reduction in the existing amount of poor ecological condition on the deer ranges would also substantially improve habitat conditions. Season-of-use conflicts would continue on nine percent of the deer winter range where livestock are permitted to graze in the fall. The critically important habitat in these areas is not expected to improve and may decline from livestock/deer competition for palatable browse species.

Deer populations are expected to meet the objectives of the proposed action. However, animal conditions would vary due to the different levels of ecological condition that would be achieved.

Antelope

Antelope habitat and populations are expected to increase from the proposed action. As shown in Table 2-12, the amount of antelope range in good ecological condition is predicted to increase by nearly nine times. Poor condition range is expected to decrease by 53 percent. These improvements would increase forage and cover values and allow the population objectives of the proposed action to be met.

Bighorn Sheep

The proposed livestock use within the bighorn range would allow bighorn populations to meet the objectives of the proposed action.

Existing habitat conditions are satisfactory (69 percent in good and 26 percent in fair). The proposed action should result in further improvement of habitat condition (75 percent in good ecological condition).

Sage Grouse

The proposed action is expected to improve sage grouse nesting habitat. Acreage in the good ecological class is predicted to increase over six times and the poor class would be reduced by 58 percent. This would increase understory vegetation, which is so critically important for nesting cover.

The proposed action is also expected to increase habitat condition associated with brood rearing areas. As a result, sage grouse objectives in the proposed action would be met.

Waterfowl

The proposed action is expected to increase water area in the EIS area through the creation of 90 new reservoirs. The proposed action also improves habitat by fencing 80 percent of the new reservoirs and 64 miles of other riparian habitat. Waterfowl populations are expected to increase.

Meadow/Riparian Habitat

As illustrated in Table 2-12, acreages of riparian habitat now in poor ecological condition would be reduced 61 percent. This would improve the quantity and quality of those vegetative species important to wildlife, especially small mammals and birds. The significantly improved areas would be the result of fencing programs. Where protective fences are not built, only slight improvement is expected.

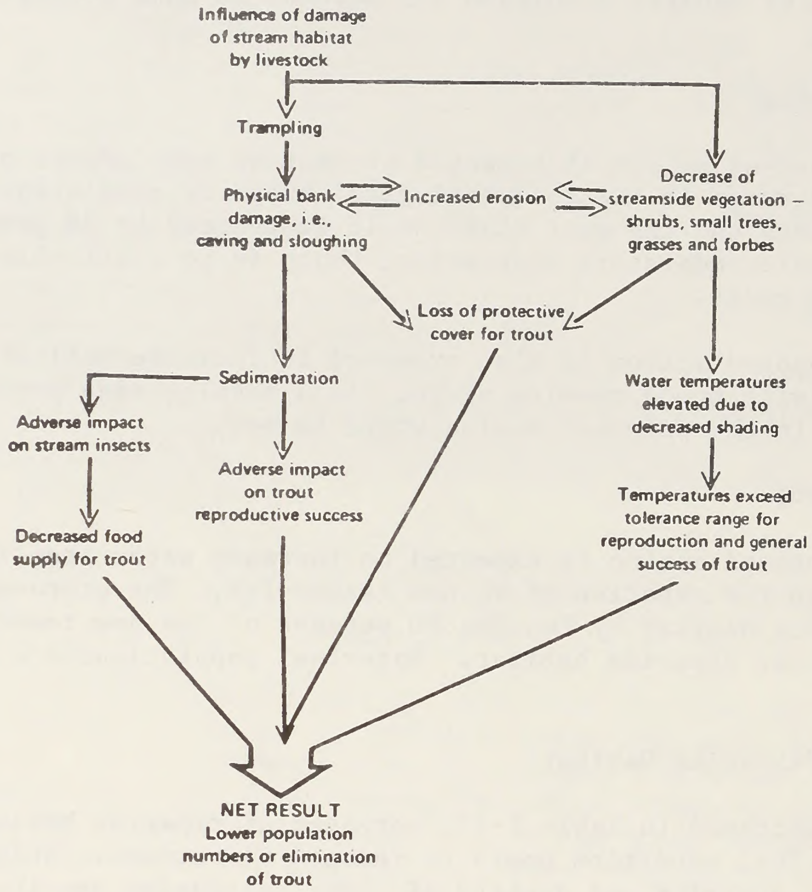
AQUATIC WILDLIFE

Fisheries Habitat Condition

Most of the EIS streams are small desert streams where riparian vegetation is a key factor associated with good fisheries habitat condition; therefore impact analysis of fisheries habitat condition will closely follow the impact analysis of riparian vegetation as discussed in the vegetation section of this chapter.

Overall impacts of livestock grazing on the aquatic ecosystem have been summarized by Armour (1977) as shown in Figure 4-1 and by Platts (1978). Many of these impacts are demonstrated in the stream areas presented in Chapter 3 which have moderate to high conflicts with cattle grazing (Appendix Table K-1).

Summary of Livestock Grazing Impacts on the Aquatic Ecosystem



To assess impacts on fisheries habitat condition, each EIS stream was analyzed by mileage of stream reach having the same fisheries habitat condition and the same type of management proposed. To assess the proposed action on each stream reach, many factors were considered with the grazing system. These factors include: historical livestock utilization and movement patterns in the EIS area, the effectiveness of past management systems, upland range condition, the season-of-use proposed in relation to plant phenology, the plant species composition favored by the proposed action, plant vigor, the balance of vegetative carrying capacities of each pasture in the grazing system proposed, the present fisheries habitat condition, stream hydrology, the amount of vegetative rest in riparian pastures, topography, and livestock utilization levels. The effectiveness of the grazing system proposed for improving riparian habitat condition would depend on the above factors. Although studies have been presented in the literature concerning the effectiveness of various grazing systems on improving riparian habitat condition, these studies are not used for fisheries EIS impact analysis. This is because neither proper study design nor the above factors were considered in these studies to conclude the observed results were attributable to the grazing systems themselves.

The relative impact of proposed grazing systems and seasons-of-use on riparian vegetation and fisheries habitat condition of EIS streams based on some of the factors presented are generally as follows:

	No Change	Slight Improvement	Improve to fair	Improve to good
3RR Spr	X			
3RR Spr, Sum Fall			X	
2DR, Sum, Fall			X	
2DR, Spr, Fall		X		
3DR, Sum, Fall		X		
lDR, to after seedripe		X		
2RR, Spr	X			
4RR, season long			X	
3DR, after seedripe	X			
7DR	X			
DR, to fall/winter	X			
lDR, Spr	X			
lDR, Spr/Fall	X			
lRR, Spr, Sum	X			
lDR, Fall	X			

See Appendix Table C-8 for a description of abreviations in the above table. Each stream reach was analyzed for fisheries habitat condition impacts by riparian allotment pasture with each of the factors listed in the impact analysis.

The above impact analysis is in general agreement with the assessment presented by seven interdisciplinary specialists meeting in May 1977 in Sparks, Nevada for a symposium on livestock interactions with fish and their environments. Platts (1978) has summarized the overview of the team on the following grazing systems, seasons-of-use, and overall condition of resulting riparian-aquatic habitat:

System	Condition of resulting riparian-aquatic habitat
Yearlong grazing	Poor
Seasonlong grazing	Poor
Deferred grazing	Poor to Fair
Rotation grazing	Poor to Fair
Deferred rotation grazing	Poor to Fair
Rest rotation grazing	Poor to Variable
Short duration, high intensity grazing	Variable
No grazing	Excellent

Although the proposed reduction in utilization levels to 50 percent would aid in some habitat condition improvement, it is unlikely that this reduction alone would show significant impacts in riparian areas. This is because cattle have historically congregated in riparian areas and would continue to do so until upland range conditions improve and other effective measures to disperse the cattle away from riparian areas are implemented. Since riparian areas receive more use than other range areas and would not be key use areas for determining the 50 percent utilization levels, utilization levels in riparian areas would be higher than 50 percent.

In areas managed in association with private lands and in the less intensive management areas, utilization levels would be set through biological use limits which consider plant phenology in the utilization adjustments. These utilization levels would also be lower than the intensive management units with 50 percent utilization levels. Based on the above considerations, riparian areas associated with these two types of management (Appendix Table K-9) should improve slightly over the present habitat condition rating.

The effectiveness of the proposed riparian log structures for improving fisheries habitat condition is undocumented. However, variations on the type of structures proposed have been effective in the Bridger-Teton National Forest (Don Bartschi 1980, personal communication) and in Grant County, Oregon along the South Fork of the John Day River (Storch 1979). Because these log structure projects are so recent and the proposed log structures would be experimental in the EIS area, it may take up to five years to develop an effective design for improving the 86 stream miles associated with these structures. Habitat condition should improve slightly in the first ten years in areas with log structures and in twenty years poor condition stream areas with log structures should improve to fair condition.

Stream fencing has been well-documented as an effective means of fisheries habitat recovery in heavily grazed impact areas (Marcuson 1977; Van Velson 1977; Duff 1978; Lorz 1974; Winegar 1977; Claire 1977, Kennedy 1977; Dahlem 1979). Improvement of riparian areas from poor to good condition in less than ten years has been reported in many of these fenced stream studies. Of the 64 miles of stream proposed for fencing, 58 miles of stream area are expected to improve to good in ten years. The remaining six miles of stream may take longer than ten years to improve to good condition due to hydrological conditions but should reach good condition by twenty years. These changes in habitat condition on proposed fencing areas are shown in Appendix Table K-9 along with ten and 20-year projected habitat condition and impact factors for each EIS stream reach. Even with the 64 miles of stream fencing proposed, the management objective of attaining good fisheries habitat condition in ten years on the 113 stream miles identified on Map 2-2 (proposed action fencing areas plus alternative #3 fencing areas) would not be met. In twenty years, 113 stream miles should improve to good condition but only 65 percent of these stream miles include those identified in the above stream management objective. The remaining 35 percent of the stream miles improving to good habitat condition from log structures and/or proposed grazing systems are identified in Appendix Table K-9.

The overall fisheries habitat condition on 421 stream miles would improve as follows:

	Fisheries Habitat Condition			Impact Category			
	Poor	Fair	Good	No Change	Slight Improvement	Improve to Fair	Improve to Good
Present Situation	51%	36%	13%				
10-Year Condition	20%	53%	27%	43%	22%	21%	14%
20-Year Condition	5%	55%	40%	37%	8%	28%	27%

Water Quality and Quantity

Since fisheries habitat condition factors are also associated with water quality and quantity, impact analysis on habitat condition by stream reach is used to assess impacts on water quality and quantity of these same stream reaches and of all EIS streams.

Water quality and quantity would be most beneficially impacted in ten years on the 64 stream miles of proposed fencing. These stream reaches would be expected to exhibit 3-11° F cooler maximum summer water temperatures than the present summer high temperatures. These temperature change predictions are based upon the range reported in stream fencing studies in geographical areas similar to that of the EIS area (Van Velson 1977; Storch 1979). As habitat condition improves to good in fenced mileages, more even streamflows throughout a year, narrowing of stream channels, and deepening of pool areas should follow in these same stream areas. These impacts have been reported in fenced stream studies (Van Velson 1977; Duff 1977; Winegar 1977; Marcuson 1977). As these water quality factors improve, EIS stream areas with other chemical constituents which are at levels limiting to trout during low flow periods (such as percent O_2 saturation, pH, total dissolved solids and nutrients) should become less limiting to trout populations.

Since silt problems in EIS streams are largely associated with vegetative impacts from livestock grazing conflict areas (Appendix Tables K-1, K-2 and K-3), response in habitat condition to good in fenced areas in ten years (which also reflects good vegetative growth) should show large decreases in the amount of silt in these stream areas.

An additional 41 stream miles predicted to reach good condition in twenty years should likewise show many of the above impact responses.

Stream reaches with habitat condition impacts showing improvement from poor to fair condition and with slight improvement within a habitat condition category would not exhibit a significant change in water quality or quantity.

Impacts to fisheries from proposed land treatments and project developments should be mitigated to a large extent by measures associated with treatment and project development to protect riparian areas and water quality of streams. However, there may be short-term increases of sediment to some stream areas from the burning or chaining treatments (see soils section of Chapter 4). Although soil erosion rates have been estimated for some of the proposed treatments (see soils section of Chapter 4), the percentage of the soil actually delivered to streams from these treatments cannot be quantified at this time.

Long-term impacts to fisheries resulting from the proposed land treatments and project developments should be negligible since these treatment areas would be revegetated within two years after treatment.

Overall water quality and quantity conditions for trout in the 42 EIS streams would improve as follows:

	Water Quality & Quantity		
	Poor	Fair	Good
Present Situation	57%	43%	0%
10-Year Condition	43%	47%	10%
20-Year Condition	15%	71%	14%

Aquatic Macro-Invertebrates

Based on fisheries habitat condition responses and water quality responses to the proposed action, community richness on the 42 EIS streams should improve as follows:

	Community Richness		
	Poor	Fair	Good
Present Situation	38%	45%	17%
10-Year Condition	35%	38%	27%
20-Year Condition	9%	62%	29%

The most abundant organisms by percentage composition of species in EIS streams should show a trend toward the aquatic insect orders associated with cleaner water quality such as mayflies and stoneflies versus the present predominant group, caddisflies.

Fish food abundance in the 42 EIS streams should improve as follows:

	Fish Food Abundance		
	Poor	Fair	Good
Present Situation	26%	62%	12%
10-Year Condition	26%	55%	19%
20-Year Condition	7%	69%	24%

The above impacts on aquatic macro-invertebrates reflect increases in biotic productivity of stream areas and in the balance and stability of the aquatic community. Both would aid in creating conditions for increased fishery production in stream areas showing improvement.

Fish Populations

Impacts on fish populations are based upon analysis of fisheries habitat condition, water quality and quantity, and aquatic macroinvertebrates of EIS stream reaches. Limiting factors to fish which are unchanged by the proposed action in EIS streams are also considered.

In the 58 stream miles of fencing which would improve to good in ten years, trout populations should show an increase of 300-400 percent over present population numbers and biomass of fish in these stream reaches. These projected increases are based upon those reported in stream fencing studies (Duff 1977, Lorz 1974, and Marcuson 1977).

An additional 45 miles of the 47 stream miles which would improve to good habitat condition in twenty years, should show the same percent fish population increases as above.

EIS stream inventory information showed average increases of 100 trout per surface-acre and twelve pounds of trout per surface-acre for each point increase in fisheries habitat condition between two stream reaches of the same stream (Appendix K). Based on this inventory information, the average point difference between habitat categories or within a habitat category, and the equivalence of 1.2 surface-acres per EIS stream mile, the following trout numbers and biomass projections were used for impact assessment on each EIS stream mile:

Slight improvement in habitat condition equals increases of 240 trout and 30 pounds of trout per mile.

Improve to fair from poor habitat condition equals increases of 360 trout and 43 pounds of trout per mile.

Improve to good from fair habitat condition equals increases of 480 trout and 58 pounds of trout per mile.

Improve to good from poor habitat condition equals increases of 1,080 trout and 127 pounds of trout per mile.

By applying the analysis above, overall increases in redband trout numbers and pounds would be as follows:

	Trout Numbers	Pounds of Trout
Present Situation*	76,000	4,000
10-Year Conditions	174,000	16,000
20-Year Conditions	224,000	22,000

* From stream inventory (Appendix K, Appendix Tables K-7 and K-8).

Eight streams presently without trout populations should have a high potential to support trout in 20 years. One stream would remain with little potential to support fish populations.

Stream areas with habitat improvement should show increased percentages of redband trout and sculpins, and decreased percentages of other fish species. Growth of redband trout should increase with habitat condition improvement and expansion. The average size of adult trout should increase from five to seven inches to eight inches or more in stream areas improving to good habitat conditon.

Summary

Predicted impacts on aquatic wildlife components are summarized by ten and 20-year impacts in Table 4-11.

Table 4-11

Predicted Impacts with Implementation of the Proposed Action

	Fisheries Habitat Condition (% of 421 stream miles)			Community Richness (% of 42 EIS streams)			Water Quality and Quantity for Fisheries (% of 42 EIS streams)			Trout numbers and pounds of trout	
	Poor	Fair	Good	Poor	Fair	Good	Poor	Fair	Good	Number	Pounds
Present Situation	51%	36%	13%	38%	45%	17%	57%	43%	0%	76,000	4,000
10-Year Condition	20%	53%	27%	35%	38%	27%	43%	47%	10%	174,000	16,000
20-Year Condition	5%	55%	40%	9%	62%	29%	15%	71%	14%	224,000	22,000

The stream management objective of attaining good fisheries habitat condition on the 113 stream miles shown on Map 2-2 would not be met in ten or 20 years under the proposed action. However, the stream management objective of attaining fair fisheries habitat condition on 99 percent of the EIS stream mileages in twenty years would be met within four percent. An additional eight EIS streams would have a high potential to support trout in twenty years with implementation of the proposed action.

WILD HORSES

The proposed action allocates vegetation to a maximum of 178 wild horses within the Shares Basin, Sands Basin, Rats Nest, River Group, Reynolds Creek and Black Mountain allotments (see Table 3-5). Allocating adequate forage for wild horses (2,329 AUMs) would have beneficial impacts. Forage competition between wild horses and livestock would be reduced creating a better quality horse and an increase in colt production and survival. Competition among the horses would be controlled by periodic removal of excess horses.

The removal of 146 head (45 percent of 1980 level) would be necessary to achieve the proposed action. This would include the removal of all wild horses outside the recognized wild horse areas. These removals would seperate mares from their colts and stallions from their harems.

Livestock grazing systems on the above allotments within proposed wild horse management areas would increase the competition for forage among wild horses and livestock in pastures being grazed. This is from increased livestock confinement leading to more thorough foraging. The wild horses in the pastures not grazed by livestock in a particular year, would benefit since no competition for the forage occurs. Increased forage competition with livestock could cause some wild horses to move out of traditional areas of use; however, the magnitude of this reaction is unmeasurable.

The construction of pasture fences in Reynolds Creek, Black Mountain and Sands Basin would restrict free movement of wild horses. Fences would confine them during the livestock grazing season and may also prevent their movement into wintering areas.

The twelve water developments would be beneficial for the wild horses, since they would, in some areas, reduce travelling distance to water. Other areas presently ungrazable because of distance from water might be made available with the additional water sources; the net benefit to wild horses would be dependent upon the terrain and distance involved.

Additional forage resulting from vegetation manipulations and the 6,359 additional AUMs made available due to treatments would become available to wild horses. This forage would improve their foraging ability and their diets.

Summary

Competition between wild horses, livestock and wildlife for forage would decrease. Installation of an additional sixteen miles of pasture fences would limit the free roaming wild horses and confine them during the season that livestock graze the allotment.

Additional water development and vegetation manipulations would provide greater distribution and more forage. It would minimize the adverse effects associated with grazing management. The habitat needs for the wild horses would be met initally under the proposed action. The future habitat needs would also be met if periodic removal of excess horses continues.

CULTURAL RESOURCES

The impact of the proposed action on cultural resources in the ORA will be discussed in terms of the impacts of grazing systems and range improvement projects on specific types of cultural resource sites. As previously mentioned, more prehistoric sites are being damaged than historic sites. This ratio (approximately 60:1) is expected to remain the same should the proposed action be implemented.

Prehistoric Sites

Livestock grazing and associated trampling adversely impact prehistoric cultural resources directly by soil disturbance (Limbrey 1975:240) and artifact modification (breakage, change in location, etc.,) and indirectly by contributing to the effects of erosion. Village sites, temporary hunting and gathering camps, tool manufacturing sites and isolated artifacts could be adversely impacted. Rock shelters, rock alignments and rock art are not normally impacted by livestock.

Soil disturbance includes the compaction of soils, which results in the vertical displacement and modification of buried artifacts and features associated with cultural resource sites; and the surface excavation, modification and horizontal displacement of surface artifacts and features.

Once disturbed, the cultural resource site may be further modified by wind and water erosion beyond what might be expected from geological causes alone (Heady 1975). The total effect may be completely destructive in terms of any future use of the site.

The degree of adverse impact to cultural resource sites is difficult to quantify. For the purpose of this analysis it would be assumed that "slight" impacts result in less than 10 percent deterioration of site integrity, "low" impacts range from 10 percent to 30 percent deterioration, "moderate" from 30 percent to 75 percent, and "severe" from 75 percent to 100 percent. Accurate estimates of the total number of cultural resource sites impacted can not be made from the data presently available.

Implementation of the proposed grazing systems would in some cases, increase the distribution of livestock within a pasture, thereby increasing the liklihood that cultural resource sites would be adversely impacted by trampling and erosion. The number of sites damaged would show a slight increase over present levels.

Range improvement projects such as spring and reservoir development would also cause a slight increase in the number of sites adversely impacted by livestock trampling and erosion. These impacts would result from concentrations of livestock near project developments but outside the area covered by the cultural resource inventory which precedes project development.

Grazing systems and land treatment projects would have beneficial impacts on the condition of cultural resource sites since the rejuvenation of vegetation cover would decrease the effects of erosion.

Historic Sites

Beneficial and adverse impacts of the proposed action on historic cultural resource sites would be similar to those described for prehistoric sites. Homesteads are damaged through the effects of livestock rubbing against the structures, or used as shelter. Temporary sheep and cattle camps, and military sites could be adversely impacted by livestock trampling and erosion. Trailing settlements and historic roads and trails are not normally impacted by livestock.

National Register Sites

No cultural resource sites presently accepted to the National Register of Historic Places would be adversely impacted by the proposed action, but it is probable that presently undiscovered cultural resource sites of National Register quality would be adversely impacted.

Summary

Adverse impacts to prehistoric and historic cultural resource sites would increase slightly over the present situation from the proposed action. These impacts would occur from increased concentrations of livestock near spring and reservoir developments and on areas currently ungrazed or lightly grazed. Beneficial impacts in the form of increased vegetative cover would decrease the effects of erosion on cultural resources.

WILDERNESS

The proposed action includes some combination of range improvements and/or vegetation manipulations for each area still under wilderness review. The relative impact of the proposed action on wilderness resource, assuming full implementation is as follows:

Unit No.	Unit Name	Proposed Action: Reservoir	Proposed Action: Spring Development	Proposed Action: Miles of Pasture Fence	Stream Protection Miles: Fence	Stream Protection Miles: Log Structure	Acres Prescribed Burning	Potential Impact of Proposed Action*
16-2	Jump Creek	7	0	3	0	0	1,600	High
16-9	Reynolds Creek Canyon	0	0	0	0	3	4,700	Moderate
16-40	North Fork Owyhee River	8	4	6	14	2	6,000	High
16-41	Horsehead Spring	0	0	0	0	0	1,000	Low
16-42	Squaw Creek Canyon	0	1	3	0	0	4,000	Moderate
16-44	Deep Creek	0	1	0	0	0	0	Low
16-45	Middle Fork Owyhee River	0	1	0	2.5	0	3,000	Low
16-47	West Fork Red Canyon	0	2	0	14	0	3,500	Moderate
16-49A	Deep Creek-Owyhee River	0	6	7	0	0	800	High
16-48B	Lower Owyhee River	3	0	0	0	0	0	Moderate
	Birds of Prey Area	0	0	4	0	0	0	Low

*High: Conflict with wilderness resources in all or part of unit. Elements of proposed action will require modification to protect potential wilderness.
Moderate: Potential conflicts. Proposed action may or may not require modification.
Low: Little or no conflict with wilderness resources. Elements of proposed action likely will not require modification.

However, lands under wilderness review would be managed under the Interim Management Policy (page 2-14, Standard Operating Procedures) so their suitability for preservation as wilderness would not be impaired. Specific impacts of each proposed activity will be assessed in site-specific analysis.

The residual effects of the proposed action on wilderness values, as opposed to wilderness suitability, would introduce some new man-made features in the form of nonimpairing range improvements; improve wilderness resources of natural vegetation and soil condition, and fish and wildlife habitat, through changes in grazing systems and numbers; and create some temporary impacts on natural processes and visual resources in prescribed burn areas, with a potential for long-term beneficial effects on wilderness resources such as wildlife and ecological diversity.

VISUAL RESOURCES

The proximity of the viewer to the development influences the impact level or contrast. The further a subject is from the viewer, the less the impact/contrast. All proposed improvements were evaluated from a foreground view (one half to one mile). Many projects are very noticeable in their first year, but quickly fade. Therefore, all project impacts are measured in the third year of the project.

Each type of proposed range improvement has been evaluated to determine the visual impact with respective VRM classes. This is summarized in Table 4-12. The maximum impact level for each class was described in Chapter 3.

Impacts on Class I and II

Scenery quality in a Class II area could equal that in a Class I area. Generally, this is the case in the EIS area. Therefore, the adverse visual impacts created by proposed range improvement project would be similar in both classes.

Because small-scale burning, spring development and troughs are the only activities proposed in these areas, there would be no significant impacts.

Impacts on Class III and IV

Most Class III areas occur along the major transportation corridors in the EIS area. Scenic quality in these areas is normally lower than in Class I and II areas and would be less affected by proposed range improvements. Class IV areas are similar in scenic quality to Class III areas but they lie in seldom-seen areas, rather than in theforeground zone.

Standard operating procedures should mitigate nearly all adverse visual impacts of the proposed action. The only exception would be pipelines. Use of the one stop "ripper tooth" method would have minimal impact on visual resources. Where the ripper tooth cannot be used, greater site disturbance occurs. Construction activities would alter the land, soil color and vegetation. The pipeline scars would persit for decades. Because of the need to locate pipelines to obtain gravity flow from the source to the water storage tank or trough, there is

Table 4-12
Visual Impact Analysis

Project	Major Contrasting Element	Feature With Highest Contrast	Impact Level* Class I	Class II	Class III	Class IV
1. Multiple Pasture Grazing System	Line, Color	Vegetation	Moderate	Moderate	Low	Low
2. Spring Development	Form, Color	Structure	Moderate	Moderate	Low	Low
3. Reservoir	Line Form	Land/Water Body	High**	High**	Moderate	Moderate
4. Pipeline	Line	Vegetation	High**	High**	High**	Moderate
5. Water Trough	Color	Structure	Moderate	Moderate	Low	Low
6. Fence	Line	Structure	Moderate**	Moderate**	Low	Low
7. Control Burn	Line, Color	Vegetation	Moderate	Moderate	Low	Low
8. Spraying	Line, Color, Texture	Vegetation	High**	High**	Moderate	Moderate
9. Chaining	Line, Color	Vegetation	High**	High**	Low	Low
10. Vegetation manipulation & reseeding	Line, Color, Texture	Vegetation	High**	High**	Moderate	Moderate

SOURCE: BLM Manual 8400.

* These impacts are evaluated during the third year in the foreground only (1/2-1 mile). Generally, the further a subject is from the viewer, the less the impact/contrast.
** No projects proposed.

Low - the contrast can be seen, but it does not attract attention.

Moderate - the contrast begins to attract attention and to dominate the landscape.

High - the contrast demands attention; will not be overlooked, is a dominant feature, and is not harmonious with the basic elements of the natural landscape.

little opportunity to design pipelines consistent with natural lines. Therefore, wherever the ripper tooth cannot be used, unacceptable constrast would result.

Summary

In areas designated as Visual Reosurce Management Classes I and II, impacts to visual resources would be moderate; however, the range improvements proposed in these areas are minimal. Development of range improvements and establishment of grazing systems would have a slight adverse effect on visual resources. Because the majority of range improvement projects lie within areas identified as Visual Resource Management Classes III and IV, range improvements would have a minor impact or low contrast with the existing landscape character.

RECREATION

Effects of the proposed action on recreation use are difficult to quantify since recreation use would increase with or without its implementation because of regional population growth. Recreation visitation is flexible in nature; transfers of use from one area to another being common due to corresponding increases or decreases of available recreation opportunities and quality. Future recreation use may also be influenced by future fuel cost and availability.

Off-Road Vehicle Use

The proposed action calls for construction of 6.5 miles of fence in popular ORV areas and twelve miles of fence in more suitable snowmobile areas. Fences would be barriers to cross-country ORV travel, and when nearly buried by snow, a hazard to snowmobilers. Throughout the EIS area, gates installed where fences cross roads would be an annoyance to motor vehicle users.

In the northern part of the EIS area, seasonal closures of portions of popular ORV areas to motorized use off designated roads would affect this activity from April 1 to June 15. Since portions of popular ORV areas would be open during the spring of each year, a seasonal closure of one area would result in ORV use being periodically transferred to adjacent open areas, possibly resulting in overuse and damage to vegetation and soil.

Proposed removal of brush by burning or chaining in areas to be designated as open to ORV and snowmobile use would enhance opportunities for cross-country travel. Development of two-track access trails for construction and maintenance of livestock improvements would enhance opportunities for motorized recreation vehicle use.

Hunting

The proposed action would cause an increase in the distribution of games species. Due to improved habitat, populations of big game, upland game, and waterfowl would increase over present levels. Implementation of the proposed action should result in a hunting increase of fourteen percent over projected increases by the year 2000. Hunter success ratios would also improve.

As with other activities, proposed fences would restrict hunting access, while service roads to proposed livestock improvements would provide access and aid in the dispersion of hunting use.

Fishing

There would be a long-term improvement in fishing opportunities if the proposed action is implemented. By implementation of the proposed action trout numbers would increase from 76,000 to 94,000 by the year 2000. Increased trout numbers along with an increase in size should encourage additional fishing use within the area. With the proposed action, fishing use may increase to 1,500 activity occasions by the year 2000; 400 activity occasions over projected use levels.

Summary

Proposed fences would restrict cross-country travel for several forms of recreation. Improved vegetative conditons would create a long-term beneficial impact on wildlife and fishery resources, improving the quality of hunting and fishing opportunities.

It is unlikely that implementation of the proposed action would create any regional or statewide increase in recreation use. However, improvement in the quality of recreation opportunities, especially hunting and fishing, could cause increased recreation use within the EIS area as recreation use patterns shift, and use is transferred to the EIS area from other areas in southern Idaho.

The following table summarizes estimated future recreation use (activity occasions) with and without implementation of the proposed action.

Table 4-13
Recreation Use 1/

	Existing Situation	With Proposed Action Year 2000	No Action Year 2000 2/
Off-Road Vehicle	175,000	300,000	300,000
Hunting	97,585	160,000	140,000
Fishing	724	1,500	1,100
TOTAL	273,309	461,500	441,100

1/ activity occasions
2/ These figures represent continuation of current trend.

LIVESTOCK GRAZING

The proposed intensive grazing management (on 70 allotments), and changes in season-of-use (on 85 allotments) should increase vigor and production of preferred species. The expected improvement in livestock forage should be reflected by improved livestock conditions. The proposed action calls for an initial reduction in AUMs (92,076 to 52,167) on 82 allotments to balance total vegetative consumption with the existing resource. Impacts to livestock operators concerning adjustment in AUMs are displayed and discussed in the social and economics sections of this chapter. Initial increases from 21,046 AUMs to 25,427 AUMs would occur on 29 allotments, with an additional 742 AUMs on 32 allotments which do not have active preference (Appendix Table C-8).

The long-term impacts obtained from the season-of-use adjustments and grazing management systems would create an increase of forage available for allocation (see vegetation section). This would produce an increase of approximately 22,098 AUMs throughout the EIS area. Vegetative manipulation projects would provide an additonal 41,184 AUMs within the EIS area. See Appendix Table C-9 for figures on estimated future AUMs for each individual allotment.

The 64 miles of proposed fencing for riparian zones would require their maintenance, which would exclude livestock from these areas. If maintenance is not conducted, livestock would become entrapped in the habitat exclosure. This would cause severe overgrazing and deterioration of the riparian zone and fisheries habitat being protected.

The proposed action would require closer supervision of herds by ranchers and increased work loads for moving livestock when full allowable use of pastures has been reached. Operators may be required to remove livestock from certain pastures for as long as two years while seedings become established, resulting in a demand for other pastureage for the animals during the interim. Sufficient additional pasturage may not be available to operators to make this adjustment. This would create a short-term reduction of herd size, and a reduction of income.

Summary

The initial stocking level of 78,336 AUMs is 34,786 AUMs below active preference. However, after twenty years under the proposed action, forage production would increase 63,781 AUMs from grazing management and vegetative manipulations. Increased forage would be allocated to livestock, which would meet our objectives of 142,276 AUMs. Table 4-14 summarizes AUMs for the major ungulants on the EIS area. Allotment specific AUM allocation is presented in Appendix Table C-9. In spite of some individual and short-term adverse impacts, the overall net impact of the proposed action on livestock would be beneficial.

Table 4-14
Summary of AUM Allocation for Proposed Action

Initial	82,817	2,152	2,329	78,336	-31*
20-Year Projection	146,757	2,152	2,329	142,276	+26*

* The percent change from active preference.

ECONOMICS

Rancher Income

The proposed action would cause a 31 percent reduction in AUMs from current active preference. It would be a 26 percent reduction from the five-year (1974-78) average actual use. Table 4-15 shows the proposed AUMs by size group and the AUM changes from active preference and average use.

There are several courses of action ranchers might take to adjust to these AUM reductions. They could: (1) purchase (or hold back from sale) hay (2) reduce their herd size (3) rent, lease, or purchase additional private pasture. Discussions with area ranchers have indicated that the reduced herd size option is not feasible for the following reasons: (1) need to keep herd numbers up to maintian cash flow; (2) desire to utilize non-BLM forage during other seasons which require the higher herd sizes. It was also indicated that private pasture for rent, lease, or sale is not available in the EIS area. For these reasons, changes in rancher income are based on the substitutions of hay for Bureau of Land Management AUMs and vice versa. Changes in AUM levels are measured against the five-year average actual use levels since that is the number of AUMs the ranchers are currently utilizing.

Linear programming models were used to determine the income change to each size group from the percentage AUM change anticipated in that group. Linear programming is a technique which optimizes a particular function; in this case, the allocation of resources to various activities. A more complete description of this process can be found in Appendix L.

To replace lost AUMs with purchased hay (or hay held back from sale) would cost permittees $367,000 annually in net income. This represents one percent of the regional farm income. If all the losses occurred in Owyhee County (which they do not), they would represent 22 percent of that county's farm income. These annual losses would continue until AUMs which are gained from range improvements and management systems are reallocated to the permittee. By the tenth year after implementation, 21 percent of the lost AUMs would be gained back, reducing the annual net income loss to $290,000. By the fifteenth year, 65 percent of the AUMs would be regained, further reducing the annual net income loss to $128,000. In the long-term, 20 years or more after implementation,

Table 4-15
Owyhee EIS Area
Size Group Data
Proposed Action

Group	Herd Size	Number of Cattle	Number of Sheep	Active AUMs	Average AUMs	Proposed AUMs 1/	Loss from Active		Loss from Average	
							Number	Percent	Number	Percent
1	0-149	1,340	0	7,599	7,592	5,647	1,952	26	1,945	26
2	150-399	7,429	0	22,284	22,584	16,655	5,629	25	5,929	26
3	400+	26,801	12,200	83,239	74,833	55,292	27,569	33	19,536	26
TOTAL	---	35,570	12,200	113,122	105,009	77,594	35,150	31	27,410	26

1/ Excludes those areas not previously licensed (i.e. fenced federal ranges, pasture 3 of allotment 515, allotments 610, 618, 620 and 621).

there would be approximately 35 percent more AUMs available to permittees than their current average actual use. Thus in the long-term, through substituting Bureau of Land Management AUMs for hay, there would be a total net income gain to area ranchers of $520,000 annually.

Table 4-16 shows the average change per operator by size group for the short and long terms. The table shows that in the short-term, the proposed action would cost permittees between $1,723 and $6,557 annually and would reduce net family income from eleven to thirteen percent. In addition, there are 24 permittees who would have their AUMs reduced by 50 percent or more, twelve permittees who are reduced ten percent or less, and eighteen percent who receive increases in AUMs in the short-term.

Since the various alternatives represent differing mixes of livestock use and construction activities, the changes have been discounted to reflect what their present worth would be with an assumed interest rate of 7.125 percent. This is the rate established by the Water Resources Council for use by federal agencies in 1980. This process accounts for inflation and the time value of money and allows direct comparison between alternatives. A more complete description of the discounting process may be found in Appendix L. The net present worth of the change in rancher net income would be -$3.3 million.

The total rancher income losses could be higher than those stated due to changes in season-of-use (reduced spring grazing) but it is not quantifiable.

Regional Income

In the three-county (Canyon and Owyhee in Idaho, Malheur in Oregon) EIS study area approximately $566,000 in net income would be gained over the 20 year construction schedule. In addition, there would be a total of $136,000 gained from 20 years of maintenance of those projects. The remainder of the range improvement costs would be incurred outside the region. See Appendix L for a complete description of how the study area's share for the total costs was determined. This direct impact to the regional construction industry would have no secondary impacts on the remainder of the regional economy.

The net present worth of range improvement construction and maintenance to the regional economy would be +$433,000.

The direct income loss to the ranching community would cause secondary losses, to the livestock industry and other industries in the regional economy. These secondary income losses (as well as employment changes described later) have been calculated with the aid of the Dynamic Regional Analysis Model (DYRAM). DYRAM is a computer model developed by the Bureau of Land Management in 1976. See Appendix L for a description of DYRAM.

During the first ten years of the proposed action there would be secondary income losses of $144,000 annually from the direct changes in the livestock industry. This would be less than one-tenth of one

Table 4-16
Net Income Changes by Group
Proposed Action

Size Group	Base Income (see Chap 3)	Average Short-Term Change* (dollars)	Average Short-Term Revised Income	Average Short-Term Percent Change	Average Long-Term Change* (dollars)	Average Long-Term Revised Income	Average Long-Term Percent Change	Short-Term Variations (AUM Change) Number w/50% or greater Reduction	Short-Term Variations (AUM Change) Number w/50% or less Reduction	Short-Term Variations (AUM Change) Number with Increases
1	$16,394	- $ 1,723	$14,671	-11%	+ $ 3,842	$20,236	+23%	7	3	6
2	$25,605	- $ 3,455	$22,150	-13%	+ $ 4,559	$30,164	+18%	7	5	6
3	$49,193	- $ 6,557	$42,636	-13%	+ $ 8,862	$58,055	+18%	10	4	6

*These impacts to rancher income have been calculated through the use of ranch budgeting and linear programming techniques which are explained in Appendix L.

SOURCE: Bureau of Land Management, Idaho State Office, January 1980.

percent of the regional non-farm income. The major industries impacted would be livestock (-$20,000), other agriculture (-$23,000), food and related products (-$20,000), other manufacturing (-$20,000) transportation and communications (-$20,000), wholesale and retail trade (-$20,000), and services (-$12,000). In years eleven through fifteen, the secondary income loss would be $114,000 annually while in years sixteen through twenty, the secondary loss would be $50,000 annually. The same industries would be impacted during these time spans as during the first ten years.

The net present worth of these livestock related secondary income losses would be -$1.3 million.

The proposed action would increase the number of hunting and fishing days above that affected if no action is taken (see recreation section). At the end of 20 years there would be 400 additional fisherman-days and 20,000 additional hunter-days. Based on income per hunter and fisherman-days data (U.S.D.A. 1979), the net income in the services and retail trade sectors of the economy would increase to $212,000 annually by the twentieth year. Secondary income gains throughout the entire economy from recreation gains would be up to $26,000 by the twentieth year.

The net present worth of these recreational-related income gains would be $1.0 million.

The net present worth to the regional economy from implementing the proposed action (over 20 years) would be -$3.2 million and is comprised of the following:

Direct Rancher Losses	-$3.3 million
Secondary Losses	-$1.3 million
Gains from Range Improvements	+$0.4 million
Gains from Recreation Use	+$1.0 million

Employment

There would be a direct loss of 34 jobs in the livestock industry. These could take the form of part-time jobs, full-time ranch hands, or even ranchers going out of business. By the tenth year there would be ten direct jobs gained in services and retail trade from increased recreational use. There would be twelve secondary losses through year ten, the major losers being the livestock industry (-2 jobs), food and related (-2 jobs) and other manufacturing (-2 jobs), and wholesale and retail trade (-2 jobs). By the end of the fifteenth year, the total employment losses would be 22 jobs (in other words a total of 25 jobs would have been gained back). By the twentieth year, the employment losses would be eliminated and six jobs would be gained (recreation-related).

Ranch Consolidation

The Bureau of Land Management AUM level used in the linear programming (L.P.) analysis was determined from the ranch budgeting process (see Chapter 3). For each size group, the AUMs from the three budgets collected were averaged as input into the model. It has been assumed, for purposes of this analysis, that a permittee would have difficulty remaining in business if he loses 50 percent or more of his AUMs, and this amount is larger than the level modelled in the L.P. analysis. The number of permittees who fall into this category are:

Group	Number of Permittees
1	5
2	7
3	9
TOTAL	21

Basically four things could happen: (1) sale of ranches; (2) consolidation with other ranches; (3) reduction or alteration of operation (reduce herd, row cropping, etc.); or (4) bankruptcy. It is not expected that many outright sales of ranches would occur. This is because anyone purchasing them would have the same operating difficulties as the present owner and the EIS area does not exhibit qualities necessary to make the ranches attractive for subdivision development.

Capital Position

Since reductions in permits or permit values are measured against the total qualified demand, the impact of the loss of capital assets in the form of federal AUMs could be larger than the direct loss of income due to reductions measured against the five-year average use. Neilson and Workman (1971) speak to the point:

> "Grazing permits held today represent an asset which a rancher can borrow against or sell in the market. If this asset becomes non-saleable, the rancher has lost the opportunity of marketing a valuable asset..."
>
> "If the permit is reduced, the value of the permit is also reduced and the rancher has lost a capital asset which previously could have been sold, or at the least, been used as collateral for securing loans."

In addition, any impacts in this area would only occur where a rancher sells his ranch, his grazing permit, or uses the federal AUMs for collateral when obtaining a loan.

The BLM does not officially recognize that grazing permits have attained a capitalized value and are bought and sold on the marketplace.

Other Impacts

The proposed action would cost the federal government $4.5 million over 20 years for installation and maintenance of range improvements. This would have a net present worth of $2.8 million.

Over the first ten years of the proposal, the federal government would collect $55,000 (27,500 AUMs x $2/AUM) less in grazing fees annually. From years eleven to fifteen, the collections would be

$44,000 less and from years sixteen to twenty, it would be $20,000 less.These reductions in grazing fee collections would have a net present worth of $504,000. Half of the grazing fees collected are returned to the BLM for range betterment, the state recovers 12.5 percent for redistribution to advisory boards and counties, and 37.5 percent is deposited in the U.S. Treasury.

Summary

The annual regional net income changes due to the changes in the livestock industry would have a net present value of -$4.6 million. Changes in the regional economy from range improvement construction and maintenance would have a net present worth of +$400,000. Regional income changes from increased recreational use would have a net present worth of +$1.0 million. Total employment losses would be 33 jobs in years one through ten, ten jobs by year fifteen, and by year twenty, employment losses would be eliminated and 26 jobs gained. At least 21 permittees would have difficulty remaining in business.

The net present worth to the federal government of range improvements and maintenance would be -$2.8 million. The present worth to state and federal government from reducing grazing fee receipts would be -$500,000.

The total net present worth of the proposed action (regional, state, federal) would be -$6.5 million.

SOCIAL CONDITIONS

Social Values and Attitudes

The proposed action would have several impacts on the social values and attitudes of the ranchers and other residents of the area. A major impact, though difficult to precisely predict, could be the sale of some ranches. It has been estimated that 21 of 83 permittees or 25 percent may have trouble remaining in business. Depending on individual circumstances, it is possible that some or all of these operations may have to sell. This could potentially end the ranching way of life for families that have been ranching for two or three generations.

If the ranches were sold or consolidated into corporations, several impacts might occur. First, corporate ranching operations frequently do not mesh with the attitudes and values of the noncorporate ranchers of the area. With fewer ranchers in the area, local social, religious and agricultural organizations would experience a loss of membership. This could threaten the effectiveness and even continued existence of some organizations. Most ranchers interviewed used local auctions and agri-businesses to some extent. With a rise in larger operations these local markets may be overlooked in favor of larger markets further away from the study area.

Another impact of grazing reduction is the necessity for each rancher to economize. This could be accomplished by reducing herd size and hired help. This would cause the loss of jobs and possibly lifestyle for their employees.

Even if ranchers do not sell their ranches, they would likely have feelings of helplessness and dissatisfaction because they have been unable to change grazing management decisions.

Of the 83 permittees, eighteen (twenty percent) would experience an increase in AUMs over their five-year average use, which would provide greater capacity for their operations. In these cases the rancher would have more confidence and positive feelings toward government activities and decisions.

Generally, those ranchers faced with reductions in grazing allocations feel the proposed action would decrease the value of their ranches and disrupt their current operations. This has prompted several of the ranchers to form the Owyhee Cattlemen's Action Group to protect their interests and future operations.

Summary

The proposal could cause 21 ranchers to consider consolidation or sale of their ranches. It could produce a loss of members to local organizations, customers to local businesses and severance of long-term family ties in the area. In some cases, it may cause the loss of the ranching lifestyle to those unable to relocate in a ranching environment. There would be eighteen ranchers receiving an increase in AUMs. These ranchers would have more confidence and positive feelings toward government activities and decisions.

ENVIRONMENTAL IMPACTS OF ALTERNATIVE 1
No Livestock Grazing

Summary

Under this alternative all livestock grazing would be eliminated. Forage on public lands would be reserved for wildlife and wild horses. Wild horses would be allowed to increase to 338 head. All fences except boundary fences around the EIS area and wild horse area would be removed. No project development or vegetative treatment projects for livestock management would be allowed.

VEGETATION

Introduction

Within the EIS area, existing condition (56.8 percent of area in poor condition) and existing trends (55.2 percent of area exhibiting downward trend) indicate a long time would pass before improvement to good range condition could be expected. Stoddart et. al. (1975); Young et. al. (1976); and Sampson and Malmsten (1926) suggest it could be even longer if livestock were eliminated from grazing. Predicting the time required to obtain substantial improvement in condition is a difficult task because of the high variability of time required for Owyhee EIS area sites to recover perennial plant cover.

Condition and Trend

Before improvements to range condition (from increased plant densities, more desirable plant composition, and improved soil stability) can be realized, individual plant vigor must be improved (Parker 1954). The determination of individual plant vigor response becomes a primary step in predicting condition improvements.

Stoddart *et*. *al*. (1975) states "there are instances in which total protection of range from livestock has failed to result in the expected revival of the vegetation, presumably because of the lack of animal action in aiding reproduction." Other factors that must be considered when predicting ecological response from exclusion of livestock are: (1) existing levels of vegetation (i.e., sagebrush, juniper, cheatgrass) competition with perennial grasses, and (2) productivity capability of particular sites (i.e., low productivity in salt-desert shrub communities). The elimination of livestock, the lack of competitive species treatment, and the significant proportion of low productivity sites (150,000 acres) in the EIS area will preclude a fast recover of ecological condition due to increases in perennial grass composition.

Based on the allotment by allotment analysis of present conditions using the literature discussion and rationale explained in the analysis of the proposed action and Appendix G, and the following assumptions were used to predict the 20-year resultant condition in this alternative:

1. Areas currently exhibiting upward trends (76,695 acres) would improve one condition class. Plant reproductive vigor on these areas is currently at favorable levels. The condition improvement of these areas was therefore expected to occur more rapidly because there would not be a time period required for vigor improvement.

2. Areas currently exhibiting static trends (377,237 acres) would initiate upward trends. If these areas were in high-fair or better condition, one-third of that area (32,710 acres) would improve one condition class. Plants in these areas due not exhibit the vigor levels required to maintain adequate seed production; however, reproductive vigor recovery will be less than 6-8 years discussed by Mueggler (1975). Allotments in good and excellent condition were predicted to achieve quicker and greater improvement than those allotments in poor and fair condition (McLean and Tisdale, 1972). Improvement was predicted to be slower than the properly stocked grazing alternatives because of the lviestock plant interactions (Stoddart et. al., 1975).

3. Areas currently exhibiting downward trends (560,365 acres) would stabilize but would not improve a condition class. Plants in these areas currently exhibit low vigor. While the exclusion of livestock grazing will improve plant vigor on the areas, the time required for vigor recovery and seedling establishment could be as much as 6-8 years (Mueggler 1975). Sampson and Malmsten (1926) suggest seedling establishment could even be longer if livestock were eliminated from grazing.

Based on the above assumptions and the resulting analysis, condition and trend would improve from the elimination of livestock. While 20-year changes are predicted to be slow, it is recognized that dramatic improvements would probably occur after 20-25 years (see Table 4-17 for summary of condition).

Cover

After the resultant condition class acreages were determined, effective ground cover was recalculated for each allotment using procedures presented in Appendix G. The recalculations indicated that cover response was variable.

Vegetation cover increases associated with improved range condition (i.e., plant basal area and density increases) were calculated to range from one to three percent. Observation of previously fenced untreated exclosures in the EIS area indicated that the total effective ground cover improved ten to fifteen percent over a similar time period. The additional cover increases (nine to twelve percent) are attributed to increased production of annuals and the associated increased litter deposition (see soils section).

Productivity

Estimates of usuable forage after 20 years were recalculated using procedures outlined in Appendix G. Total air-dry usuable forage would increase an estimated 8,800,000 pounds (equivalent to 11,000 cattle AUMs). Present average usable forage (50 pounds per acre) would improve to 58 pounds per acre.

Meadow/Riparian Vegetation

While on the average the EIS area condition improvement is expected to be slow, the meadow/riparian vegetation areas are expected to show marked improvement, Duff (1978). Plant vigor would be returned to plants in these areas quicker because: (1) these areas have a higher productive capability, (2) growing seasons are typically longer because of water availability, and (3) these areas would be grazed by wildlife and horses to a greater extent than the uplands and, thereby, receive greater grazing stimulus (see Table 4-17 for a condition summary).

Summary

The objective as stated in the proposed action (Chapter 2), would not be obtained within the 20-year planning period.

Existing ecological condition on upland sites is expected to improve at a slow rate. The condition of meadow/riparisn areas would improve significantly. A comparison of existing and 20-year ecological conditions is presented in Table 4-17. An allotment specific summary is presented in Appendix Table F-7.

Table 4-17
Condition Class Summary
Alternative #1
for Public Lands in EIS Area 1/

Ecological Condition Class	Initial Ecological Condition Meadow/Riparian Areas	Initial Ecological Condition Total EIS Area	20-year Ecological Condition Meadow/Riparian Areas	20-year Ecological Condition Total EIS Area
Poor	14.5	56.8	2.6	56.5
Fair	78.9	35.2	41.9	30.8
Good	6.6	5.1	55.5	8.5
Excellent	---	0.3	---	2.4
Treated	---	2.6	---	1.9
Total Percent	100.0	100.0	100.0	100.0

1/ Values are in terms of percent of area acres within each condition class. Currently, there are 9,718 acres of meadow/riparian vegetation in the 1,014,296 acre EIS area.

Effective ground cover is expected to increase one to three percent from vegetation improvement and an additional nine to twelve percent from additional litter deposition primarily from annual forb and grass production (see soils section).

Elimination of livestock grazing would improve productivity of usable forage by 8,800,000 pounds. This usable forage is not scheduled for allocation, but its availability should improve the foraging diet of horses and wildlife (see wildlife and wild horse sections). Table 4-18 summarizes usable forage production.

Table 4-18
Alternative #1
Usable Forage Summary 1/

	Pounds	AUMs
Present	50,472,000	63,090
20-Year	59,272,000	74,090
TOTAL	8,800,000	11,000

1/ Usable competitive livestock forage at biological limit utilization levels.

SOILS

Removing livestock grazing from the ORA would benefit watershed conditions significantly by decreasing soil compaction and erosion. Reducing utilization and the effects of trampling, would increase ground cover, mainly litter. Increasing canopy cover has the short-term effect of decreasing raindrop splash, increasing infiltration, and decreasing runoff, thus lowering the erosion rates. The long-term effect, besides decreasing erosion, is to increase the soil productivity by improving fertility through organic return from litter, improving soil structure, and increasing the soil's water holding capacity.

By removing livestock grazing pressure, intensively disturbed areas would have a chance to revegetate. Springs, riparian areas, meadows, and reservoirs would have reduced erosion rates. Reducing trampling and increasing vegetative cover on these areas would improve the erosion rates to that of the surrounding area.

The long-term erosion rates would be approaching those of optimum (excellent) watershed condition because of the improvements in cover and the removal of trampling and soil compaction. According to research from Utah, within five years of nonuse, all adverse effects of soil compaction would be alleviated. Soil erosion rates would not be in optimum condition because much of the area would still be in poor range condition (see vegetation section). Most of the improved cover would be coming from increased litter. Litter is the dominant soil protective agent when most of the rain comes. However ten to twenty years of accumulated litter could adversely affect germination and seedling establishment, and lower the overall percent of live green vegetation. This, combined with areas high in annual vegetation, would cause poorly developed root systems. The large annual flucation in vegetation cover and the lack of a stable root system would make these areas more susceptible to the above average rainstorms. Damage from these events would be slow healing and contribute to much of the accelerated erosion rates (telephone conversation with Clifton Johnson, February 1980).

Increased canopy and litter cover ranged from five to fifteen percent. The overall net affect of the increase in cover would be an eighteen percent decrease in erosion rates tons/acre/year, with the range between fourteen and 24 percent (Appendix Table H-1). Because of the range in litter cover and the amount of annual vegetation, the erosion rates may vary from year to year. The additional litter and high percent of annual vegetation would increase the potential soil damage due to wildfire.

Summary

In twenty years, the annual erosion rate would decrease by eighteen percent (1.12 tons/acre/year to 0.97 tons/acre/year). This is seven percent higher than what would occur under optimum (excellent) watershed condition.

WATER RESOURCES

Watershed Condition

Elimination of livestock grazing would create an overall improvement of the upland watershed (Table 4-7) by increasing ground cover, thus reducing runoff and erosion.

Water Availability

Water available for use by wildlife and wild horses would be reduced slightly as existing projects are salvaged and no new developments are constructed. There would be a slight, increase in water for downstream uses.

Water Uses

Water consumption by grazing animals would be reduced approximately 94 percent in the absence of livestock, to about 7.5 acre-feet annually.

TERRESTRIAL WILDLIFE

The elimination of livestock grazing would improve wildlife habitat conditions. Livestock would no longer be a competitive factor for forage. Cover and forage, especially in riparian areas, would improve substantially, benefitting riparian associated wildlife. However, vegetative recovery on poor condition ranges would be limited due to existing poor vegetative composition. Since range treatment projects for livestock are not included in this alternative, existing areas of dense sagebrush and juniper would improve only slightly within the twenty-year time frame of the EIS. Land treatment and management facilities for wildlife, watershed and wild horses would be completed in the absence of livestock grazing.

Mule deer

Mule deer habitats would improve on most ranges in the EIS area. Deer use areas that fall within dense stands of juniper and big sagebrush would improve slightly. Deer winter and summer range conflicts with cattle would be eliminated. This would cause improved deer condition and fawn survival. However, due to the large percentage of winter and summer range not expected to reach good ecological condition (Table 4-19), the deer would not be in optimum physical condition. Their population numbers could undergo undesireable fluctuations from severe winters or prolonged drought.

Antelope

Competition between livestock and antelope would be eliminated. There would be an increase in forage and cover, permitting increased population productivity. However, this alternative would not allow desired habitat improvement, since without range treatments, dense stands of big sagebrush and juniper would remain in poor ecological condition (Table 4-19).

Antelope population levels in the EIS objectives would be attained. However, due to their less than optimum physical condition, populations could fluctuate when subjected to adverse climatic conditions.

Bighorn Sheep

Bighorn sheep habitat is expected to improve; since none of their use areas are invaded by dense stands of sagebrush and juniper, little poor condition range would remain.

Bighorn sheep population objectives would be met and the population would be in good physical condition.

Sage Grouse

There would be a slight improvement of sage grouse nesting habitat, while brood rearing areas significantly improve. Table 4-19 shows that a large amount of sage grouse nesting habitat would remain in poor ecological condition. This is due to dense stands of big sagebrush which are incapable of recovery to good condition without treatment to selectively create openings and vegetative diversity.

Waterfowl

Waterfowl food, nesting and brood cover is expected to greatly improve from elimination of grazing adjacent to reservoirs and other riparian habitats. Waterfowl production would increase substantially in the EIS area.

Meadow/Riparian Wildlife

Elimination of livestock grazing in meadow/riparian habitat would result in a rapid recovery of the vegetation. This would be highly beneficial to meadow/riparian wildlife. Food supplies would be greatly enhanced for beaver. Greater aquatic prey populations and increased cover would enhance habitat for river otter. Increased food (seeds and greens) and cover would allow increased populations of passerines and small mammals. The populations of passerine birds and small mammals would, in turn, increase the abundance and diversity of predators (hawks, owls, weasels, mink, etc.).

Meadow/riparian associated wildlife are expected to meet the EIS objectives from this alternative.

Summary

This alternative would improve wildlife habitat conditions in the EIS area. Table 4-19 illustrates the ecological conditions created from the elimination of livestock grazing. The inability to treat dense stands of juniper and sagebrush limits the amount of good ecological condition that would be attained. This retention of poor condition classes would keep mule deer and antelope in less than optimum physical conditions. This could cause a fluctuation of the populations if adverse climatic conditions are experienced.

Sage grouse nesting habitat and that which falls within stands of big sagebrush, would also remain largely in poor ecological condition. However, sage grouse brood rearing habitat should improve substantially as it predominately occurs in meadow/riparian habitats.

Bighorn sheep, waterfowl and riparian associated wildlife would increase with implementation of this alternative.

Table 4-19
Wildlife Summary/Alternative #1

	Existing Situation (Acre/%)			Impact of Alternative (Acre/%)		
	Good	Fair	Poor	Good	Fair	Poor
Mule Deer						
Summer Range	20,670/ 5%	157,092/ 38%	235,638/ 57%	41,340/ 10%	148,824/ 36%	223,236/ 54%
Winter Range	27,580/ 7%	145,780/ 37%	220,640/ 56%	47,280/ 12%	137,900/ 35%	208,820/ 53%
Antelope	21,375/ 5%	158,175/ 37%	247,950/ 58%	51,300/ 12%	141,075/ 33%	235,125/ 55%
Bighorn Sheep	5,382/ 69%	2,028/ 26%	390/ 5%	7,020/ 90%	468/ 6%	312/ 4%
Sage Grouse (nesting)	7,504/ 4%	69,412/ 37%	110,684/ 59%	16,884/ 9%	65,660/ 35%	105,056/ 56%
Meadow/ Riparian Associated Wildlife	485/ 5%	8,730/ 90%	485/ 5%	5,335/ 55%	4,074/ 40%	291/ 3%

AQUATIC WILDLIFE

Fisheries Habitat Condition

To assess impacts on fisheries habitat condition, each EIS stream was broken down into stream reaches of present habitat conditions as shown by Appendix Table K-9. The following factors were considered for each ten and 20 year stream reach response: Stream areas with moderate to high livestock conflicts to fisheries (Appendix Table K-1), stream hydrology, the extent of stream reach problems created by other activity uses (Appendix Table K-3), and responding watershed condition to this alternative.

The overall change in fisheries habitat condition on the 421 stream miles would be as follows:

	Fisheries Habitat Condition			Impact Category			
	Poor	Fair	Good	No Change	Slight Improvement	Improve to Fair	Improve to Good
Present Situation	51%	36%	13%				
10-Year Condition	6%	35%	59%	24%	14%	15%	47%
20-Year Condition	3%	24%	73%	24%	5%	10%	61%

Water Quality and Quantity

Impact analysis of water quality and quantity are based upon the above stream reach responses for fisheries habitat condition since habitat condition factors are also associated with water quality and quantity.

Since 198 stream miles would show habitat condition improvement to good condition in ten years and 255 stream miles in twenty years, water quality and quantity improvement in these stream reaches should be similar to those outlined by stream miles of fencing with the proposed action implementation. However, the impacts would be slightly more beneficial per stream reach because of the larger mileages of each stream showing improvement and the cumulative effect of this improvement on downstream areas.

In summary, component changes in stream reaches improving to good should show a 3-11°F decrease in summer high water temperatures, a high percentage of silt should move out of these areas, stream channels should narrow, pools should deepen, and streamflows should be more even throughout a year.

A slight to moderate improvement would be shown in other stream reaches improving to fair habitat condition in ten years.

Overall water quality and quantity conditions for trout in the 42 EIS streams would be as follows:

	Water Quality and Quantity		
	Poor	Fair	Good
Present Situation	57%	43%	0%
10-Year Condition	32%	50%	18%
20-year Condition	7%	72%	21%

Aquatic Macro-Invertebrates

Impact analysis on aquatic macro-invertebrates is based upon the stream reach fisheries habitat condition responses and water quality and quantity responses previously projected. The percentage composition of species in EIS streams should show a trend toward the aquatic insect orders associated with cleaner water quality such as mayflies and stoneflies.

The community richness and fish food abundance on the 42 EIS stream miles would be as follows:

	Community Richness			Fish Food Abundance		
	Poor	Fair	Good	Poor	Fair	Good
Present Situation	38%	45%	17%	26%	62%	12%
10-Year Condition	31%	38%	31%	24%	52%	24%
20-Year Condition	7%	57%	36%	0%	71%	29%

Fish Populations

The same techniques were applied for impact analysis on fish populations as in the proposed action.

Trout numbers and biomass response would be as follows:

	Trout Numbers	Pounds of Trout
Present Situation	76,000	4,000
10-Year Condition	254,000	25,000
20-Year Condition	275,000	28,000

Most EIS streams should show increased percentages of redband trout and sculpins and decreased percentages of other fish species. Sizes of adult redband trout should increase in most streams from five to seven inches to eight inches or more.

Eight streams presently not supporting trout populations should have a high potential to support trout in twenty years. One stream would remain with little potential to support trout.

Summary

Impacts on aquatic wildlife components are summarized by ten and twenty year periods in the previous discussion. Fisheries habitat condition would show rapid improvement. The stream management objective of attaining good habitat condition on the 113 stream miles depicted on Map 2-2 would be met on most of this mileage in ten years. The management objective of attaining fair fisheries habitat condition on 99 percent of the EIS stream mileage in twenty years would be met. Water quality and quantity for trout, community richness, fish food abundance, and trout numbers and size would increase. An additional eight streams would have a high potential to support trout in twenty years.

WILD HORSES

Removal of livestock from the Owyhee EIS area would ensure the wild horses continued use of habitat which they have historically occupied. The current numbers would be allowed to increase, based on proper living space, and meet their forage requirements within each allotment (324 to 338). The estimated requirement for proper living space is 500 acres for each band. Periodic removal of the wild horses is needed to sustain forage production, protect the range and to maintain adequate living space. Removal of interior pasture fences would eliminate restrictions on wild horse movement.

Summary

The wild horses would benefit from the increased forage available to them through the elimination of forage competition with livestock. Horses removed due to lack of living space would have a negative impact, since it would mean a loss of their wild free roaming nature.

CULTURAL RESOURCES

Under this alternative, adverse impacts to cultural resources from livestock grazing would cease. Beneficial impacts would result from the increase in vegetative cover as a resultant decrease in erosion.

WILDERNESS

This alternative would eliminate grazing and existing fences from lands under wilderness review. These lands would be managed so their suitability for preservation as wilderness would not be impaired.

Residual effects on wilderness values would be to remove some man-made features such as pasture fences, thereby enhancing the natural character of the landscape, and to improve wilderness resources of fish, wilderness-associated wildlife and scenic values through removal of livestock.

VISUAL RESOURCE MANAGEMENT

Alternative 1 would have a positive effect on the landscape. Elimination of grazing would allow regeneration of most riparian areas and grassland growth in upland areas. Slight negative impacts would result from the slow expansion of the uniform juniper and sage cover, and preseveration of their decadent stands. Increased vegetative cover would reduce color contrasts created by bare soil and enhance the natural appearance of the landscape.

RECREATION

General

Elimination of grazing could result in the restoration of the land to a more natural condition, which would be a stimuli for increased and more enjoyable recreation use.

Elimination of grazing could cause the sale of a few ranches and some parcels of private land for recreation-related purposes, such as sportsman clubs, dude ranches and resorts, and vacation home sites. Such developments on private land would increase recreation use of adjacent public land. A sportsman club was recently established within the EIS area near Oreana on former ranch lands.

Maintenance of existing roads used for livestock purpose could be discontinued. This would have a negative impact on public recreation access. With no livestock grazing, there would be an additional threat to public safety and recreation values from wildfires carried by increased dry or dead vegetation in previously grazed areas. This could cause seasonal closures of areas of extreme fire hazard to public recreation use. Heavy vegetative growth along streams could restrict foot traffic in these areas.

If private lands receive more intense livestock use from implementation of this alternative, landowners may close their lands and private roads to public use. This would restrict public access to adjacent public lands. If boundaries of private, state, and BLM land were fenced to control livestock, the extensive fencing required would better identify public land, but would restrict cross-country public access.

Off-Road Vehicle Use

Fences which act as barriers and hazards to off-road vehicle enthusiasts would be removed, and there would be no conflicts between ORV and livestock uses on public lands.

Hunting and Fishing

Huntable populations of mule deer would almost triple over existing levels, and there would be significant increases in upland game and waterfowl populations. These increases should encourage additional hunting use. By the year 2000, a seven percent increase in hunting use over projected levels can be expected.

Trout would increase from 76,000 to almost 100,000 by the year 2000. This should create an increase in fishing use of 82 percent over projected levels or a total annual use of 2,000 activity occasions by the year 2000.

Summary

Overall recreation opportunities would improve over the present situation. Some ranches and private lands could be sold and developed into recreation-related facilities, such as sportsman clubs, dude ranches and resorts, and vacation homesites. Most private lands would probably be closed to public use and access. Projected recreation use for some recreation activities would increase. The following table summarizes estimated future recreation use (activity occasions) with and without implementation of alternative #1.

Table 4-20
Recreation Use1/

	Existing Situation	Alt. #1 Year 2000	No Action Year 2000 2/
Off-Road Vehicle	175,000	300,000	300,000
Hunting	97,585	150,000	140,000
Fishing	724	2,000	1,100
TOTAL	273,309	452,000	441,100

1/ Activity occasions

2/ These figures represent a continuation of present trends

LIVESTOCK GRAZING

Discontinuing all livestock grazing on public lands would require livestock operators to buy, lease or develop forage to compensate for the loss of 113,122 AUMs. Since there is a wide variation in the percentages that public land (BLM) grazing represents in individual livestock operations, there would be a wide variation in impacts. Some individuals could not or would not adjust to the change and would choose to sell or lease their ranches. Other operators would probably cut back the size of their breeding herd until a modified yearlong operation could be develeoped on private land or other public lands. Specific impacts to the different operations are discussed in the social and economics sections of this alternative.

Summary

Most operators with grazing preference in the Owyhee EIS area would be adversely impacted under this alternative. There is a wide variation in the percentage that public land grazing represents in individual livestock grazing operations. Much of the intermingled private land would be unuseable as it would be too expensive to fence. There would be a corresponding wide variation in the degree of impacts. Table 4-21 summarizes initial and twenty-year projections of allocatable AUMs for this alternative.

Table 4-21
Summary of AUM Allocation for Alternative #1

	Total Available	Wild-life	Horses	Livestock Allocation	Percent Change*
Initial	6,682	2,152	4,530	0	-100
20-Year Projection	6,682	2,152	4,530	0	-100

* The percent change from active preference.

ECONOMICS

Rancher Income

Implementation of this alternative would have devastating effects on the livestock industry in the Owyhee EIS area since all operators would receive 100 percent reductions in AUM use. Ranchers could adjust to this reduction as identified in the proposed action. The remainder of this analysis is based on the substitution of hay for BLM AUMs.

To replace lost AUMs with purchased hay (or hay held back from sale) would cost permittees $1.5 million annually. This represents six percent of the regional farm income. On the other hand, it would be 88 percent of the Owyhee County farm income.

Table 4-22 shows the average income change per operator by size group. Also shown are the variations (both minimum and maximum changes) within each group. The table shows this alternative would cost permittees, on the average, between $9,292 and $25,335 annually and would reduce their net family income from 52 to 57 percent. Impacts to individual permittees would vary widely around these averages with losses ranging from $0 to $106,775.

The net present worth (over 20 years) of the change in rancher net income would be -$15.7 million.

Table 4-22
Owyhee EIS
Income Change by Group
Alternative 1

Size Group	Base Income (see Chap. 3)	AVERAGE Change* (dollars)	AVERAGE Revised Income	AVERAGE Percent Change	MINIMUM Change* (dollars)	MINIMUM Revised Income	MINIMUM Percent Change	MAXIMUM Change* (dollars)	MAXIMUM Revised Income	MAXIMUM Percent Change
1	$16,394	- $ 9,292	$ 7,102	-57%	- $ 120	$16,274	- 1%	- $19,682	-$ 3,288	-120%
2	$25,605	- $13,357	$12,248	-52%	$ 0	$25,605	---	- $30,634	-$ 5,029	-120%
3	$49,193	- $25,335	$20,149	-52%	- $ 1,256	$47,937	- 3%	-$106,775	-$57,582	-217%

* These impacts to rancher income have been calculated through the use of ranch budgeting and linear programming techniques which are explained on Appendix L.

SOURCE: Bureau of Land Management, Idaho State Office, January 1980.

Regional Income

Removal of pasture fences would produce a regional income gain of $32,000 annually over five years. At the same time there would be an income loss of approximately $9,600 annually from to reduced fence maintenance contracts. The net annual income gains over the first five years would then be $22,400 ($32,000 versus $9,600). From year six on, the annual income loss would be $9,600.

The secondary income changes related to the fence removal would be a gain of an additional $470 annually over the first five years and an additional loss of $200 after year six.

The total primary and secondary income changes would be a gain of $22,870 over the first five years and a loss of $9,800 after year six.

The net present worth of these income changes would be -$9,400.

The annual income loss of $1.5 million to the ranchers would cause a secondary loss of $558,880 in the other industries (including livestock) of the regional economy. The major sectors impacted are livestock (-$78,000), other agriculture (-$82,000), food and related products (-$78,000), transportation and communication (-$79,000), wholesale and retail trade (-$78,000), and services (-$45,000). The total annual regional income from the loss to ranchers would be $2.1 million. This would represent 0.4 percent of the three-county regional income. This annual income change would have a net present worth of -$21.3 million.

This alternative would increase the number of hunting and fishing days above that expected if no action is taken (see Recreation section). At the end of 20 years there would be 900 additional fishermen days and 10,000 additional hunter days. Based on income per hunter and fisherman day data (U.S.D.A. 1979) net income in the services and retail trade sectors of the economy would increase to $110,000 annually by the twentieth year. Secondary income gains throughout the entire economy as a result from the recreation gains would be up to $15,000 by the twentieth year.

The net present worth of these recreation-related income gains would be $535,000.

The total net present worth of the alternative to the regional income would be -$20.8 million and is made up of the following basic components:

Fence Removal	-$9,400
AUM Reduction	-$21,300,000
Recreation Use	+$535,000

Employment

There would be a direct loss of 139 jobs in the livestock industry from this alternative. By the tenth year there would be five direct jobs gained in services and retail trade due to increased recreational use. There would be 52 secondary job losses through year 10; the major losses being the livestock industry (-6 jobs), other agriculture (-5 jobs), food and related (-10 jobs), other manufacturing (-10 jobs), transportation and communication (-5 jobs), wholesale and retail trade (-9 jobs), and services (-4 jobs). The livestock-related job losses would reamin constant throughout the life of the alternative. However, continuing gains in recreation-related employment would reduce the total job losses to 180 after 20 years.

Ranch Consolidation

This section is based on the assumptions used in the proposed action.

The number of permittees who would have difficulty remaining in business in their present form would be:

Group	Number of Permittees
1	6
2	15
3	22
Total	43

These operators would have the same options as identified in the proposed action.

Capital Position

This alternative would completely eliminate any capitalized value (real or perceived) which the permittees might have in their federal grazing permits.

Other Impacts

This alternative would cost the federal government approximately $640,000 over five years (present worth of $522,920) for removal of pasture fences. Once the fences are removed, the government would realize savings due to reduced maintenance costs of $38,500 annually (present worth of $305,218). The federal government would collect $210,000 (105,000 AUMs x $2/AUM) less in grazing fees annually (net present worth of $2,203,293).

Summary

The annual regional income changes from the changes in the livestock industry would have a net present worth of -$21.3 million. Changes from fence removal would have a regional net present worth of -$9,400. Regional income changes from increased recreational use would have a net present worth of +$535,000. The total net present worth of this alternative to the regional economy would be -$20.8 million. Total employment change would be a long-term loss of 174 jobs to the regional economy. At least 43 permittees would have difficulty remaining in business.

The net present worth to the federal government of fence removal would be -$217,702 (removal costs less reduced maintenance costs). The present worth to state and federal government from reduced grazing fee receipts would be -$2.2 million.

The total net present worth of this alternative (regional, state, federal) would be -$23.2 million.

SOCIAL CONDITIONS

Social Values and Attitudes

Under this alternative, 43 of 83 permittees may have difficulty remaining in business. Depending on individual circumstances,the social impacts of this alternative would be similar to those discussed under the proposed action only more severe. More hunting and fishing opportunities would be perceived by recreation users as an increase in the quality of life of the area.

ENVIRONMENTAL IMPACTS OF ALTERNATIVE 2
No Action

Summary

The current livestock grazing program would continue. The active grazing preference would remain 113,122 AUMs. This alternative assumes that average annual permitted use would remain at 105,009 AUMs. Wild horse numbers would be managed at levels described in the proposed action. Specific forage allocations to wild horses and wildlife are not made. No additional project development or land treatment projects would occur.

VEGETATION

Introduction

Heavy stocking and long seasons-of-use by livestock year after year have been major factors in the deterioration of the range (Hormay 1970). The resulting use patterns of plant species and areas have become uneven with the use occurring on the same plants, in the same areas every year. This process leads to progressively enlarging areas of deterioration, with the best plants and grazing sites being destroyed first (Hormay and Evanko 1958).

A comparison of average five-year forage allocation (84,007,200 air-dry pounds) and inventoried available usable forage (50,472,000 pounds) indicates an overobligation of forage when one considers desired optimum diets (Appendix C). While this stocking level can be expected to impact vegetation, changes in vegetation would be gradual (Stoddart et. al. 1975).

Condition and Trend

Before improvements to range condition (from increased plant densities, more desirable plant composition, and improved soil stability) can be realized, individual plant vigor must be improved (Parker 1954). The determination of individual plant vigor response becomes a primary step in predicting condition improvements.

Based on the allotment by allotment analysis of present conditions and using the literature discussion and rationale explained in the analysis of the proposed action and Appendix G, the following assumptions were used to predict the 20-year resultant condition:

1. Without a change in present management actions relating to livestock, current trends in vegetation are expected to continue.

2. Areas currently exhibiting upward trend (76,695 acres) would improve one condition class. Plant reproductive vigor one these areas is currently at favorable levels. The condition improvement of these areas was therefore expected to occur more rapidly because there would not be a time period required for vigor improvement.

3. Areas currently exhibiting static trends (377,237 acres) would show no change within the 20-year time frame.

4. Fair condition and better areas currently exhibiting downward trends (60,513 acres) would decline one condition class, because utilization levels on these areas are predicted to exceed "a reasonable expression of proper use" (Heady, 1952).

5. Poor condition areas currently exhibiting downward trend (499,851 acres) would continue to slowly decline in productivity.

Based on the above assumptions and the resulting analysis, condition is expected to improve on 76,695 acres (7.6 percent of EIS area), remain the same on 877,088 acres (86.4 percent of EIS area), and decline on 60,513 acres (6.0 percent of EIS area) (see Table 4-23 for a summary of condition change).

Cover

After the resultant condition class acreages were determined, effective ground cover was recalculated for each allotment using procedures presented in Appendix G. Observation of cover in various ecological sites showed cover declines as condition declines (Appendix Table F-2).

As (Stoddart et. al. 1975) suggests, desirable perennial plant production and cover would decline, but would probably be replaced by cover of less desirable perennial and annual plants. After the less desirable plants assume the grazing pressure and decline, cover deterioration would initiate. As a consequence, cover change is predicted to be slow.

Effective cover was calculated to decline (a three percent loss) on 73,579 acres (7.3 percent of EIS area), remain unchanged on 864, 022 acres (85,2 percent of EIS area), and improve two to ten percent on 76,695 acres (7.5 percent of EIS area).

Productivity

Overall productivity of the vegetation would gradually decline because of forage overuse (Stoddart et. al. 1975). The more consistent perennial production would slowly be replaced by the more unpredictable annual production. The hazards of basing grazing management on annuals like cheatgrass are: (1) wide variations in annual forage production, and (2) the uncertainty of the occurrance of any production great enough in volume to serve as a basis for livestock grazing (Stewart and Young 1940).

Based on the literature presented above, it was assumed that no changes would occur in the 20-year availability of usable forage, which currently is 50,472,000 air-dry pounds. Declining vegetative conditions would not necessarily reflect decreases in useable forage. A downward change in condition class could create increases of cheatgrass, sandberg bluegrass or other useable plant species. The production of these species could maintain or increase the amount of useable forage. It is recognized that the usable forage available in 20 years would be of lower quality. This would adversely affect the diets of the grazing herbivorous animals (see wildlife, wild horse, and livestock sections). Useable forage is summarized in Table 4-24.

Meadow/Riparian Vegetation

The meadow/riparian vegetation complex is currently being highly impacted (see Chapter 3, vegetation and aquatic wildlife sections). With no change in management, no change is predicted in the condition of this ecological community (see Table 4-23 for condition summary).

Summary

The objective of improving ecological condition, as stated in the proposed action description (Chapter 2) would not be attained within the 20-year period.

Existing ecological condition would decline on 60,513 acres (6.0 percent of EIS area) remain unchanged on 877,088 acres (86.14 percent of EIS area), and improve on (7.6 percent of EIS area). An allotment summary of predicted 20-year condition is presented in Appendix Table F-8). Table 4-23 summarizes current and projected condition of the meadow/riparian ecological community and the EIS area.

Table 4-23
Condition Class Summary
Alternative #2
for Public Lands in EIS Area 1/

Ecological Condition Class	Initial Ecological Condition Meadow/Riparian Areas	Initial Ecological Condition Total EIS Area	20-Year Ecological Condition Meadow/Riparian Acres	20-Year Ecological Condition Total EIS area
Poor	14.5	56.8	14.5	63.5
Fair	78.8	35.2	78.9	24.1
Good	6.6	5.1	6.6	8.9
Excellent	---	0.3	---	1.2
Treated	---	2.6	---	2.3
Total Percent	100.0	100.0	100.0	100.0

1/ Values are in terms of percent of area acres within each condition class. Currently, there are 9,718 acres of meadow/riparian vegetation in the 1,014,296 acre EIS area.

Effective ground cover was calculated to have a net improvement of two to ten percent on 76,695 acres, no change on 864,022 acres, and a net decline of three percent on 73,579 acres.

Maintaining existing management is not predicted to change usable forage production from the current level of 50,572,000 air-dry pounds. However, the usable forage quality is expected to decline as desirable forage species are slowly replaced by less desirable. Table 4-24 summarizes usable forage in pounds and equivalent cattle AUMs.

Table 4-24
Alternative #2 - Useable Forage Summary 1/

	Pounds	AUM's
Present	50,472,000	63,009
20-Year	50,472,000	63,009
Net Gain	0	0

1/ Useable competitive forage at biological limit utilization levels (Approximately 30-50 percent utilization of forage species).

SOILS

The present condition erosional trends are expected to continue and/ or follow the trend in range conditions. There is often a lag between range trend and erosional trends. Vegetation responds quickly to changes in external factors like fire, grazing use, or climatic cycles. Soils respond slow and usually less dramatically. Generally, the range trend in the Snake River Sediments is upward but because they were down for so long, the erosional trends are still at the bottom. Conversely the range trend is generally downward in the uplands and trend is still generally stable in the plateaus. The negative trends would continue except the static areas would split. About 50 percent of those areas would show downward trends and 50 percent upward. Because of the lag time in erosional response, the long-term erosion rates would still be a four percent improvement.

There would be no change in erosion rates on 77 allotments. These allotments are understocked, or express a static or upward range trend. Soil productivity and fertility should remain the same. Seventeen allotments would have increased erosion rates from overstocking and early turn out dates. These allotments have low canopy cover and high soil compaction problems, thus decreasing the ability of water to enter the soil. The increases in erosion rates range from five to nine percent, with the average increase being seven percent. Soil productivity and fertility should decrease. An eight percent decrease in erosion rates from upward range trend would occur on 49 allotments. The decrease in erosion rates varies from five to 27 percent. On these 49 allotments, soil productivity and fertility should improve.

Continuing present grazing intensity would increase the percent of annual vegetative cover on many allotments. Watershed conditions are not considered stable if they are very high in annual plants. When weather conditions are unfavorable for annual germination, vegetative cover is reduced and the watershed is exposed to potential rain and wind storms. Under this alternative, high erosion rates or soil compaction problems would continue and probably become worse on the allotments they affect.

Summary

Seventeen allotments would show an average increase of seven percent in erosion rates, 77 allotments would show no change in erosion rates, and 49 allotments would show an eight percent improvement in erosion rates. In twenty years, the overall annual erosion rates would be four percent (1.12 tons/acre/year to 1.09 tons/acre/year), which is 21 percent higher than the erosion rates which would occur under optimum (excellent) condition.

WATER RESOURCES

Watershed Condition

Upland watershed condition is not expected to change at the current levels of use (Table 4-7). Refer to Chapter 3 for a description of the existing situation.

Water Availability

No change would occur in water availability.

Water Use

No change would occur in water use.

TERRESTRIAL WILDLIFE

There would be a continuation of the existing situation for wildlife as described in Chapter 3. Range in fair ecological condition and in an upward trend would be expected to improve, some even reaching good ecological condition. Range in fair ecological condition and experiencing a downward trend would decline; some areas dropping to poor ecological condition. Range presently in poor ecological condition would mostly remain in poor condition due to the inability of the existing vegetation to significantly improve without livestock grazing changes and range treatment projects. Overall habitat response would show a slight increase in good condition, coupled with a slight increase in poor condition (Table 4-25).

Mule Deer

Competition would continue between livestock and deer. Deer habitat would improve slightly from upward trends, while range in downward trend would decline (Table 4-25). Deer numbers are expected to increase slightly as long as favorable climatic conditions continue to occur. However, due to their less than optimum physical condition, deer numbers would also be expected to decline when adverse weather occurs. This alternative does not meet EIS objectives.

Antelope

Impacts to antelope habitat would be similar to those described for mule deer. Populations would remain small and EIS objectives would not be met.

Bighorn Sheep

The ecological condition of the bighorn sheep range is not expected to change (Table 4-25). Since existing habitat is felt to be satisfactory, population objectives of the EIS would be met.

Sage Grouse

The continuation of current grazing practices is expected to maintain the existing conditions for sage grouse as discussed in Chapter 3. As shown in Table 4-25, sage grouse nesting habitat would improve and decline depending on present range trends. Brood rearing habitat (meadow/riparian area) are expected to respond similarily. Population levels would remain at current levels and the objectives of the EIS would not be met.

Waterfowl

Continuation of current practices is expected to maintain the existing situation for waterfowl as described in Chapter 3.

Meadow/Riparian Associated Wildlife

Habitat would improve in some areas and deteriorate in other areas depending on present range trends (Table 4-25). Overall habitat would continue to be in a less than optimum condition for small mammals, birds and other wildlife. The situation would continue as described in Chapter 3.

Summary

The existing situation as described in Chapter 3 would continue as a result of the no action alternative. Table 4-25 shows that ecological conditions would improve and deteriorate depending on existing range trends in different portions of the EIS area. Because of this, EIS objectives for wildlife would not be met.

Table 4-25
Wildlife Summary/Alternative #2

	Existing Situation (Acres/%)			Impact of Alternative (Acres/%)		
	Good	Fair	Poor	Good	Fair	Poor
Mule Deer						
Summer Range	20,670/ 5%	157,092/ 38%	235,638/ 57%	41,340/ 10%	119,886/ 29%	262,174/ 61%
Winter Range	27,580/ 7%	145,870/ 37%	220,640/ 56%	47,280/ 12%	11,032/ 28%	236,400/ 60%
Antelope	21,375/ 5%	158,175/ 26%	247,950/ 58%	51,300/ 12%	111,150/ 26%	265,050/ 62%
Bighorn Sheep	5,382/ 69%	2,028/ 26%	390/ 5%	5,382/ 69%	2,028/ 26%	390/ 5%
Sage Grouse (nesting)	7,504/ 4%	69,412/ 37%	110,684/ 59%	16,884/ 9%	50,652/ 27%	120,064/ 64%
Meadow/ Riparian Associated Wildlife	485/ 5%	8,730/ 90%	485/ 5%	679/ 7%	7,663/ 79%	1,358/ 14%

AQUATIC WILDLIFE

There would be a continued downward trend in aquatic wildlife components with implementation of this alternative. However adverse impacts to aquatic wildlife components from the present situation would be slight.

WILD HORSES

Continuation of the five-year average livestock use levels would have an adverse effect upon the proposed maximum horse numbers (178) located in the overused allotments. The six allotments containing wild horses would be overutilized by 1,402 AUMs. The quality and quantity of forage would decrease from overgrazing and the range would be severely damaged (Daubenmire 1968). The wild horses might move out of areas of overutilization to meet their forage requirements and possibly migrate out of traditional areas of use. Any horses confined by fences or natural barriers in the above allotments could suffer malnutrition, disease, or starvation. Colt production and survival would decline.

Spring and fall grazing by livestock at the present stocking level would remove forage needed for wild horses. With the current stocking level of wild horses and cattle, competition is very keen for forage. Overutilization of the wild horse's winter range would occur.

Summary

The wild horses would be adversely affected by the overuse associated with this alternative. These horses could be forced into areas not presently used; horses confined by fences or barriers could suffer from decreased forage availability.

CULTURAL RESOURCES

Adverse impacts to cultural resource sites would continue at the same rate as they are occurring at present.

WILDERNESS

Current levels of livestock use would continue, and no project development or prescribed burning would take place. Lands under wilderness review would be managed so their suitability for preservation as wilderness would not be impaired.

Residual effects of this alternative on wilderness values would be to continue current levels of direct livestock impacts on scenic qualities, fish and wildlife habitat, and scientific values of condition of vegetation and soil. No new range improvements would appear on the landscape; temporary and long-term effects of prescribed burning would not occur.

VISUAL RESOURCE MANAGEMENT

This alternative would have slight negative impacts from present downward trends in range and riparian areas. However, no new range improvements are proposed which means no more fencing or new scarring of the area from construction.

RECREATION

General

Off-Road Vehicle Use

There could be some seasonal closures of some livestock areas to ORV use.

Hunting and Fishing

There would be a slight increase in huntable populations of game animals and birds over the existing situation, but the populations of trout would slightly decrease. Hunting and fishing use would increase to levels projected by the 1977 Idaho Outdoor Recreation Plan; however, success ratios would decrease because more sportsmen would be pursuing a relatively fixed number of game species.

Summary

Under the this alternative, there would be decreases in the quality of existing recreation opportunities, especially hunting and fishing. Projected recreation use levels, which are based mostly on regional population growth estimates, would not be affected.

Table 4-26
Recreation Use[1/]

	Existing Situation	No Action
Off-Road Vehicle	175,000	300,000
Hunting	97,585	140,000
Fishing	724	1,000
TOTAL	273,309	441,100

1/ Activity Occasions

LIVESTOCK GRAZING

During the 20 years under this alternative, livestock grazing would continue at the present five-year average (105,009 AUMs). The 111 allotments which are overallocated would probably, in 20 years, have 18,349 fewer AUMS. Thus, their available livestock forage would be only 85,179 AUMs compared to 103,528 AUMs. There are 32 allotments which are underallocated and could have an additional 18,019 AUMs available for allocation over the five year average use. Livestock on the 111 overallocated allotments would probably begin to show weight losses and animals would begin to use less desireable areas and eat plants of low palatability.

Recreational vehical use on spring range would separate mother cows from their calves. It would disrupt the livestock grazing patterns by forcing livestock to use higher elevation summer range to get away from the disturbance. This would cause overuse of the summer range and little or no use on the lower spring range.

Summary

Table 4-27 shows the AUM allocation summary for this alternative. Allotment specific AUM allocation is presented in Appendix Table C-8. This alternative would continue present use levels over a 20-year period. Livestock on overstocked allotments would begin to show weight losses and the condition of livestock on under allocated allotments would improve.

Table 4-27
Summary of AUM Allocation for Alternative #2

	Total Available	Wild-life	Horses	Livestock Allocation	Percent Change*
Initial	105,009	0	0	105,009	-7
20-Year Projection	105,009	0	0	105,009	-7

* The percent change from active preference.

ECONOMICS

Rancher Income

Since this alternative consists of continuing present management (no changes in AUM levels, range improvements or management systems) there would be no economic impact from this alternative. The net present worth of this alternative is $0.

SOCIAL CONDITIONS

Social Values and Attitudes

With no proposed changes in the level of grazing permitted, livestock operators would experience a sense of relief that there would be no changes in their operation dictated by the government. Recreation users would be pleased no reductions in their activities would be necessary. However they would be dissapointed that an alternative providing greater recreation opportunities was not chosen.

ENVIRONMENTAL IMPACTS OF ALTERNATIVE 3
Maximize Wildlife and Watershed Conditions

Summary

Grazing management systems identified in the proposed action would be implemented with stocking rates based on biological limit utilization levels (approximately 30-50 percent). On 44 allotments, turn out dates would be approximately two weeks to one month later than described in the proposed action. Livestock grazing would not be allowed on critical deer winter ranges after September 1. There would be 113 miles of stream fenced to protect riparian habitat and on 36 miles of stream log structures would be placed to discourage livestock trailing along stream bottoms. No vegetative treatment projects would be implemented.

Wildlife would be managed at levels described in the proposed action. Wild horses would be increased to 338 head. Initial livestock use would be 50 percent below current active preference.

VEGETATION

Introduction

Heavy spring use is detrimental to perennial grasses (Craddock and Forsling 1938). Dillion and Wallenmeyer (1966) report one Oregon rancher to say "...when we quit grazing on brunchgrass during May and June, it (the grass) really started to come."

This example, indicates refraining from spring grazing entirely may be the best way to improve bluebunch wheatgrass. Late summer and fall grazing has caused heavy livestock use on browse species (see wildlife section).

For these reasons, seasons-of-use adjustments in this alternative were made to minimize livestock grazing conflicts with plant protection and fall browse use on deer winter ranges. Season-of-use adjustments were not made in grazing systems that already provided plant protection in spring or fall.

Condition and Trend

Before improvements to range condition (from increased plant densities, more desirable plant composition, and improved soil stability) can be realized, individual plant vigor must be improved (Parker 1954). The determination of individual plant vigor response becomes a primary step in predicting condition improvements.

In this alternative, the proposed seasons-of-use and stocking levels adjustments in effect maximize opportunities for the beneficial interaction between the grazing animal and perennial plants. This interaction will spped the vigor recovery of existing plants and improve establishment of new plants (Sampson and Malsten, 1926; Stoddart et. al., 1975). Proper livestock interaction with plants will speed increases in plant vigor and densities with the final result being improved ecological condition (Young et. al., 1976).

Based on an allotment by allotment analysis of present conditions, using the literature discussion and rationale explained in the analysis of the proposed action and Appendix G, the following assumptions were used to predict the 20-year resultant condition class from the grazing management described in this alternative:

1. Condition improvement would be greater than the no grazing alternative because the grazing interactions between plant and animal are more beneficial to the plant than no grazing at all.

2. Areas currently exhibiting upward trends (76,695 acres) would improve two condition classes in 20 years. Plant reproductive vigor on these areas is currently at favorable levels. The condition improvement of these areas was therefore expected to occur more rapidly because there would not be a time period required for vigor improvement. Improvement would be greater than the proposed action because of the reduced stocking levels.

3. Areas currently exhibiting static trends (377,237 acres) would initiate upward trends with approximately one-half to two-thirds of these areas improving one condition class. Plants in these areas do not exhibit the vigor levels required to maintain adequate seed production; however, reproductive vigor recovery will be less than the 6-8 years discussed by Mueggler (1975). Allotments in good and excellent condition were predicted to achieve quicker and greater improvement than those allotments in poor and fair condition (McLean and Tisdale, 1972). Improvement would be greater than the proposed action because of reduced stocking levels.

4. Areas currently exhibiting downward trends (560,365 acres) would exhibit static and upward trends with one-third to one-half of these areas improving one condition class. Plants in these areas currently exhibit low vigor. While the proposed grazing management will improve plant vigor on the areas, the time required for vigor recovery and seedling establishment could be as much as 6-8 years (Mueggler 1975). Perennial grass densities must be improved before condition can improve (Parker 1954). On ranges in poor or fair ecological condition, improvement would be slower than on good condition ranges (McLean and Tisdale, 1972). Improvement would be greater than the proposed action because of reduced stocking rates.

Based on the above assumptions and the resulting analysis, condition and trend would improve from the proposed grazing management (see Table 4-28 for a summary of resultant conditions).

Cover

After the resultant condition class acreages were determined, effective ground cover was recalculated for each allotment using procedures presented in Appendix G. The recalculations indicated that cover response was variable.

Effective ground cover would increase an estimated five to ten percent over the entire area. Cover increases would result from canopy increases on individual plants and increases in herbaceous plant densities.

Productivity

Usable forage available in 20 years was recalculated after 20-year condition class acres were predicted (see Appendix G). Total air-dry useable forage would increase 38,165,600 pounds (equivalent to 47,707 cattle AUMs). Proposed grazing management would increase present average EIS area useable forage (50 pounds per acre) to 87 pounds per acre (see Table 4-29 for a comparison summary of useable forage).

Meadow/Riparian Vegetation

Based on the literature discussion in the proposed action, little or no change is expected in this ecological community. Most of the improvement in this vegetation complex would occur in the riparian portion and result from the installation of protective fencing and log structures (see aquatic wildlife section).

Range Improvements

Impacts would be the same as described in the proposed action.

Summary

The desired ecological condition class acreage stated in the objectives would be attained within the 20-year planning period.

Existing ecological condition on upland and meadow/riparian bottomland would improve from proposed grazing management, range improvements, and riparian area fencing and log structures. A comparison of existing and 20-year ecological conditions is presented in Table 4-28. An allotment specific summary is presented in Appendix Table F-9.

Table 4-28
Condition Class Summary
Alternative #3, for Public Lands in EIS Area 1/

Ecological Condition Class	Initial Ecological Condition: Meadow/Riparian Areas	Initial Ecological Condition: Total EIS Area	20-Year Ecological Condition: Meadow/Riparian Areas	20-Year Ecological Condition: Total EIS Area
Poor	14.5	56.8	2.6	25.1
Fair	78.9	35.2	79.3	35.4
Good	6.6	5.1	18.1	31.4
Excellent	---	0.3	---	5.8
Treated	---	2.6	---	2.3
Total Percent	100.0	100.0	100.0	100.0

1/ Values are in terms of percent of area acres within each condition class. Currently, there are 9,718 acres of meadow/riparian vegetation in the 1,014,296 acre EIS area.

Effective ground cover was calculated to improve five to ten percent of the EIS area.

Grazing management would improve productivity of useable forage by 38,165,600 air-dry pounds. Net increases of useable forage are summarized in Table 4-29. An allotment summary of net livestock AUM production gains is presented in Appendix Table C-10.

Table 4-29
Alternative #3, Useable Forage Summary 1/

	Pounds	AUM's
Existing	50,472,000	63,090
20-Year	88,637,600	110,797
Net Gain	38,165,600	47,707

1/ Useable competitive livestock forage at biological limit utilization levels.

SOILS

Alternative 3 would decrease forage utilization in spring and fall pastures and base turn out dates on plant phenology (see vegetation section). The long-term effect would increase the organic component of the surface layers, which would increase soil fertility, productivity, and the water-holding capacity. This, along with decreased trampling would decrease the effects and potential for soil compaction. Improving canopy cover would increase infiltration rates by breaking up sheet flow and allow more water to enter the soil. The net effect would be a seventeen percent decrease in overall erosion rates (tons/acre/year). This alternative favors range condition and the establishment of perennial plants. This would lower the susceptibility of the ORA to potential erosion when conditions are unfavorable for annual plant germination.

The intensively managed allotments average a seventeen percent improvement in erosion rates; the range being five to 25 percent. The less intensively managed allotments along with the management associated with private land would be handled similar to the proposed action except the seasons-of-use would be adjusted to favor the plants (see vegetation section). These adjustments in season-of-use have improved erosional rates by nineteen and sixteen percent respectively. (Appendix Table H-1). The range of improvement in erosion rates (tons/acre/year) for the latter two levels of management are twelve and 27 percent.

Summary

In twenty years, the annual erosion rates would be seventeen percent (1.12 tons/acre year to 0.93 tons/acre/year), which is eight percent higher than the erosion rates which would occur under optimum (excellent) condition. The intensive, less intensive, and mangement in association with private land levels of grazing management improve erosion rates by seventeen, nineteen, and sixteen percent respectively.

WATER RESOURCES

Watershed Condition

This alternative would create high improvement in overall upland watershed condition (Table 4-7). Increases in ground cover would reduce runoff creating decreased erosion rates. Sediment and other contaminants would remain in a localized area.

The impacts from the construction of 81 springs and 90 reservoirs are the same as discussed in the poposed ation.

Fencing of 113 miles of stream would restrict livestock access to stream channels causing reduced fecal coliform contamination (Stephenson and Street 1977). Improved riparian vegetation in these areas would result, improving water quality.

Pipeline construction impacts are the same as described in the proposed action.

Water Availability

The same as in the proposed action.

Water Use

Water consumption by livestock and wildlife would decrease by nine percent, from 125 acre-feet to 114 acre-feet annually; or .03 percent of the annual water yield.

Water needed for irrigation would not change, but the amount of water available during spring runoff would be reduced slightly from improved vegetation cover.

TERRESTRIAL WILDLIFE

Alternative 3 is designed to maximize wildlife habitat conditions without implementing vegetative treatments. Livestock would be managed to maximize forage and cover for wildlife. Numerous range studies have documented that livestock grazing can be a beneficial tool in improving vegetation and range condition.

As shown in Table 2-12, this alternative would result in the greatest percentage of habitat going to good ecological condition. Wildlife would be expected to achieve their optimum physical conditions. Population numbers would be less apt to fluctuate due to climatic conditions.

Mule Deer

Limiting vegetation utilization by livestock to levels of 30-40 percent would be highly beneficial to mule deer habitat. Forage competition for browse, spring grasses and forbs would significantly decline. Livestock grazing would be used as a management tool to establish and maintain optimum habitat conditions for mule deer. For example, livestock would control the abundance of grasses and forbs on winter ranges, thereby reducing grass competition and allowing new shrub seedlings to become established. Livestock would also be used to stimulate browse species through a pruning effect.

Alternative 3 is the most desireable action to improve mule deer habitat and animal condition (Table 4-30). Increased vegetative cover and forage would increase deer productivity, thereby creating more deer for potential harvest by sportsmen. This alternative would eliminate late fall livestock grazing on deer winter range and improve browse conditions.

Management objectives for mule deer habitat condition and population numbers would be met.

Antelope

Limiting vegetation utilization by livestock to levels of 30-40 percent would be highly beneficial to the antelope habitat. Nutrition would be enhanced from an increase in forb and browse species. This alternative would meet EIS management objectives for antelope habitat and populations.

Bighorn Sheep

Lower levels of livestock use in bighorn/livestock overlap areas would provide additional forage for bighorns. However, the existing habitat situation is satisfactory and improvements would be slight (Table 4-30). EIS objectives for bighorn would be met.

Sage Grouse

As shown in Table 4-30, sage grouse habitat would improve. Nesting habitat would improve due to the predicted increase in understory from proper livestock management. Brood rearing habitats (meadow/riparian associated wildlife) would also improve from good livestock management practices and protective fencing programs. EIS objectives would be met.

Waterfowl

Since this alternative would develop reservoirs and provide protective fencing similar to the proposed action, impacts would be essentially the same as those described in the proposed action.

Riparian Associated Wildlife

As shown in Table 4-30, riparian (stream) habitats are expected to improve from the increased amount of protective fencing that would be established along streams. Meadows would improve slightly from the continued livestock use that would occur in these preferred areas. This alternative would partially meet EIS objectives for riparian associated wildlife.

Summary

Alternative 3 would provide the greatest habitat improvements for most species of wildlife. Since livestock would continue to utilize reservoirs and meadows intensively, only slight improvements would occur to waterfowl habitat and sage grouse brood rearing areas.

Dense stands of juniper and sagebrush would not be significantly improved since this alternative does not call for vegetative treatment in these areas. Approximately 21-24 percent of the mule deer, antelope and sage grouse habitats would remain in poor ecological condition.

Table 4-30
Wildlife Summary/Alternative #3

	Existing Situation (Acres/%)			Impact of Alternative (Acres/%)		
	Good	Fair	Poor	Good	Fair	Poor
Mule Deer						
Summer Range	20,670/ 5%	157,092/ 38%	235,638/ 57%	152,958/ 37%	169,494/ 41%	90,948/ 22%
Winter Range	27,580/ 7%	145,780/ 37%	220,640/ 56%	153,660/ 39%	157,600/ 40%	82,740/ 21%
Antelope	21,375/ 5%	158,175/ 37%	247,950/ 58%	166,725/ 39%	162,450/ 38%	98,325/ 23%
Bighorn Sheep	5,382/ 69%	2,028/ 26%	390/ 5%	6,318/ 81%	1,092/ 14%	390/ 5%
Sage Grouse (nesting)	7,504/ 4%	69,412/ 37%	110,684/ 59%	67,536/ 36%	75,040/ 40%	45,024/ 24%
Meadow/ Riparian Associated Wildlife	485/ 5%	8,730/ 90%	485/ 5%	1,746/ 18%	7,663/ 79%	291/ 3%

AQUATIC WILDLIFE

The same techniques were applied for impact analysis of each of the aquatic wildlife component headings below as were presented in the proposed action.

Fisheries Habitat Condition

The overall fisheries habitat condition on the 421 stream miles would be as follows:

	Fisheries Habitat Condition			Impact Category			
	Poor	Fair	Good	No Change	Slight Improvement	Improve to Fair	Improve to Good
Present Situation	51%	36%	13%				
10-Year Condition	13%	50%	37%	27%	29%	19%	25%
20-Year Condition	3%	38%	59%	24%	13%	17%	46%

Water Quality and Quantity

Since 10.5 stream miles would improve to good habitat condition in ten years and 195 miles in twenty years, water quality and quantity component improvement in these stream reaches should be similar to those outlined by stream miles of fencing with implementation of the proposed action. These would include 3-11°F cooler maximum summer temperatures, decreases in the amount of stream bottom covered with silt, stream channel narrowing and pool depth increases, and more even streamflows throughout a year in these stream reaches. The overall water quality and quantity conditions for trout in the 42 EIS streams would improve as follows:

	Water Quality and Quantity		
	Poor	Fair	Good
Present Situation	57%	43%	0%
10-Year Condition	37%	50%	13%
20-year Condition	11%	71%	18%

Aquatic Macro-Invertebrates

Percentage composition of species should show a trend toward increases in aquatic insects such as stoneflies and mayflies which are associated with good water quality.

The overall changes in community richness and fish food abundance on the 42 EIS streams would be as follows:

	Community Richness			Fish Food Abundance		
	Poor	Fair	Good	Poor	Fair	Good
Present Situation	38%	45%	17%	26%	62%	12%
10-Year Condition	33%	38%	29%	25%	54%	21%
20-Year Condition	7%	60%	33%	4%	70%	26%

Fish Population

Trout numbers and biomass would increase as follows:

	Trout Numbers	Pounds of Trout
Present Situation	76,000	4,000
10-Year Condition	210,000	20,000
20-Year Condition	251,000	25,000

Fish species composition of stream areas with habitat improvement should show increased percentages of redband trout and sculpins versus other fish species. Adult sizes of redband trout should increase in these same stream areas from 5-7 inches to eight inches or greater.

Eight streams presently without trout populations should have a high potential to support trout in twenty years. One EIS stream would remain with little potential to support trout.

Summary

The aquatic wildlife components would improve as indicated in the previous discussion. Of the 113 stream miles included in the stream management objective of the proposed action, three-fourths would improve to good condition in ten years. The stream management objective of attaining fair fisheries habitat condition on 99 percent of the EIS stream mileage in twenty years would be met.

WILD HORSES

The major benefit to wild horses from this alternative would be the additional forage (4,431 AUMs). The forage requirements necessary to maintain a healthy, balanced herd in all allotments except Rats Nest do not seem to be the limiting factor for maximum horse populations. However, space is limiting on ridges utilized for loafing and escape from flies. The additional forage allocation and space requirement would allow a four percent increase in the wild horse population (324 to a maximum of 338).

Wild horses would benefit from better diets due to the decreased forage competition with livestock. Livestock would receive smaller forage allocations than presently used (five-year average). Of the forage (11,284 AUMs) produced within these six allotments, 39 percent would be allocated to the wild horses. However, all six allotments would be managed under AMPs; thus the benefits from additional forage could be decreased because of possible movement restrictions from additional fences.

When the total forage capacities are reached in all allotments containing wild horses, periodic removals would be necessary to maintain forage productivity and adequate space requirements.

Summary

Most wild horses would benefit from the additional available AUMs. Implementation of rotation systems for livestock grazing management, installation of range improvement projects and vegetation manipulation projects would have the same impacts as the proposed action. It is impossible to quantify the difference in intensity of impact, but the lower stocking level of cattle would reduce the impact.

CULTURAL RESOURCES

The implementation of grazing systems at the biological limits instead of the 50 percent utilization levels would decrease adverse impacts on cultural resource sites from livestock trampling and erosion. Adverse and beneficial impacts from the implementation of water development projects and stream fencing would be the same as described for the proposed action.

WILDERNESS

Reduced livestock use, later turn out dates, stream fencing in addition to that outlined in the proposed action, and project development as outlined in the proposed action, characterize this alternative. No prescribed burning would occur. Lands under wilderness review would be managed so their suitability for preservation as wilderness would not be impaired.

Residual effects of new range improvements on wilderness values would introduce some new, nonimpairing man-made features; temporary and long-term effects of prescribed burning would not occur. Beneficial effects on scenic qualities, fish and wilderness-associated wildlife habitat, and scientific values of vegetation and soil condition would result from reduced grazing, later turn out dates and additional stream fencing.

VISUAL RESOURCE MANAGEMENT

This produces positive impacts through improved range management and riparian fencing. However, lack of some vegetative manipulation would maintain the same uniform brush and tree cover described for Alternative 1.

RECREATION

General

Recreation opportunities would improve over the present situation at a rate greater than the proposed action.

Off-Road Vehicle Use

Construction of fences and spring closure of portions of popular ORV areas would adversely impact this activity.

Hunting and Fishing

Improved habitat condition for fish and wildlife would create a population buildup of game species. Trout would increase from 76,000 to 97,000 in twenty years, while huntable populations of mule deer would nearly triple. Upland game birds, waterfowl, and antelope number would also increase. By the year 2000, there would be a 25 percent increase in hunting and a 55 percent increase in fishing over projected levels.

Summary

Although impacts are similar to the proposed action, recreation opportunities would improve under this alternative. Increases in hunting and fishing opportunities would be especially noticeable. The following table summarizes of estimates future recreation use (activity occasions) with and without implementation of Alternative #3:

Table 4-31
Recreation Use 1/

	Existing Situation	Alt. #3 Year 2000	No Action Year 2000 2/
Off-Road Vehicle	175,000	300,000	300,000
Hunting	97,585	175,000	140,000
Fishing	724	1,700	1,100
TOTAL	273,309	476,700	441,100

1/ Activity Occasions

2/ This represents a continuation of current trends

LIVESTOCK GRAZING

The implementation of this alternative would mean that six allotments would have 4,431 AUMs of livestock forage allocated to wild horses. On the Rats Nest allotment (#522), all available AUMs (344) would be allocated to wild horses. Seventeen allotments would have an increase (39 percent) from 3,747 AUMs (active preference) to 5,196 AUMs. Livestock would be reduced 54 percent on 94 allotments from 109,375 AUMs to 50,569. There would be 32 additional allotments, or public lands fenced with private, where 742 AUMs of forage have never been authorized.

To compensate for reductions in AUMs or loss of grazing on public lands, livestock operators would have to buy hay, lease pasture, reduce numbers, or rely on grazing privileges on other public land (e.g state).

Impacts to the livestock operators concerning adjustments in AUMs made are discussed in the social and economic sections.

In twenty years, there should be an increased production of forage for livestock (47,548 AUMs) from grazing management systems. However, this 103,313 AUM level would still be about nine percent below active preference.

Summary

The alternative calls for a 50 percent overall reduction in livestock use from active preference. The majority of this reduction would be on 111 allotments which would have a net reduction of 54 percent from active preference. In twenty years, this alternative, with the help of grazing management systems, would increase the AUM level by 85 percent (103,313 AUMs) from the initial alternative level but not to active preference (113,122 AUMs). The following table shows the summary of AUM allocation for this alternative. For allotment specific AUM allocation see Appendix Table C-10.

Table 4-32
Summary of AUM Allocation for Alternative #3

	Total Available	Wild-life	Horses	Livestock Allocation	Percent Change*
Initial	63,090	2,152	4,431	56,507	-50
20-Year Projection	110,797	2,152	4,431	104,214	- 8

* The percent change from active preference.

ECONOMICS

Rancher Income

This alternative would impose a 49 percent reduction in AUMs from current active preference. It would be a 47 percent reduction from the five-year (1974-78) average actual use. Table 4-33 shows the alternative AUMs by size group and the AUM changes from active preference and average use.

Ranchers could adjust to these reductions as identified in the proposed action. The remainder of this analysis is based on the substitution of hay for Bureau of Land Management AUMs and vice versa (as in the proposed action). Changes in AUM levels are measured against the five-year average actual use levels as in the proposed action.

To replace lost AUMs with purchased hay (or hay held back from sale) would cost permittees $736,000 annually in net income. This represents Three percent of the regional farm income. If all the losses occurred in Owyhee County (which they do not) they would represent 43 percent of that county's farm income. These annual losses would continue until AUMs which are gained from range improvements and management systems are reallocated to the permittees. By the tenth year after implementation, 49 percent of the lost AUMs would be regained, reducing the annual net income loss to $360,000. By the fifteenth year, 73 percent of the AUMs would be regained, further reducing the annual net income loss to $200,000. In the long-term, 20 years or more after implementation, approximately 99 percent of the AUMs would be regained, reducing the annual net income loss to $7,000. Table 4-34 shows the average change per operator by size group for both the short and long terms. The table shows that in the short-term, this alternative would cost permittees between $4,700 and $13,000 annually and would reduce net family income from 24 to 29 percent. In addition, there are 42 permittees who would have their AUMs reduced by 50 percent or more, four permittes who are reduced ten percent or less, and four who receive increases in AUMs in the short-term.

Table 4-33
Owyhee EIS Area
Size Group Data
Alternative 3

Group	Herd Size	Number of Cattle	Number of Cattle	Active AUMs	Average AUMs	Proposed AUMs 1/	Loss from Active		Loss from Average	
							Number	Percent	Number	Percent
1	0-149	1,340	0	7,599	7,592	3,389	4,210	55%	4,203	55%
2	150-399	7,429	0	22,284	22,584	12,114	10,170	46%	10,470	46%
3	400+	26,801	12,200	83,239	74,833	40,262	42,977	52%	34,566	46%
TOTAL	---	35,570	12,200	113,122	105,009	55,765	57,357	49%	49,239	47%

1/ Excludes those areas not previously licensed (i.e. fenced federal ranges, pasture 3 of allotment 515, allotments 610, 618, 620 and 621).

Table 4-34
OWYHEE EIS
Income Changes By Group
Alternative 3

Size Group	Base Income (see Chap 3)	Average Short-Term			Average Long-Term			Short-Term Variations (AUM Change)		
		Change* (dollars)	Revised Income	Percent Change	Change* (dollars)	Revised Income	Percent Change	Number w/50% or greater Reduction	Number w/10% or less Reduction	Number with Increases
1	$16,394	- $ 4,692	$11,702	-29%	- $ 989	$15,405	-6%	13	0	1
2	$25,605	- $ 6,142	$19,463	-24%	- $1,536	$24,069	-6%	11	1	1
3	$49,193	- $13,143	$36,050	-27%	+ $ 796	$49,989	+2%	18	3	2

* These impacts to rancher income have been calculated through the use of ranch budgeting and linear programming techniques which are explained in Appendix L.

SOURCE: Bureau of Land Management, Idaho State Office, January 1980.

The net present worth of the change in rancher net income would be -$6.2 million.

The total rancher income losses could be considerably larger since this alternative calls for large reductions in spring grazing. Such reductions force ranchers to hold cattle on their private lands, preventing their use of that land for hay and grain production. This additional impact is not, however, quantifiable.

Regional Income

In the three-county EIS study area, approximately $262,000 in net income would be gained over the five-year construction schedule. In addition, there would be $155,000 gained from 20 years of maintenance of these projects. The remainder of the range improvement costs would be incurred outside the region. This direct impact to the region's construction industry would have no secondary impacts on the remainder of the regional economy.

The net present worth of range improvement construction and maintenance to the regional economy would be +$287,000.

The direct income loss to the ranching community would cause secondary losses to the livestock industry and other sectors of the regional economy. During the first ten years of this alternative, there would be secondary income losses of $287,000 annually. This would be less than one-tenth one percent of the regional non-farm income. The major industries impacted would be livestock (-$40,000), other agriculture (-$45,000), food and related products (-$39,000), other manufacturing (-$40,000), transportation and communications (-$40,000), and wholesale and retail trade (-$40,000). In years eleven through fifteen, the secondary income loss would be $140,000 annually; in years sixteen through twenty, the secondary loss would be $80,000 annually. The same industries would be impacted during these time spans as during the first ten years.

The net present worth of these livestock-related secondary annual income changes would be -$2.4 million.

This alternative would increase the number of hunting and fishing days above that expected if no action is taken (recreation section). At the end of 20 years there would be approximately 600 additional fishermen days and 35,000 additional hunter days. Based on income per hunter and fisherman day data (U.S.D.A. 1979), the net income in the services and retail trade sectors of the economy would increase to $370,000 annually by the twentieth year. Secondary income gains throughout the entire economy from recreation gains would be up to $46,000 by the twentieth year.

The net present worth of these recreation-related income gains would be $1.8 million.

The total net present worth to the regional economy from implementing this alternative (over 20 years) would be -$6.5 million and is comprised of the following:

Direct Livestock Losses	-\$6.2 million
Secondary Livestock Losses	-\$2.4 million
Range Improvements	+\$0.3 million
Recreational Use	+\$1.8 million

Employment

There would be a direct loss of 69 jobs in the livestock industry due to this alternative. By the tenth year there would be seventeen direct jobs gained in services and retail trade from increased recreational use. There would be 25 secondary losses through year ten, the major losers being the livestock industry (-3 jobs), food and related products (-5 jobs), other manufacturing (-5 jobs), and wholesale and retail trade (-5 jobs). By the end of the fifteenth year, the total employment losses would be eighteen jobs (in other words a total of 78 jobs would have been gained back). By the twentieth year, the employment losses would be eliminated and twelve jobs would be gained (recreation-related).

Ranch Consolidation

This section is based on the same assumptions used in the proposed action.

The number of permittees who would have difficulty remaining in business would be:

Group	Number of Permittees
1	5
2	7
3	13
Total	25

These operators would have the same options as identified in the proposed action.

Capital Position

The impacts to capital position under this alternative would be similar to the proposed action except more severe.

Other Impacts

This alternative would cost the federal government \$2.2 million over 20 years for installation and maintenance of range improvements. This would have a net present worth of \$1.6 million.

Over the first ten years of the alternative, the federal government would collect \$100,000 less in grazing fees (50,000 AUMs x \$2 AUM) annually. From years eleven to fifteen, the collections would be \$50,000 less annually and from years sixteen to twenty, they would be \$26,000 less annually. These reductions in grazing fee collections would have a net present worth of \$840,000.

Summary

The annual regional net income changes from in the livestock industry would have a net present worth of $-8.6 million. Changes in the regional economy from range improvement construction and maintenance would have a net present value of +$300,000. Regional income changes from increased recreational use would have a net present worth of $1.8 million. Total employment losses would be 77 jobs through year ten, eighteen jobs by year fifteen, and by year twenty, employment losses would be eliminated and twelve jobs gained. At least 25 permittees would have difficulty remaining in business.

The net present worth to the federal government of range improvements and maintenance would be -$1.6 million. The present worth to the state and federal governments from reduced grazing fee receipts would be -$840,000.

The total net present worth of this alternative (regional, state, federal) would be -$8.9 million.

SOCIAL CONDITIONS

Social Values and Attitudes

Under this alternative 25 of 83 permittees or 30 percent may have difficulty remaining in business. There would be four permittees or five percent that would realize increases above their five-year average use. The effects on the social values and attitudes of the ranchers and communities would be similar to those discussed in the proposed action, except there would be more reductions and less increases in AUMs. Recreation users would be pleased with the improved recreation opportunities provided by this alternative.

ENVIRONMENTAL IMPACTS OF ALTERNATIVE 4
Sixty Percent Utilization Level

Summary

This alternative would implement grazing management systems as described in the proposed action except stocking rates on intensive management allotments would be based on 60 percent utilization levels in place of 50 percent utilization levels. Initial livestock use (93,921 AUMs) would be seventeen percent below current active preference. Protective fencing of stream and riparian habitat would not occur. However, log structures would be placed on 149 stream miles to discourage livestock trailing along stream bottoms.

VEGETATION

Introduction

An average utilization (50 percent) of the key species over a number of years is a reasonable expression of proper use for most grassland ranges (Heady 1952). Hughes (1979) reported that average utilization exceeding 55 percent caused increased range deterioration even though areas were under grazing systems.

Adoption of this alternative would create a twenty percent increase of stocking rates over the proposed action. The adverse impacts described in the proposed action would be more severe in this alternative, because of the higher stocking levels.

Condition and Trend

Grazing Management:

Before improvements to range condition (from increased plant densities, more desirable plant composition and improved soil stability) can be realized, individual plant vigor must first be improved (Parker 1954). The determination of individual plant vigor response becomes a primary step in predicting condition improvements.

Based on an allotment by allotment analysis of present conditions, using the literature discussion and rationale explained in the proposed action and Appendix G, the following assumptions were used to predict the twenty-year resultant condition from grazing management:

1. Condition on eleven allotments (52,211 acres) would decline from grazing system failure and increased stocking (see proposed action, Table 4-1).

2. Condition improvement would be greater than the no grazing alternative because the grazing interactions between plant and animal are more beneficial than no grazing at all.

3. Areas currently exhibiting upward trends (76,695 acres) would improve one condition class in ten to twenty years. Plant reproductive vigor on these areas is currently at favorable levels. The condition improvement of these areas was therefore expected to occur more rapidly because there would not be a time period required for vigor improvement. Improvement would be less than the proposed action because of the increased stocking levels.

4. Areas currently exhibiting static trends (377,237 acres) would initiate upward trends with one-fourth to one-third of these areas improving one condition class in twenty years. Plants in these areas do not exhibit the vigor levels required to maintain adequate seed production; however, reproductive vigor recovery will be less than the 6-8 years discussed by Mueggler (1975). Allotments in good and excellent condition were predicted to achieve quicker and greater improvement than those allotments in poor and fair condition (McLean and Tisdale, 1972). Improvement would be less than the proposed action because of increased stocking levels.

5. Areas currently exhibiting downward trends would exhibit static to upward trends but would not impove enough to jump a condition class. Plants in these areas currently exhibit low vigor. While the proposed grazing management will improve plant vigor on the areas, the time required for vigor recovery and seedling establishment could be as much as 6-8 years (Mueggler 1975). Perennial grass densities must be improved before condition can improve (Parker 1954). On ranges in poor or fair ecological condition, improvement would be slower than on good condition ranges (McLean and Tisdale, 1972). Improvement would be less than the proposed action because of increased stocking rates.

Based on the above assumptions and the resulting analysis, overall EIS area condition and trends would improve from the proposed grazing management (see Table 4-35 for a summary of condition).

Table 4-35
Condition Class Summary
From Grazing Management in Alternative #4 1/

	Condition Class				
	Poor	Fair	Good	Excellent	Treated
Current Situation	56.8	35.2	5.1	0.3	2.6
20-Year Situation	49.2	31.2	16.4	1.4	1.8

1/ Values are in terms of percent of area acres within each condition class.

Land Treatments:

See impact discussion of this item in the proposed action.

Cover

Grazing Management:

After the resultant condition class acreages were determined, effective ground cover was recalculated for each allotment using procedures presented in Appendix G. The recalculations indicated the cover response was variable.

On eighteen allotments (69,725 acres), cover was calculated to remain unchanged because of grazing management failures due to their poor design and heavier stocking levels. On the remaining allotments (944,571 acres), cover improvements were calculated to range from one to ten percent. This wide range of cover improvement reflects the amount of condition change expected after an allotment by allotment analysis (Appendix Table F-10).

Land Treatments:

See impact discussion of this item in the proposed action.

Productivity

Grazing Management:

Useable forage available in twenty years was recalculated after 20-year condition class areas were predicted (see Appendix G). Total air-dry useable forage would increase 14,238,400 pounds (equivalent to 17,798 cattle AUMs). Proposed grazing management would increase present average EIS area useable forage (78 pounds per acre) to 92 pounds per acre.

Land Treatments:

Impacts would be the same as those described for the proposed action. Useable forage would increase 33,346,400 air-dry pounds (equivalent to 41,683 cattle AUMs).

Meadow/Riparian Vegetation

Grazing Management:

Based on the proposed action literature discussion (page 4-4), little or no condition change is expected in this ecological community. What changes that would be realized (some areas improving from poor to fair) are contributed to reducing existing livestock numbers and the implementation of grazing systems. A summary of condition is presented in Table 4-36.

Land Treatments:

See impact discussion of this item in the proposed action.

Range Improvements

See impact discussion of this item in the proposed action.

Summary:

The objective of improving ecological condition, as stated in the proposed action description (Chapter 2) would not be attained within the twenty year period.

Exisiting ecological condition on uplands and meadow/riparian bottomland will improve from proposed management, land treatments and range improvements. A comparison of existing and twenty-year ecological conditions is presented in Table 4-36. An allotment specific summary of condition is presented in Appendix Table F-10.

Table 4-36
Condition Class Summary Alternative #4
for Public Lands in EIS Area 1/

Ecological Condition Class	Initial Ecological Condition Meadow/Riparian Areas	Initial Ecological Condition Total EIS Area	20-Year Ecological Condition Meadow/Riparian Areas	20-Year Ecological Condition Total EIS Area
Poor	14.5	56.8	6.2	33.1
Fair	78.9	35.2	87.2	23.7
Good	6.6	5.1	6.6	16.4
Excellent	---	0.3	---	1.4
Treated	---	2.6	---	25.4 2/
TOTAL PERCENT	100.0	100.0	100.0	100.0

1/ Values are in terms of percent of area acres within each condition class. Currently there are 9,718 acres of meadow/riparian vegetation in the 1,014,596 acre EIS area.

2/ Treatment acres correspond to acres previously in the poor and fair ecological condition classes.

Effective ground cover would have a net improvement of one to ten percent from existing cover on 944,571 acres. Cover on the remaining 69,725 acres would remain unchanged.

Grazing management would improve productivity of useable forage by 14,238,400 pounds. Land treatments would provide an additional 33,346,400 pounds of useable forage. Assuming the optimum diets presented in Appendix C, this increase would fall short of an optimum diet quality because part (approximately 25 percent) of the useable forage would come from less desireable species (see wildlife, wild horses, and livestock sections). Net increases of useable forage are summarized in Table 4-37. Net livestock AUM production gains are presented in Appendix Table C-11 for all of the allotments.

Table 4-37
Alternative #4 Useable Forage Summary 1/

	Pounds	AUMs
Existing	78,721,600	98,402
20-Year	126,306,400	157,883
Net Gain	47,584,800	59,481

1/ Useable competitive livestock forage at 60 percent utilization levels on intensive management allotments, and biological limit utilization levels on other allotments.

SOILS

The impacts of land treatments and project development would be the same as the proposed action. The land treatment areas would remove some pressure from the surrounding untreated areas. This combined with postponing turn out dates and adjusting stocking rates accounts for the most improvement in erosion rates. These adjustments improve soil compaction and increase ground cover which directly affect the way the soil would absorb water. Increasing cover and infiltration rates would decrease runoff and erosion and favor the soils productive capabilities. Soil fertility levels would be insignificantly improved.

The lack of protective management on streams and riparian zones would cause a further decline in condition. Continued trampling and overutilization would increase soil erosion in these riparian zones and provide a less effective buffer zone for sheet erosion (See watershed and aquatic wildlife sections).

The intensively managed allotments would improve an average of seven percent while the other two levels of management would remain as the proposed action. No change in erosion rates would show in nineteen allotments. This is because the improvements created by the land treatments would be offset by overstocking (see vegetation section). The remaining 124 allotments would show an average improvement of nine percent in erosion rates (tons/acre/year) with the range being from three to 25 percent. The net result is a seven percent improvement in erosion rates (Appendix Table H-1).

Summary

The long-term annual soil erosion rates would decrease by an average of seven percent (1.12 tons/acre/year to 1.04 tons/acre/year). This is eighteen percent higher than the erosion rate which would occur under optimum, (excellent) watershed condition. The short-term impacts and the impacts of the allotments with less intensive management and management in association with private land are the same as the proposed action. The intensively managed allotments would decrease erosion rates an average of six percent.

WATER RESOURCES

Watershed Condition

Upland watershed condition would show little to no improvement on intensively and less intensively managed allotments. Improvements that occur are mainly the result of land treatment projects. Those allotments in the category managed with private lands show an overall watershed improvement which would be the result of increased ground cover and reduced erosion rates (Table 4-7).

The impacts from land treatment projects and those associated with spring, reservoir, and pipeline construciton are the same as discussed in the proposed action.

Water Availability

The same as in the proposed action.

Water Use

Water consumed by livestock and wildlife would increase 35 percent. This increase is not considered significant relative to the total annual water yield (0.04 percent of total annual water yield).

Water needed for irrigation would not change.

TERRESTRIAL WILDLIFE

Upland wildlife habitat would improve. Sixty percent vegetation utilization levels would provide more forage and cover for wildlife. Since riparian habitats would not be fenced, their improvements would be slight.

Mule Deer

Impacts to deer would be similar to those expressed in the proposed action. Due to the additional ten percent utilization levels designed in this alternative, deer habitat condition would be less than optimum, and populations, while reaching management objectives, would be more apt to fluctuate if severe climatic conditions are encountered.

Antelope

Compared to the impacts of the proposed action, 60 percent utilization levels would slightly decrease the amount of forage available to antelope. Nutritional stress may increase from increased competition for desirable forbs and shrubs. While populations may reach EIS objectives, physical condition of the antelope would not be optimum and their numbers could be subject to fluctuation.

Bighorn Sheep

Vegetation in areas used by cattle and bighorns would decline in productivity and species composition. Over time, this may adversely affect the bighorn population. In the short run, however, EIS objectives would be met.

Sage Grouse

Sage grouse nesting and brood habitat would improve from the present situation. However, the improvement would not be as significant as described in the proposed aciton. Sage grouse habitat condition would partially increase to meet EIS objectives (Table 4-38).

Waterfowl

Impacts to waterfowl habitat would be similar to those described in alternative #2.

Meadow/Riparian Associated Wildlife

Compared to the existing situation, implementation of this alternative would show some improvement of riparian habitat, although the condition changes are confined to improvement from poor to fair. No additional good condition habitat is expected (Table 4-38).

The shift from poor to fair is expected to benefit small mammals, quail and passerine birds. The response of beaver and otter populations is expected to be slight.

Summary

Alternative #4 would cause an overall improvement to upland habitats. Riparian habitats would be improved slightly from the failure of this alternative to call for protective fencing of streams. Mule deer and antelope populations may reach EIS objectives, but due to less than optimum physical conditions, these populations could fluctuate.

Table 4-38
Wildlife Summary/Alternative #4

	Existing Situation (Acres/%)			Impact of Alternative (Acres/%)		
	Good	Fair	Poor	Good	Fair	Poor
Mule Deer						
Summer Range	20,670/ 5%	157,092/ 38%	235,638/ 57%	70,278/ 17%	219,102/ 53%	124/020/ 30%
Winter Range	27,580/ 7%	145,870/ 37%	220,640/ 56%	74,860/ 19%	204,880/ 52%	114,260/ 29%
Antelope	21,375/ 5%	158,175/ 26%	247,950/ 58%	183,825/ 43%	111,150/ 26%	132/525/ 31%
Bighorn Sheep	5,382/ 69%	2,028/ 26%	390/ 5%	5,382/ 69%	1,560/ 20%	858/ 11%
Sage Grouse (nesting)	7,504/ 4%	69,412/ 37%	110,684/ 59%	30,016/ 16%	97,552/ 52%	60,032/ 32%
Meadow/ Riparian Associated Wildlife	485/ 5%	8,730/ 90%	485/ 5%	679/ 7%	8,439/ 87%	582/ 6%

AQUATIC WILDLIFE

The same techniques were applied for impact analysis of each of the aquatic wildlife component headings below as were presented in the impact analysis for each component heading under the proposed action analysis.

Fisheries Habitat Condition

The overall fisheries habitat condition on the 421 stream miles would be as follows:

	Fisheries Habitat Condition			Impact Category			
	Poor	Fair	Good	No Change	Slight Improvement	Improve to Fair	Improve to Good
Present Situation	51%	36%	13%				
10-Year Condition	47%	40%	13%	53%	43%	4%	0
20-Year Condition	11%	76%	13%	41%	19%	40%	0

Water Quality and Quantity

There would be little improvement in water quality and quantity conditions for trout in stream reaches on public lands in ten years and twenty years. This is because the majority of the habitat condition changes are slight and the onsite impacts creating water quality and quantity problems would continue on a large portion of the EIS mileage. The overall changes in water quality on the 42 EIS streams would be as follows:

	Water Quality and Quantity		
	Poor	Fair	Good
Present Situation	57%	43%	0
10-Year Condition	55%	45%	0
20-year Condition	53%	47%	0

Aquatic Macro-Invertebrates

There would be little overall change in community richness, fish food abundance, or aquatic insect species composition in the 42 EIS streams as shown below:

	Community Richness			Fish Food Abundance		
	Poor	Fair	Good	Poor	Fair	Good
Present Situation	38%	45%	17%	26%	62%	12%
10-Year Condition	37%	46%	17%	24%	64%	12%
20-Year Condition	35%	47%	18%	21%	66%	13%

Fish Populations

Trout numbers and biomass would increase as follows:

	Trout Numbers	Pounds of Trout
Present Situation	76,000	4,000
10-Year Condition	119,000	9,000
20-Year Condition	145,000	12,000

Summary

Impacts on aquatic wildlife components in ten and twenty years would be as previously indicated. Neither the stream management objective of attaining good condition in ten years on the 113 miles shown on Map 2-2 nor the stream objective of attaining fair condition on 99 percent of the EIS mileage in twenty years would be met.

WILD HORSES

A 24 percent increase of 3,184 livestock AUMs in the six allotments within the wild horse management areas would not benefit the wild horses. It would increase their competition for forage with livestock.

Impacts to wild horses from an increase in livestock numbers and future forage production would be similar to the proposed action.

Summary

The wild horse benefits would decrease from increased competition from livestock. The removal of excess horses would have a negative impact on those animals that are moved since it would mean a loss of their native range.

CULTURAL RESOURCES

Impacts to cultural resource sites would increase slightly over those presently occuring because livestock concentrations would increase on some areas that currently receive little livestock use.

WILDERNESS

Slightly higher levels of livestock use than in the proposed action, project development and prescribed burning as in the proposed action, characterize this alternative. No stream fencing would occur. Lands under wilderness review would be managed so their suitability for preservation as wilderness would not be impaired.

Residual effects on wilderness values would introduce some new man-made features in the form of nonimpairing range improvements. Wilderness resources of natural vegetation, soil condition and wilderness-associated wildlife habitat, excluding riparian habitat, would slightly improve through changes in grazing systems and numbers. Significant impacts on fish and riparian habitat would continue from lack of stream protection. Temporary impacts on natural processes and visual resources in prescribed burn areas would be created with a potential for long-term beneficial effects on wildlife and ecological diversity.

VISUAL RESOURCE MANAGEMENT

This produces low impact and negative results. The worst impacts result because there is no riparian protection.

RECREATION

Off-Road Vehicle Use

Impacts would be the same as the proposed action.

Hunting and Fishing

There would be a slight increase in numbers of fish and wildlife with a corresponding slight increase in opportunities for fishing and hunting. By the year 2000, there would be a seven percent increase in hunting and a eighteen percent increase in fishing uses over projected levels.

Summary

Under this alternative, there would be slight increases in all recreation opportunities. Projected recreation use levels would remain the same, except for slight increases in hunting and fishing. The following table summarizes estimated future recreation use (activity occasions) with and without implementation of Alternative #4:

Table 4-39
Recreation Use 1/

	Existing Situation	Alt. #4 Year 2000	No Action Year 2000 2/
Off-Road Vehicle	175,000	300,000	300,000
Hunting	97,585	150,000	140,000
Fishing	724	1,300	1,100
TOTAL	273,309	451,300	441,100

1/ Activity Occasions
2/ These figures represent a continuation of current trends

LIVESTOCK GRAZING

Impacts to livestock grazing under this alternative would be similar to those discussed in the proposed action (livestock grazing section) with the following exceptions:

(1) Forty-two allotments would be closer to their active preference by 11,542 AUMs. An additional eight allotments would exceed their active preference by 869 AUMs.

(2) After 20 years there would be approximately 141,355 AUMs of livestock forage available compared to the present 113,122 AUMs; an increase of 35 percent.

(3) One allotment (#450) would have no change from active preference.

(4) Since riparian zones are not being fenced, the livestock entrapment would not occur.

(5) Increases in AUMs from grazing management would be less by 4,459 AUMs (22,257 to 17,191).

Impacts to livestock operators are discussed in the social and economics sections of this alternative.

Summary

Livestock grazing should benefit, with 11,542 additional AUMs allocated on all allotments in comparison to the proposed action. Livestock forage production would improve from 113,122 AUMs to 141,355 AUMs in twenty years through grazing management and vegetation manipulation. Table 4-40 shows the AUM allocation summary for this alternative. Allotment specific AUM allocation is presented in Appendix Table C-11.

Table 4-40
Summary of AUM Allocation for Alternative #4

	Total Available	Wild-life	Horses	Livestock Allocation	Percent Change*
Initial	98,402	2,152	2,329	93,921	-17
20-Year Projection	157,883	2,152	2,329	153,402	+36

* The percent change from active preference.

ECONOMICS

Rancher Income

This alternative would impose an eighteen percent reduction in AUMs from current active preference. It would be an eleven percent reduction from the five-year (1974-78) average actual use. Table 4-41 shows this alternative's AUMs by size group and the AUM changes from active preference and average use.

Ranchers would adjust to these reductions as identified in the proposed action. The remainder of this analysis is based on the substitution of hay for Bureau of Land Management AUMs and vice versa (as in the proposed action). Changes in AUM levels are measured against the five-year average actual use levels as in the proposed action.

To replace lost AUMs with purchased hay (or hay held back from sale) would cost permittees $148,000 annually in net income. This represents one half of one percent of the regional farm income. If all the losses occurred in Owyhee county (which they do not) they would represent nine percent of that county's farm income. These annual losses would continue until AUMs gained from range improvements and management systems are reallocated to the permittees. By the tenth year after implementation, 37 percent of the lost AUMs would be regained, reducing the annual net income loss to $93,000. By the fifteenth year, 55 percent of the AUMs would be regained, further reducing the annual net income loss to $67,000. In the long-term, 20 years or more after implementation, there would be 45 percent more AUMs than the average actual use. This would increase net income to the permittees by $680,000 annually.

Table 4-42 shows the average change per operator by size group for the short and long-terms. The table shows in the short-term, this alternative would cost permittees between $190 and $2,746 annually and reduce net family income from one to six percent. In addition, there are seventeen permittees who would have their AUMs reduced by 50 percent or more, ten permittees who are reduced ten percent or less, and 34 who receive increases in AUMs in the short-term.

The net present worth of the change in rancher net income in years one through 20 would be -$1.3 million.

Regional Income

In the three-county EIS study area, approximately $535,000 in net income would be gained over the 20 year construction schedule. In additon, there would be $111,000 gained from 20 years maintenance of these projects. The remainder of the range improvement costs would be incurred outside the region. This direct impact on the region's construction industry would have no secondary impacts on the remainder of the regional economy.

The net present worth of range improvement construction and maintenance to the regional economy would be +$250,000.

Table 4-41
Owyhee EIS Area
Size Group Data
Alternative 4

Group	Herd Size	Number of Cattle	Number of Sheep	Active AUMs	Average AUMs	Proposed AUMs 1/	Loss from Active		Loss from Average	
							Number	Percent	Number	Percent
1	0-149	1,340	0	7,599	7,592	6,860	739	10%	732	11%
2	150-399	7,429	0	22,284	22,584	19,927	2,357	11%	2,657	12%
3	400+	26,801	12,200	83,239	74,833	66,392	16,847	20%	8,436	11%
TOTAL	---	35,570	12,200	113,122	105,009	93,179	19,943	18%	11,825	11%

1/ Excludes those areas not previously licensed (i.e. fenced federal ranges, pasture 3 of allotment 515, allotments 610, 618, 620 and 621).

Table 4-42
Owyhee EIS
Income Changes By Group
Alternative 4

		Average Short-Term			Average Long-Term			Short-Term Variations (AUM Change)		
Size Group	Base Income (see Chap 3)	Change* (dollars)	Revised Income	Percent Change	Change* (dollars)	Revised Income	Percent Change	Number w/50% or greater Reduction	Number w/50% or less Reduction	Number with Increases
1	$16,394	- $ 190	$16,204	-1%	+ $ 5,013	$21,407	+31%	4	2	9
2	$25,605	- $ 1,583	$24,022	-6%	+ $ 6,159	$31,764	+24%	5	3	13
3	$49,193	- $ 2,746	$46,447	-6%	+ $11,415	$60,608	+23%	8	5	12

* These impacts to rancher income have been calculated through the use of ranch budgeting and linear programming techniques which are explained in Appendix L.

SOURCE: Bureau of Land Management, Idaho State Office, January 1980.

The direct income loss to the ranching community would cause secondary losses to the livestock industry and other sectors of the regional economy. During the first ten years of this alternative there would be secondary income losses of $59,000 annually. This would be less than one tenth of one percent of the regional non-farm income. The major industries impacted would be livestock (-$8,000), other agriculture (-$10,000), food and related products (-$8,000), other manufacturing (-$8,000), transportation and communications (-$8,000) and wholesale and retail trade (-$8,000). In years eleven through fifteen, the secondary net income loss would be $37,000 annually while in years sixteen to 20 it would be $27,000. The same industries would be impacted during these time spans as during the first ten years.

The net present worth of these livestock-related secondary annual income losses would be -$530,000.

This alternative would increase the number of hunting and fishing days above that expected if no action is taken (see recreation section). After 20 years, there would be approximately 200 additional fishermen days and 10,000 additional hunter days. Based on income per hunter and fisherman day data (U.S.D.A. 1979), the net income in the services and retail trade sectors of the economy would increase to $106,000 annually by the twentieth year. Secondary income gains throughout the entire economy the recreation gains would be up to $13,000 by the twentieth year.

The net present worth of these recreation-related income gains would be $517,000.

The total net present worth to the regional economy from implementing this alternative (over 20 years) would be -$1.0 million and is comprised of the following:

Direct Livestock Losses	-$1.3 millon
Secondary Livestock Losses	-$0.5 million
Range Improvements	+$ .3 million
Recreation Use	+$ .5 million

Employment

There would be a direct loss of thirteen jobs in the livestock industry from this alternative. By the tenth year there would be five direct jobs gained in services and retail trade from increased recreational use. There would be four secondary job losses through year ten; the major losers being the livestock industry (-1), and wholesale and retail trade (-1). By the end of the fifteenth year, the total employment losses would be four jobs (in other words a total of 114 jobs would have been gained back). By the twentieth year, the employment losses would be eliminated and three jobs would be gained (recreation-related).

Ranch Consolidation

This section is based on the same assumptions used in the proposed action.

The number of permittees who would have difficulty remaining in business would be:

Group	Number of Permittees
1	2
2	5
3	7
TOTAL	14

These operators would have the same options as identified in the proposed action.

Capital Position

Next to Alternative 2 and Alternative 5, this alternative would have the least impact on capital position. The impacts would be similar to the proposed action only less severe.

Other Impacts

This alternative would cost the federal government $4.2 million over 20 years for installation and maintenance of range improvements, and have a net present worth of $2.6 million.

Over the first ten years of the alternative, the federal government would collect $40,000 less in grazing fees (20,000 AUMs x $2/AUM) annually. From years eleven to fifteen, the collections would be $32,000 less annually and from years sixteen to 20, they would be $18,000 less annually. These reductions in grazing fee collections would have a net present worth of $370,000.

Summary

The annual regional net income changes from changes in the livestock industry would have a net present worth of -$1.8 million. Changes in the regional economy from range improvement construction and maintenance would have a net present value of +$0.3 million. Regional income changes from increased recreational use would have a net present worth of $517,000. Total employment losses would be twelve jobs in years one to ten, four jobs by year fifteen, and by year 20, employment would be eliminated and three jobs gained. At least fourteen permittees would have difficulty remaining in business.

The net present worth to the federal government of range improvements and maintenance would be -$2.6 million. The present worth to the state and federal governments from reduced grazing fee receipts would be -$370,000.

The total net present worth of this alternative (regional, state, federal) would be -$4.0 million.

SOCIAL CONDITIONS

Social Values and Attitudes

This alternative may cause fourteen of 83 permittees, or seventeen percent to consider ceasing business. The effects of these reductions would be similar to but less severe than those described in the proposed action. Of 83 permittees, 41 percent, would receive increases in AUMs. In these cases, the operators would have more confidence and positive feelings toward government and their future as ranchers.

ENVIRONMENTAL IMPACTS OF ALTERNATIVE 5
Maximum Livestock Use

Summary

Grazing management systems would be implemented without changing existing AUM levels (113,122) or seasons-of-use. Water development and pasture fencing would remain as described in the proposed action. Protective stream fencing or special riparian management practices would not occur. Maximum acreages of land treatment are proposed (brush control 154,000 acres; brush control and seeding 198,000 acres; Map 2-5). These range treatment projects would be designed to maximize livestock forage production and would not contain mutiple use design features. Wild horses would be managed at levels described in the proposed action. No specific forage allocation is made to wildlife.

VEGETATION

Introduction

The initial stocking rates (active preference levels) used in this alternative have a direct bearing on prediction of vegetation impacts. More adverse impacts (similar to alternative #2) would result in those allotments where current carrying capacities (calculated from 1977-1978 inventory) are less than active preference levels. On the other hand, more beneficial impacts (similar to proposed action) would result in those allotments where current carrying capacities exceed active preference levels (see livestock section).

Condition and Trend

Grazing Management:

Before improvements to range condition can be realized, individual plant vigor must be improved (Parker 1954). The determination of individual plant vigor response becomes a primary step in predicting condition improvements.

An average utilization (50 percent) of the key species over a number of years is a reasonable expression of proper use for most grassland ranges (Heady 1952). Hughes (1979) reported that average utilization exceeding 55 percent caused increased range deterioration even though areas were under grazing systems. Average utilization required to maintain active preference in 40 allotments (273,860 acres) was calculated to be in excess of 70-75 percent even though these allotments were scheduled for treatment. Grazing management on these allotments is predicted to fail. The overstocking would accelerate deterioration of the residual native range and proposed land treatments to the point of overobligation (see livestock section). A list of these allotments where grazing systems are predicted to fail because of overutilization of the forage resource is presented in Table 4-43.

Table 4-43
Allotments Predicted to Fail from Overutilization of Forage

500	507	531	566	580	588	598	607
501	510	533	569	582	589	599	608
502	511	544	573	585 1/	590	601	611
503	518	554	574	586	591	602	612
504	529	559	578 1/	587	594	606	625

1/ These allotments were previously predicted to show no condition response (Table 4-1, proposed action vegetation impact section). They are now predicted to show condition declines, because of overutilization of forage.

Based on the allotment by allotment analysis of present conditions, using the literature discussion and rationale explained in the proposed action and Appendix G, the following assumptions were used to predict the twenty-year resultant condition from grazing management:

1. Condition on nine allotments (36,246 acres) would not change because of grazing system failure (Note: allotments 578 and 585 are now covered in assumption 2). See Table 4-1, proposed action vegetation impact section.

2. Condition on 40 allotments (273,860 acres) would decline from high utilization (70-75 percent) levels. See Table 4-43, this section.

3. Condition on 468,902 acres would remain unchanged because utilization levels would remain unchanged (see introductory remarks of this section). Impacts are assumed to follow rational in "No Action" alternative #2 relative to grazing management.

4. Condition on 233,288 acres would improve because stocking rates are below the current carrying levels (see introductory remarks of this section). Impacts are assumed to follow rational in proposed action and "Maximize Wildlife" alternative #3 relative to grazing management.

Based on the assumptions above and the resulting analysis, condition and trend would improve on only 233,288 acres from the proposed grazing management (see Table 4-44 for summary of condition).

Table 4-44
Condition Class Summary
From Grazing Management in Alternative #5 1/

	Condition Class				
	Poor	Fair	Good	Excellent	Treated
Current Situation	56.8	35.2	5.1	0.3	2.6
20-Year Situation	59.2	26.9	10.8	1.8	1.3

1/ Values are in terms of percent of area acres within each condition class.

Land Treatments:

Treatment impacts would be the same as described in the proposed action (Map 2-5). Appendix G describes how treatment acreages are calculated into net condition responses of appropriate alternatives. Implementation of the treatments proposed in this alternative would require treatment of 228,703 acres (22.5 percent of EIS area) currently in poor condition and 123,147 acres (12.1 percent of EIS area) currently in fair condition.

Cover

Grazing Management:

After the resultant condition class acreages were determined, effective ground cover was recalculated for each allotment using procedures in Appendix G. The recalculations indicated that cover response was variable.

Cover would decline (three to five percent) on 273,860 acres, remain unchanged on 507,140 acres, and improve five to ten percent on 233,288 acres (see condition trend section above for rationale description).

Land Treatments:

Treatment impacts would generally be the same as those described in the proposed action except cover is assumed to decline on treated areas (three to five percent) in the same fashion as the native range in those allotments listed in Table 4-43.

Productivity

Grazing Management:

Useable forage available in twenty years was recalculated after twenty-year condition class acres were predicted (Appendix G).

Native useable forage on 233,288 acres would improve about 9,725,600 air-dry pounds (approximately 42 pounds per acre). Increases are attributed to improvement of grazing management.

Native useable forage on 273,860 acres would decrease 8,857,600 air-dry pounds (approximately 32 pounds per acre). Decreases are directly attributed to decline of range condition from increased grazing utilization (see condition and trend discussion above).

Forage production on the balance of the native ranges (50 percent of area) would remain unchanged (see livestock section for further discussion). Net forage gain from grazing management would be 868,000 air-dry pounds (1,085 AUMs) of useable forage (approximately one pound per EIS area acre).

Land Treatments:

Treatment impacts would generally remain as described in the proposed action section. However, treatment of an additional 112,905 acres (66,220 acres of poor condition range and 46,685 acres of fair condition range) would require sites to be chosen that are less productive. As a consequence, chances of failure are increased. Net gains of productivity, due to treatments, were recalculated to indicate reduced success, because of site selection and increased stocking levels. Net gains from treatment were recalculated to be 41,109,600 air-dry pounds from existing levels or an average increase of 41 pounds per EIS area acre.

Meadow/Riparian Vegetation

Grazing Management:

Based on the literature discussion in the proposed action, the condition of these areas is expected to decline further in light of the additional stocking levels (active preference as opposed to five-year average, increase of 8,113 AUMs), and the AUM overobligation in 40 allotments (11,072 AUMs). See Table 4-45 for a summary of resultant condition.

Land Treatments:

See impact discussion of this item in the proposed action.

Range Improvements

See impact discussion of this item in the proposed action.

Summary

The objective of improving ecologial condition, as stated in the proposed action would not be attained.

Existing ecological condition on upland areas would improve on 233,288 acres. Condition would remain unchanged on 507,148 acres and decline on the remaining 273,860 acres. A comparison of existing and twenty-year ecological conditions is presented in Table 4-45. An allotment specific summary is presented in Appendix Table F-11.

Table 4-45
Condition Class Summary Alternative #5
for Public Lands in EIS Area 1/

Ecological Condition Class	Initial Ecological Condition Meadow/Riparian Areas	Initial Ecological Condition Total EIS Area	20-Year Ecological Condition Meadow/Riparian Areas	20-Year Ecological Condition Total EIS Area
Poor	14.5	56.8	21.1	36.7
Fair	78.9	35.2	72.3	14.7
Good	6.6	5.1	6.6	10.8
Excellent	---	0.3	---	1.8
Treated	---	2.6	---	36.0 2/
TOTAL PERCENT	100.0	100.0	100.0	100.0

1/ Values are in terms of percent of area acres within each condition class. Currently there are 9,718 acres of meadow/riparian vegetation in the 1,014,596 acre EIS area.

2/ Treatment acres correspond to acres previously in the poor and fair ecological condition classes.

Cover would decline (three to five percent) on 273,860 acres, remain unchanged on 507,148 acres, and improve five to ten percent on 233,288 acres from condition class changes.

Grazing management would improve productivity of useable forage by 868,000 pounds. Land treatments would provide an additional 41,109,600 pounds of useable forage. Net increases of useable forage are summarized in Table 4-46 an allotment summary of net livestock AUM production gains is presented in Appendix Table C-12.

Table 4-46
Alternative #5, Useable Forage Summary 1/

	Pounds	AUMs
Existing	66,253,600	82,817
20-Year	108,231,200	135,289
Net Gain	41,977,600	52,472

1/ Useable competitive livestock forage at 50 percent utilization levels on intensive management allotments, and biological limit utilization levels on other allotments.

SOILS

The impacts are similar to the proposed action except 198,000 additional acres would be treated. This additional acreage would be applied to less productive soils and/or to soils whose slopes occur dominantly between 20 and 50 percent. These would cause an increase in allotment erosion rates. The erosion rates in this section are based on the predicted vegetative cover responses (see vegetation section).

As slopes increase, the value used in Musgrave's soil loss equation increases (Table 4-47). The right-hand column shows the difference or the increase in the slope value as slope increases by five percent. In other words, as slope increases, the erosion rates increase; but erosion rates increase proportionately more, as the the slope becomes steeper.

Table 4-47
The Effects of Slope on Erosion Rates in Musgrave's Analysis

Percent Slope	Musgrave's Slope Value	Change in slope for every five percent increase in slope
5	0.39	0.39
10	1.00	0.61
15	1.73	0.73
20	2.55	0.82
25	3.45	0.90
30	4.41	0.96
35	5.43	1.02
40	6.50	1.07
45	7.62	1.12
50	8.78	1.16

Alternative #5 has a high potential for accelerated erosion because land treatment would be applied to dominantly steeper slopes than the proposed action. Land treatment efforts would be successful. Many additional land treatment projects would be done on soils with lower fertility and production capacities. The recovery response, the amount of vegetative production, and the canopy cover of the additional 198,000 acres would be lower than the original 154,000 acres.

In the intensively managed allotments, eleven allotments increased erosion rates an average of twelve percent, 25 allotments have no change, and 34 allotments decreased erosion rates an average of ten percent. These improvements in erosion rates are from the grazing systems combined with the response of the land treatments. The allotments with no change in erosion rates would be due to the improvement of the land treatment combined with overstocking. The increased erosion rates are from overstocking. The net result of the 70 intensively managed allotments is a five percent improvement in erosion rates (tons/acre/year) from present condition.

In the less intensively managed allotments, three allotments increased erosion rates approximately thirteen percent, nine allotments show no change, and three allotments show an eighteen percent improvement. Twelve allotments do not show improved erosion rates because of overstocking and season-of-use (vegetation section). The net affect of the fifteen less intensively managed allotments is a nine percent improvement in erosion rates (tons/acre/year) from present condition.

In the allotments associated with private land, four allotments increased in erosion rates by fourteen percent, fifteen allotments showed no change, and 39 allotments showed a twenty percent improvement in erosion rates. These results are from the predicted change in vegetation cover (vegetation section). The net affect of these 58 allotments is a ten percent improvement in erosion rates (tons/acre/year) from present condition.

The impacts of early turn out dates, overstocking, and proposed land treatments increase the susceptibility of the soil to accelerated erosion rates. Land treatment on 352,000 acres over the next fifteen years would ultimately cause accelerated erosion on individual allotments where unfavorable and unpredicted weather patterns develop during land treatments. If a particular land treatment fails, the erosion rates would be close to the last column in Appendix Table H-1. The additional land treatments would further decrease the grazing pressure from the surrounding untreated land. Soil productivity levels would increase on allotments with decreased erosion rates, decrease on allotments with increased erosion rates, and should remain the same if the erosion ratios do not change. Soil compaction would increase on the 67 allotments that do not show a reduction in erosion rates.

Summary

No change in erosion rates would show on 49 allotments, eighteen allotments would show a thirteen percent increase and 76 allotments would show a fifteen percent decrease in erosion rates. The long-term annual soil erosion rate would decrease by an average of six percent (1.12 tons/acre/year to 1.05 tons/acre/year). This is nineteen percent higher than the erosion rates which would occur under optimum (excellent) watershed conditions.

WATER RESOURCES

Watershed Condition

Upland watershed condition would show slight to no improvement (Table 4-7).

Impacts associated with spring, reservoir, and pipeline construction are the same as the proposed action.

Land treatments on approximately 352,000 acres would create short-term increases in runoff and sedimentation (Lusby 1979). As ground cover is reestablished, it would reduce runoff and sedimentation to levels below pretreatment levels.

Water Availability

The same as in the proposed action.

Water Use

Water consumption by livestock and wildlife would increase about 34 percent to 168 acre-feet annually. This represents approxmiately 0.04 percent of the annual water yield.

Water needed for irrigation purposes would not change.

TERRESTRIAL WILDLIFE

This alternative would create the poorest quality habitat and lowest population numbers of wildlife. The failure to provide a forage allocation to wildlife and the elimination of multiple use considerations in the proposed projects would adversely impact all species. As shown in Table 4-48, a considerable portion of the wildlife habitat would decline to poor ecologic condition.

Mule Deer

Competition between livestock and deer would increase beyond present conditions. The implementation of grazing systems would improve the understory component of the habitat slightly, but heavy browse utilization is expected to occur on fall and winter use areas. Significant adverse impacts to deer nutrition and subsequent losses in productivity would be expected. Mule deer EIS objectives would not be met under this alternative.

Antelope

Competition between livetock and antelope would increase beyond present conditions. The implementation of grazing systems would create a slight beneficial impact, but the adverse impacts of not reducing stocking rates and conducting range treatment without regard to antelope needs, would outweigh any beneficial impacts. As a result, antelope carrying capacities would be expected to decline. Antelope EIS objectives could not be achieved under this alternative.

Bighorn Sheep

This alternative would create a forage competition problem between livestock and bighorn for bluebunch wheatgrass. The reduced availability of this key species to bighorn is expected to cause the population to decline. It is expected that bighorns would avoid areas used intensively by livestock. This reduction in habitat available to bighorn would probably be more adverse to the population than the reduction of forage.

Sage Grouse

Under this alternative, sage grouse would be more adversely affected than under any other management action proposed. Most nesting and brood rearing habitats would lack adequate cover and forage, and the sage grouse population would decline. Vegetation treatments to maximize livestock production would eliminate large areas of sage grouse habitat.

Waterfowl

Under this alternative, waterfowl habitat would continue to decline. Nesting success and brood survival would be slightly lower than under the existing situation.

Meadow/Riparian Associated Wildlife

Compared to other management proposals, this action would create the worst situation for riparian habitats (Table 4-48). Correspondingly, riparian associated wildlife populations would be expected to decline. However, due to the inaccessibility of certain riparian habitat to livestock, no riparian associated wildlife species are expected to be lost.

Summary

Alternative #5 provides the least amount of wildlife habitat. All species would decline and EIS objectives would not be met.

Table 4-48
Wildlife Summary/Alternative #5

	Existing Situation (Acres/%)			Impact of Alternative (Acres/%)		
	Good	Fair	Poor	Good	Fair	Poor
Mule Deer						
Summer Range	20,670/ 5%	152,092/ 38%	235,638/ 57%	53,742/ 13%	74,412/ 18%	285,246/ 69%
Winter Range	27,580/ 7%	145,780/ 37%	220,640/ 56%	59,100/ 15%	66,980/ 17%	267,920/ 68%
Antelope	21,375/ 5%	158,175/ 26%	247,950/ 58%	55,575/ 13%	72,675/ 17%	299,250/ 70%
Bighorn Sheep	5,382/ 69%	2,028/ 26%	390/ 5%	4,758/ 61%	1,0638 21%	1,404/ 18%
Sage Grouse (nesting)	7,504/ 4%	69,412/ 37%	110,684/ 59%	22,512/ 12%	31,892/ 17%	133,196/ 71%
Meadow/ Riparian Associated Wildlife	485/ 5%	8,730/ 90%	485/ 5%	679/ 7%	6,984/ 72%	2,3037 21%

AQUATIC WILDLIFE

There should be slight adverse impacts to all aquatic community components over the present situation with implementation of this alternative. Aquatic conditions should get slightly worse because of the use of the grazing systems proposed without any adjustment in utilization levels of livestock or stream mitigation.

WILD HORSES

Since this alternative does not take into account forage allocation for wildlife and wild horses, Black Mountain, Sands Basin, Rats Nest and River Group allotments would be overused by 1,621 AUMs.

The wild horses in Shares Basin and Reynolds Creek allotments could benefit under this alternative, since after wild horse and livestock AUM requirements are figured, there would be 514 noncompetitive AUMs left, or 40 animals.

Development of grazing systems for livestock grazing management, range improvement projects and vegetation manipulation projects would have the same impacts as in the proposed action.

Summary

The impacts to wild horses under this alternative in the four allotments (same as above) would be greater due to the higher level of grazing by livestock. Wild horses confined by fences and barriers would suffer from decreased forage availabilaity. A population decline would be expected.

CULTURAL RESOURCES

The adverse impact to cultural resources from livestock trampling and erosion would increase moderately over current levels due to increased livestock concentrations in some pastures. Indirect impacts resulting from range improvement projects would also increase moderately over those described for the proposed action since larger acreages are proposed for treatment.

WILDERNESS

Lands under wilderness review would be managed so their suitability for preservation as wilderness would not be impaired.

Residual effects on wilderness values would include introducing some new man-made features in the form of nonimpairing range improvements. The prescribed burning program would create noticeable temporary effects on scenic quality and natural processes, and adverse short and long-term impacts on wilderness-associated wildlife. Current levels of direct livestock impacts on scenic qualities, fish and wildlife habitat, and scientific values of vegetation and soil condition would continue.

VISUAL RESOURCE MANAGEMENT

This alternative proposes removal of vegetation from one-third of the area which would be obvious to visitors. While limited manipulation would increase the variety in the scenery, the large area proposed for treatment would create unnatural openings. There would be large areas of exposed soil and black stems and trunks as a result of burning. Thus, the tree and brush covered areas would suffer loss of visual quality. Heavy grazing would adversely impact the grassy areas, and denude the riparian areas.

RECREATION

General

If this alternative was followed, recreation opportunities would suffer adverse impacts from decreased natural values and vegetative conditions and conflicts with livestock in areas of concentrated grazing.

Off-Road Vehicle Use

Proposed removal of brush in areas to be designated as open to ORV and snowmobile use would enhance opportunities for cross-country travel. Other impacts would be the same as the proposed action.

Hunting and Fishing

Fish and wildlife populations would not increase over the existing situation and may even decrease. As recreation use increases from regional population growth, the quality of hunting and fishing would decline since success ratios would decrease. By the year 2000, projected use levels for hunting and fishing would decline seven percent and nine percent respectively due to decreases in opportunities.

Summary

Under this alternative, there would be decreases in the quality of most existing recreation opportunities, especially hunting and fishing. Future hunting and fishing use would not increase as much as projected, while other future activity uses would remain the same. The following table summarizes estimated future recreation use (activity occasions) with and without implementation of alternative #5.

Table 4-49
Recreation Use 1/

	Existing Situation	Alt. #5 Year 2000	No Action Year 2000
Off-Road Vehicle	175,000	300,000	300,000
Hunting	97,585	130,000	140,000
Fishing	724	1,000	1,100
TOTAL	273,309	431,000	441,000

1/ Activity Occasions

2/ These figures represent a continuation of current trends.

LIVESTOCK GRAZING

There would be no change from active preference of 113,122 AUMs; therefore, no direct impacts to the livestock operators would be realized.

The contribution of grazing management systems would increase AUMs on 45 allotments by 12,157 AUMs. However, there would be an overobligation of 11,072 AUMs on 40 allotments within 20 years, even with land treatments. This would cause weight loss to the grazing animals. Therefore, the net gain from grazing systems would be offset by the losses from overobligated AUMs creating one percent increase over the EIS area. Net AUMs from land treatments would increase by nineteen percent over active preference.

Summary

There would be a 29 percent increase in livestock use above active preference. Forty allotments would be overobligated and could severely impact livestock. The remaining allotments with land treatments would maintain or exceed their active preference level. The following table shows the AUM allocation summary for this alternative. Allotment specific AUM allocation is presented in Appendix Table C-12.

Table 4-50
Summary of AUM Allocation for Alternative #5

	Total Available	Wild-life	Horses	Livestock Allocation	Percent Change*
Initial	113,122	--	--	113,122	0
20-Year Projection	146,361	--	--	146,361	+29

* The percent change from active preference.

ECONOMICS

Rancher Income

This alternative assumes usage of the current active preference by the permittees. This would be an eight percent increase from the five-year (1974-78) average actual use. Table 4-51 shows the proposed AUMs by size group and the AUM changes from active preference and average use.

It is assumed that permittees would use these extra AUMs to substitute for hay. This substitution would increase net rancher income by $97,000 annually. This represents less than one percent of the regional farm income. If all the gains occurred in Owyhee County (which they do not), they would represent six percent of that county's farm income. This gain would remain at the same level until after the twentieth year when the range manipulations (spraying, chaining, seeding, etc.) come into full use. At that time, there would be 39 percent more AUMs available to permittees than their current average actual use. Thus, in the long-term there would be a net income gain to ranchers of $602,000 annually.

Table 4-52 shows the average change per operator by size group for the short and long-terms. The table shows impacts to the average rancher would vary from a loss of $128 to a gain of $2,794 annually.

The net present worth of the change in rancher net income would be +$1.0 million.

Regional Income

In the three-county study area approximately $1.2 million in net income would be gained over the 20-year construction schedule. In addition, $112,000 would be gained from 20 years of maintenance of these projects. The remainder of the range improvement costs would be incurred outside the region. This direct impact to the region's construction industry would have minor secondary impacts on the remainder of the economy.

The net present worth of range improvement construction and maintenance to the regional economy would be +$730,000.

The direct income gains to the livestock industry would cause secondary gains in other sectors of the regional economy. This gain would be $35,000 annually.

The net present worth of these secondary income gains would be +$370,000.

The number of hunting and fishing days would decrease to a level below that expected if no action is taken (recreation section). After the end of 20 years there would be approximately 100 fewer fisherman days and 10,000 fewer hunter days. Based on income per hunter and fisherman-day data (U.S.D.A 1979), the net income in the services and

Table 4-51
Owyhee EIS Area
Size Group Data
Alternative #5

Group	Herd Size	Number of Cattle	Number of Sheep	Active AUMs	Average AUMs	Proposed AUMs 1/	Change from Active		Change from Average	
							Number	Percent	Number	Percent
1	0-149	1,340	0	7,599	7,592	7,599	0	0	+ 7	+> 1%
2	150-399	7,429	0	22,284	22,584	22,284	0	0	- 300	- 1%
3	400+	26,801	12,200	83,239	74,833	83,239	0	0	+8,411	+ 11%
TOTAL	---			113,112	105,009	113,122	0	0	+8,118	+ 8%

1/ Excludes those areas not previously licensed (i.e. fenced federal ranges, pasture 3 of allotment 515, allotments 610, 618, 620 and 621).

Table 4-52
Net Income Changes by Group
Alternative 5

Size Group	Base Income (see Chap 3)	Average Short-Term			Average Long-Term			Short-Term Variations (AUM Change)		
		Change* (dollars)	Revised Income	Percent Change	Change* (dollars)	Revised Income	Percent Change	Number w/50% or greater Reduction	Number w/10% or less Reduction	Number with Increases
1	$16,394	- $ 0	$16,394	---	+ $ 4,287	$20,681	+26%	0	8	4
2	$25,605	- $ 128	$25,477	-> 1%	+ $ 5,359	$30,964	+21%	0	11	9
3	$49,193	+ $ 2,794	$51,987	+ 6%	+ $ 8,122	$57,315	+17%	0	11	18

*These impacts to rancher income have been calculated through the use of ranch budgeting and linear programming techniques which are explained in Appendix L.

SOURCE: Bureau of Land Management, Idaho State Office, January 1980.

retail trade sectors of the economy would decrease $106,000 annually by the twentieth year. Secondary income losses throughout the entire economy from the recreation losses would reach $13,000 by the twentieth year.

The net present worth of these recreation-related income losses would be $515,000.

The total net present worth to the regional economy from implementing this alternative (over 20 years) would be +$1.6 million and would be comprised of the following:

Direct Rancher Gains	+$1.0 million
Secondary Rancher Gains	+$0.4 million
Range Improvements	+$0.7 million
Recreational Use	-$0.5 million

Employment

There would be a gain of nine jobs in the livestock industry and nine jobs in the construction industry from this alternative. By the tenth year, there would be five direct jobs lost in the services and retail trade from decreased recreational use. There would be two jobs gained throughout the remainder of the economy as a secondary impact. By the end of the fifteenth year, total employment gains would be reduced to thirteen (in other words two jobs would have been lost). By the twentieth year, the total employment gains would be reduced to ten jobs.

Ranch Consolidation

Some ranch consolidation would continue, but it is not possible to estimate how much. Any consolidations would occur due to market conditions or retirement of ranchers, etc., and not the allocation of federal grazing privileges.

Capital Position

The alternative would have no impact on capital position.

Other Impacts

This alternative would cost the federal government $6.5 million over 20 years for installation and maintenance of range improvements.

It would have a net present worth of $3.7 million.

There would be an annual increase in grazing fee collecitons of $16,000 (8,000 AUMs x $2/AUM). These increased grazing fee collections would have a net present worth of $170,000.

Summary

The annual regional net income changes from changes in the livestock industry would have a net present worth of +$1.4 million. Changes in the regional economy from range improvement construction and maintenance would have a net present worth of +$700,000. Regional income changes from decreased recreational use would have a net present worth of -$515,000. Total employment gains would be fifteen jobs through year ten, thirteen jobs by year fifteen, and ten jobs by the twentieth year. This alternative would not cause permittees to go out of business.

The net present worth of range improvements and maintenance would be -$3.7 million to the federal government. The present worth to the state and federal governments form increased grazing fee receipts would be +$170,000.

The total net present worth of this alternative (regional, state, federal) would be -$1.9 million.

SOCIAL CONDITIONS

Social Values and Attitudes

This alternative would not require any significant reduction of AUMs. The social values and attitudes of the ranchers and the community would be more positive based on relief that changes to their operation and lifestyle would not be dictated by the federal government. There may be a softening of resentment toward the BLM that has built over many years; and finally ranchers would begin to feel more secure about their future in the Owyhee Resource Area.

Recreation users would feel that because of a reduction in hunting and fishing opportunities they have again lost ground to the influence of what they perceive to be the dominant user of the area, livestock operators.

MITIGATION MEASURES

The following mitigation measures will be implemented to minimize adverse impacts identified in Chapter 4 should the proposed action, alternative 3, alternative 4 or alternative 5 be selected.

1. Grazing systems would be effectively implemented on allotments 557, 572 and 597 by managing these allotments in conjunction with private land.

2. The existing land treatment projects in allotments 585 and 542 will receive priority for retreatment.

3. Grazing systems or stocking rates will be modified on allotments with pasture level carrying capacity imbalances (513, 514, 522, 521 pasture 4 and 525) if actual use and condition and trend studies do not indicate resource improvement.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY AND IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The relationships between the short-term use of the EIS area and its long-term productivity are shown in Table 4-53. Also shown are how the irreversible and irretrievable commitment of resources compare to these uses.

Short-term uses cover a time span of up to 20 years. Long-term productivity goes beyond 20 years. Irreversible means once an action is initiated, it would continue indefenitely. Irretrievable means once a resource is used it cannot be replaced. Energy losses and destruction of archaeological resources are examples.

Table 4-53

Relationship Between Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity and Irreversible or Irretrievable Commitments of Resources

	Short-Term Use	Long-Term Productivity	Irreversible	Irretrievable
Proposed Action	Initially, there would be an annual income loss to ranchers of $367,000. After 10 years there would be a net annual income loss of $290,000 and a loss of $128,000 after 15 years Slight soil erosion in first few years from construction of range improvements.	35% more available AUMs would equal a net income gain of $520,000 annually to ranchers 20 years or more after implementation. The potential for soil erosion loss would decrease by 9%. Hunting and fishing opportunities would increase with increased wildlife habitat and aquatic productivity.	None	Potential data loss from undiscovered cultural resource sites Money, fuel, and material used to develop the project. Short-term loss of income to livestock operators. Slight short-term topsoil displacement caused by project development or land treatments. Potential for 21 livestock operators not being able to remain in business in their present form.
Alternative #1 No Livestock Grazing	Annual income loss to ranchers of $1.5 million.	High increase in aquatic productivity. Increased wildlife habitat productivity. The potential for soil erosion loss would decrease by 18%.	None	Loss of 139 jobs in the livestock industry. Potential for 43 livestock operators not remaining in business in their present form.
Alternative #2 No Action	Present uses would continue.	Decreased aquatic and wildlife habitat productivity. Decreased weight gains in livestock on public land. The potential for soil erosion loss would decrease by 4% through continuation of present trends.	None	Continued livestock impact on 63 known cultural resources sites.
Alternative #3 Maximize Wildlife & Watershed	Initially, there would be an annual income loss to ranchers of $736,000. Forage increases would reduce this annual loss to $360,000 after 10 years and $200,000 after 15 years.	Increased aquatic and wildlife habitat productivity. The potential for soil erosion loss would decrease by 17%. Annual net income loss to ranchers would be $7,000.	None	Slight short-term topsoil displacement caused by project development. Potential for 25 livestock operators not remaining in business in their present form.
Alternative #4 60% Use Levels	Initially, there would be an annual income loss to ranchers of $148,000. Forage increases would reduce this loss to $93,000 after 10 years and $67,000 after 15 years.	45% more available AUMs would equal a net income gain of $680,000 annually to ranchers 20 years or more after implementation. Increased aquatic and wildlife habitat productivity. The potential for soil erosion loss would decrease by 7%.	None	Slight short-term topsoil displacement caused by project development. Potential for 14 livestock operators not remaining in business in their present form
Alternative #5 Maximize Livestock Use	Livestock use would increase slightly to the current active preference level.	Net income gain to ranchers of $602,000 annually. Continued overobligation of vegetation on 40 allotments. Decreased aquatic and wildlife habitat productivity and decreased fishing and hunting opportunities. The potential for soil erosion loss would decrease area-wide by 6%.	None	Potential damage to undiscovered cultural resources. Possible loss of some habitat for bighorn sheep. Possible loss of redband trout fishery in streams with marginal trout habitats. Slight short-term topsoil displacement caused by project development.

CONSULTATION AND COORDINATION

During the preparation of the draft EIS, the team members were individually in contact with other federal offices, state and local agency representatives, interest groups and individuals. Communications varied from written comment to informal personal contact.

An existing group of interested Owyhee County citizens called the Owyhee Multiple Use Committee has been meeting since 1975. A group was formed in 1979 by the Owyhee cattlemen and called the Owyhee Action Committee. The resource area staff and members of the EIS team have made a concerted effort to work closely with these committees during the MFP and EIS preparation. Membership on the multiple use-oriented committee ranges from interests in recreation, wildlife, livestock, rangeland ecology, archaeological and historic values, and others. The district staff has also worked very closely with the Owyhee Cattlemen's Association during the EIS preparation.

A news release discussing the upcoming grazing environmental impact statement was sent to the news media on August 17, 1979. The official announcement to prepare the draft statement went to the Federal Register on August 30, 1979, followed on September 14, 1979, by a news release. The releases went to 75 newspapers, TV and radio stations in southwestern Idaho, and to the wire services.

On September 14, 1979, a letter went to 275 public land users interested in the livestock grazing program in Owyhee County. The letter announced open house scoping meetings for the draft EIS which were held in Boise on September 24 and 25, 1979. The letter included the tentative proposed action and a map of the area involved.

The draft EIS will be made available to the following groups, individuals and agencies for review and comment.

State Agencies

Attorney General
Office of the Governor (Idaho)
State of Oregon Clearinghouse
Idaho State Clearinghouse*
Fish and Game Department
Department of Health and Welfare, Division of Environment
Department of Transportation, Office of Environmental & Corridor Planning
Department of Lands
University of Idaho Cooperative Extension Service
Department of Water Resources
State Historical Society
Department of Agriculture
Department of Parks and Recreation
State of Idaho Historic Preservation Office
Idaho Fish and Game Commission
State Legislators

*This office will distribute EIS's to other state agencies

Federal Agencies

Department of Agriculture
USDA - Science and Education Administration
Soil Conservation Service - Boise, Marsing, Grandview, and Washington, D.C.
Environmental Protection Agency - Seattle and Boise
Department of Interior
Fish and Wildlife Service
Water and Power Resources Service (Bureau of Reclamation)
Geological Survey
Bureau of Mines
National Park Service
Secretaries Representative, Northwest
Heritage Conservation and Recreation Service
National Resources Library
Federal Power Administration
Advisory Council on Historic Preservation
Department of Commerce - Washington, D.C.

Congressional Representatives

Senator Frank Church
Senator James McClure
Representative George Hansen
Representative Steve Symms

Local Government

Owyhee County Commissioners
Owyhee County Planning and Zoning Commission
Malheur County Commissioners, Oregon
Owyhee County Sheriff's Office
Owyhee County Historic Preservation Office
Homedale Chamber of Commerce

Livestock Interests

Idaho Cattlemen's Association
Idaho Woolgorwer's Association
Owyhee Cattlemen's Association
Malheur Cattlemen's Association
Boise District Grazing Advisory Board Members
Owyhee Cattlemen EIS Action Committee

Conservation Organizations

Sierra Club
Ada County Fish and Game League
Idaho Wildlife Federation
Natural Resources Defense Council
Wilderness Society
Friends of the Earth
Idaho Environmental Council
Idaho Conservation League

Audubon Society
The Nature Conservancy
Nampa Rod and Gun Club
Oregon High Desert Study Group
League of Women Voters
American Association of University Women
Snake River Regional Studies Center
Citizens Alliance
Marsing Rod and Gun Club

Other Organizations

Southwest Idaho Development Association
WETA of Idaho
Owyhee County Historical Society
University of Idaho - Range and Forestry Department
Washington State University - Range and Forestry Department
Colorado State University - Range Department
College of Idaho
Idaho State University
Boise State University
Idaho Humane Society
WHOA
Carey Act Association of Idaho
Association of Idaho Cities
Idaho Water Users Association
Idaho Mining Association
Society for Range Management
Owyhee County Soil Conservation District
Idaho Motorcycle Association
Idaho Farm Bureau Federation
Idaho Gem Club
American Horse Protection Association
Boise District Multiple Use Advisory Board
Southwest Idaho Desert Racing Association
Owyhee County Cooperative Extension Service
Gem State 4 X 4 Club
International Society for the Protection of Horses and Burros

Individuals

All livestock operators in the Owyhee Resource Area
Joe Thackaberry
Lyle Talbot
Robert Skinner
Russell W. Heughins
Clarence Orton, Jr.
Lee Sharp
Dave Tishwell
Darrel Charlton
Marjorie Hayes
Wes and Wendy Downs
John Salove
Paul Friesewa
Kenneth M. Goldsmith

APPENDICES

APPENDIX A

Evolution of the Proposed Action through the Bureau's Planning System

The following describes how the proposed action evolved and integrates into overall planning for the EIS area.

Bureau Planning System

The Bureau of Land Management's land-use planning documents for the Owyhee EIS area were updated during 1977-1979 in accordance with BLM Manuals 1601-1608. These documents and other background data may be reviewed at the Boise, Idaho, BLM district office. Land use planning information relevant to the development of the proposed action is provided in the accompanying table.

Bureau resource management planning is accomplished in several stages, beginning with inventory of actual resources and ending with managerial decision documents. See Table A-1 for a tabular display of this process. An adversary concept is used for identifying various resource and land use conflicts; public input is encouraged and used. Final MFP III decisions for the Owyhee Planning Area may be influenced further by the outcome of this EIS.

Once general management objectives, constraints, and guidelines have been established in the MFP, a more detailed "activity plan" can be developed for a particular resource. The livestock grazing activity plan is called an Allotment Management Plan (AMP) since each allotment would ideally have a separate plan. When the Owyhee EIS is completed, the selected grazing systems will form the basis for a new or revised AMP for each allotment.

Appendix Table A-1

Planning System/EIS Interrelationship

Single-Use Recommendations (MFP-1) Livestock	Other MFP-1 Resource Management Recommendations Which Conflict	Multiple-Use Recommendations (MFP-2)	Rationale for the Multiple-Use Recommendations	Resource Trade-Offs
1. (RM 1.1) a. Intensively manage 70 allotments (955,065 acres of public land). b. Place 16 allotments under custodial management (34,018 acres of public land). c. Manage 58 allotments as Fenced Federal range (25,213 acres of public land).	1. Improve vegetation to good ecological condition to benefit wildlife & fisheries habitat & aesthetic values. Maintain wilderness character of Wilderness Inventory Units. Exclude all known cultural sites from livestock use.	1. Modify Step 1, part (a) to include allotment 0509 from part b & pasture 2 of allotment 600 from part c. Subsequent acreages would be as follows: intensive - 959, 277; custodial - 32,441; Fenced Federal - 22, 578. Areas identified as critical for multiple use management through the EAR process, will be segregated & management retained.	1. Intensive management is necessary to improve range condition & the administration of the range management program. Allotments containing small scattered parcels of public land will be managed less intensively unless resource values dictate otherwise. Allotment 0509 & pasture 2 of allotment 0600 will be managed to protect wildlife habitat values (critical deer winter range). Any area having high multiple- use values must be managed to enhance & protect these values.	1. Allotments managed as fenced federal range or custodial allotments are not expected to reach a good ecological condition as quickly as intensively managed areas. Also, areas managed as deferred rotation pastures are not expected to improve as rapidly as the rest-rotation pastures.
2. (RM 1.12) Prevent ORV use in all allotments while livestock are in the allotment. Restrict all ORV use to existing trails, and close all areas to ORV use in which this type of use is causing resource damage to occur.	2. Maintain and improve ORV opportunities on public land.	2. Close all early spring livestock ranges to recreational ORV use from April 1 through June 15, or until the livestock are moved from the spring use areas.	2. ORV use is detrimental to vegetation, & visual resource objectives. ORV use can cause uneven distribution of livestock & great disturbance to young calves. The multiple-use recommendation will mitigate recreational conflicts in the area used for early spring livestock grazing where the major conflicts currently exists.	2. Recreation use by ORV enthusiasts on the spring use areas will be eliminated. Disturbance of livestock on summer, fall, & winter use areas will continue.
3. (RM 2.1a) Graze all allotments at the maximum livestock carrying capacity of 82,817 AUMs. This figure reflects a 31% average reduction from active preference.	3. Allocate 2,152 AUMs of forage for wildlife (WL 1.1, 2.1, 4.1, 5.1). Allocate 2,329 AUMs of forage for wild horses (WL 3.2). Protect riparian habitat by managing for riparian habitat improvement to a good ecological condition.	3. Allocate 78,336 AUMs of forage to livestock, 2,152 AUMS to wildlife, & 2,329 AUMS to wild horses.	3. All forage is allocated to livestock in MFP Step 1. Sufficient forage must be allocated to achieve desired wildlife & wild horse populations. The active grazing preference of each allotment must be adjusted to balance forage consumption with forage production to realize an improvement in range condition.	3. The available livestock forage will be reduced by 4,481 AUMS which will be allocated to wildlife & wild horses.
4. (RM 2.2) Adjust the season-of-use to correspond to plant growth. Grazing may normally begin when leaf height reaches 4 - 6" on bluebunch wheatgrass, 2-5" on Idaho Fescue, 3-4" on squirreltail, & 1" on sandberg bluegrass (sheep ranges). Grazing use may be made 2 weeks prior to this growth stage if a supply of old forage is available.	4. Allocate forage to wildlife. Prohibit livestock use on critical deer winter ranges after Sept. 30 and whenever utilization of browse or grass exceeds 50%. Improve fisheries habitat from poor to excellent condition by prohibiting livestock use of riparian habitat during summers. Prevent livestock use during excessively wet soil conditions.	4. Use to be made in accordance with season-of-use criteria in Step 1 recommendation. Utilization to be limited to 50% of key species with plots established on key use sites.	4. Forage competition is unlikely between mule deer & cattle where proper stocking levels, proper utilization & intensive management practices have been implemented. Intensive management will mitigate the impacts of grazing on riparian vegetation during the summer & improve the summer diet for livestock & mule deer. The seasons-of-use identified are based on the vegetation type, plant growth, elevation & climate found within each allotment & must be allowed to stabilize the livestock industry. A season-of-use based upon the development stage of key perennial plants is necessary to improve range condition. Flexibility must be allowed as plant growth varies from year to year, depending upon	4. Use made after August will normally include utilization of browse plants. This affects the amount of winter forage available for big game. Use made prior to seed ripe depletes the plant's ability to maximize growth & reprehensive functions.

Appendix Table A-1 cont.

Single-Use Recommendations (MFP-1) Livestock	Other MFP-1 Resource Management Recommendations Which Conflict	Multiple-Use Recommendations (MFP-2)	Rationale for the Multiple-Use Recommendations	Resource Trade-Offs
			4. (cont.) climatic conditions & the type of grazing systems implemented.	
5. (RM 2.4) Initiate and/or continue intensive grazing management on 72 allotments comprising some 961,062 acres of public land by developing 63 AMPs. Continue the present intensive grazing management on the Reynolds Creek #0508 & Blackstock Springs #0515 allotments.	5. Manage allotments with deer winter range to protect & improve wildlife habitat & maximize wildlife forage (WL 2.3). Implement livestock grazing systems & practices that will allow dense upland & riparian cover to form on all waterfowl nesting areas (WL 8.1). Improve fisheries habitat from poor to excellent condition by excluding livestock grazing for 5 to 7 years on riparian areas along 120 miles of stream (WL-Aq 2.1).	5. Same as MFP 1 as modified below: Limit season-of-use on all critical mule deer winter ranges to 9/30 of each year or 50% utilization on key grass or browse species, whichever occurs first. Change the proposed management on allotments in deer winter range (#'s 0507, 0519, 0541, 0552, 0553, 0603, 0563, 0562, 0521, 0574, 0588, 0517, 0521 & 0595) to maximize wildlife habitat improvement & forage production. Manage allotments #0572, 0597, 0515, 0539, 0556, 0565, 0542, 0557, 0529, 0516, 0593, 0569, 0573, 0501 & 0597 as proposed, but monitor closely and if adverse impacts occur, modify the system as needed. Fence all major reservoirs with a year long water supply & all spring developments in riparian zones. In addition, fence 64 stream miles, as identified in WL-Aq 2.1, to improve & protect fishery habitat. Where possible the small pastures created by this fencing will be incorporated into a grazing system & the system proposed in RM 2.4 adjusted. Where a fair with upward trend can be achieved on the riparian zone within a five year period & improved to a good condition in ten years by the grazing system, no riparian zone fencing will be done on the remaining 49 stream miles identified in WL-Aq 2.1.	5. Management on allotments with critical deer winter range was changed to recognize & protect wildlife habitat requirements, livestock forage production, & achieve the best mix for both resources. Season-of-use dates that extend beyond 8/31 may not result in proper shrub management on the critical deer winter ranges. Greater than 50% utilization of shrubs by livestock would be detrimental to deer forage supplies & to growth & reproduction of the shrub species, & must therefore be monitored closely. The grazing systems & seasons shown in Step 1 for allotments No. 0572, 0597, 0515, 0539, 0556, 0565, 0542, 0557, 0529, 0516, 0593, 0569, 0573, 0501 & 0597 have not been modified to take into account the specific shrub needs of wintering mule deer. Although these systems are not designed to reduce utiliation on all forage species, to maintain & improve plant vigor of the present forbs & shrub component, to increase grass cover & composition, & to improve the present plant vigor of all forage species. These allotments will be closely monitored to document impacts to wildlife habitat, & if adverse, the seasons and/or systems will be changed to better manage the shrub component. MFP Step 1 was not changed to reflect the systems to be developed for riparian habitat protection (WL-Aq 2.1) as (1) funding is not available to construct riparian protection fences on all the stream miles proposed, (2) some of the systems proposed are expected to improve stream & riparian areas as needed, (3) & current literature reveals that an analysis of the effects of various grazing systems on riparian & stream habitat is needed & may be obtained from the streams which are proposed to be fenced.	5. The revised management will, on some allotments, result in additional fencing. However, these revisions will result in achievement of the best multiple use mix possible for livestock, wildlife & plant management. Flexibility will be reduced on all allotments within the critical deer winter range & completely lost on those allotments changed to a particular season. Forage production for maximizing livestock use cannot be met & neither can production to maximize shrub needs for wildlife. Stream fencing will result in soil damage along fences & possible damage from overuse from break ins. A short term production of livestock forage will be lost when riparian areas are deferred or rested. The good riparian habitat condition will not be achieved as rapidly as desired. The ecological site improvement on the allotments with no change made in the grazing system will be slower than desired.

Appendix Table A-1 cont.

Single-Use Recommendations (MFP-1) Livestock	Other MFP-1 Resource Management Recommendations Which Conflict	Multiple-Use Recommendations (MFP-2)	Rationale for the Multiple-Use Recommendations	Resource Trade-Offs
6. (RM 2.5) Control sagebrush & juniper invasion on 154,000 acres. Control brush & artifically seed 198,000 acres following brush & Juniper control. Use a grass/forb/shrub seed mixture on all mechanical revegetation projects. Brush & juniper control will be accomplished through controlled burning, chemical means, & chaining. Allotments which are not expected to improve to a good condition class through management alone & allotments managed for spring use will receive high priority for land treatment projects.	6. Manage visual & cultural resources to prevent their degradation. Maintain wilderness character in inventory units or WSA's. Manage and/or improve vegetative composition to provide proper food-cover mix for wildlife (WL 4.3, 7.6). Maintain raptor hunting areas (WL 9.1) & habitat for long-billed curlew & western ground snake (WL 9.9).	6. Control sagebrush & juniper invasion on 172,000 acres. Control brush & artificially seed 67,000 acres. All treatment projects will be limited in size where necessary, by the cover to forage ratio requirement of wildlife on a specific wildlife range (i.e. A 40% cover to 60% forage ratio is required on deer ranges). A buffer zone along all creeks where erosion may occur will be left undisturbed to protect riparian zones & fisheries habitat. Projects will be designed with irregular control lines, feathered edges & natural contours. Drainages & occasional brush islands will be left untreated on sites treated by mechanical means. These areas may be seeded if artifical revegetation follows the brush control treatment. The priority for land treatment projects is the same as Step 1. A grass/forb/shrub seed mixture shall be used on all mechanical revegetation projects. Specific projects will be cancelled if serious resource damage can not be mitigated.	6. The combination of land treatment & intensive management systems is the most logical means of reaching the desired overall good range condition class. This combination is also the most logical method of maximizing forage production for livestock. Land treatments on the desirable sites will reduce grazing pressure on the sites slower to respond. This reduction of pressure as a result of land treatment magnifies the response of the intensive management system. A grass/forb/shrub mixture will allow flexibility in season of use due to differences in plant phenology, palatability, & protein percent. The areas managed for spring use should be developed to their maximum to produce sufficient amounts of early spring feed to 1) allow ranch operators to move their cattle off cultivated fields & hay meadows, and 2) keep livestock off summer use areas until the key forage plants are ready for grazing.	6. A reduction of 131,000 acres in artifical seeding will occur. However, an increase in brush control of 18,000 acres will also result for a total net reduction of 113,000 acres of vegetative manipulation. This net reduction means an increase in the time required to reach a good ecological condition & a net annual loss of 29,800 livestock AUMs for this period of time. Beneficial impacts will occur as a result of developing & maintaining proper food/cover ratios & critical winter, nesting & rearing habitat for all wildlife species. Additional wildlife forage will also be developed.
7. (RM 2.8) Develop livestock management facilities needed for AMP and/or grazing system implementation as follows: 153 miles of fence 81 spring developments 24 miles of pipeline 100 troughs 90 reservoirs and/or pits Cattleguards will be installed on all major access roads.	7. Manage & maintain wildlife migration routes (WL 2.10). Maintain separation of livestock & bighorn sheep (WL 5.3, 5.5). Limit livestock concentrations in riparian habitat (WL 10.2). Avoid disturbance activities within 2 miles of sage grouse strutting grounds. Protect, maintain & enhance visual resource values (R 2.1). Manage WSA's to maintain their wilderness characteristics. Protect cultural resource values.	7. Accept Step 1 recommendations with the following stipulations: a. No construction of new roads & water developments within bighorn sheep habitat b. Enhance upland game habitat in conjunction with livestock water development. Wildlife installations to be maintained by BLM. c. No construction activity from March thru May within 2 miles of strutting grounds. d. Fence new & existing reservoirs & spring developments to accommodate waterfowl habitat. Develop stock water outside the enclosure when feasible. Install water line valves to prevent constant drainage at the spring e. Reservoirs should not be constructed within, or in a manner which will dry up riparian zones. f. Construct all management facilities to mitigate adverse impacts to wildlife, cultural & visual resources, & be within WSA guidelines.	7. These management facilities are needed in order to implement many of the proposed grazing systems. BLM's objective to improve vegetative condition to a good ecological rating within 20 years & to maintain the stability of the livestock industry cannot be reached without construction of the proposed facilities. The stipulation in Step 2 will mitigate the major adverse impacts expected from the construction of livestock management facilities.	7. Riparian areas adjacent to springs & reservoirs will be fenced, excluding livestock grazing & a loss of potential forage for livestock use. Livestock use in bighorn sheep range will be restricted by the limiting of livestock water developments New fences will still be a hazard, although reduced, to big game animals, even though fences will be constructed to BLM specifications. Visual & cultural resources will be impacted to some extent.

Single-Use Recommendations (MFP-1) Livestock	Other MFP-1 Resource Management Recommendations Which Conflict	Multiple-Use Recommendations (MFP-2)	Rationale for the Multiple-Use Recommendations	Resource Trade-Offs
8. (WL-Aq 2.1) Improve on-site fisheries habitat from poor to excellent condition on 113 stream miles by excluding livestock grazing for 5 to 7 years on ripsrian areas adjacent to the subject streams. After the exclusion period, implement intensive livestock management practices that will maintain excellent habitat condition standards. These practices should contsin combinations of the following: a. change the present grazing system in ripsrian areas with separate pastures for ripsrian areas to allow management of these pastures with emphasis on maintaining excellent habitat condition for fisheries. b. reduce livestock stocking rates in riparian pastures. c. limit the season of livestock use to spring, fall, or winter use only. d. fence or partially fence riparian areas or livestock access points to riparian areas. e. redistribute cattle away from riparian areas through use of raised log structures placed perpendicular to the stream & close enough together to discourage use of ripsrian area between the log structures, require the placement of salt away from riparian areas through license stipulations, & increase water developments away from streams.	8. Allocate forage to livestock on all areas suitable for grazing. Implement intensive grazing rotation systems.	8. Initially fence 64 stream miles to improve on-site fisheries habitat from poor to good conditions. Intensively manage livestock for a period of time necessary to improve riparian habitat factors. Habitat factors impacted by grazing include streambsnk cover & stability, stream channel stability, sedimentation, & in-stream cover. Standards for good habitat condition are listed in MFP Step 2 Recommendation WL-Aq 2.1. Once habitat factors show an upward trend & if a fair condition is obtained within 5 years, then livestock use may be made as long as an upward trend is maintained & a good fisheries habitat condition is achieved. Livestock management practices could include methods a, b, c, & e of the MFP-1 recommendation. Where fencing is implemented, provisions for livestock water gaps will be evalusted on a case by case basis. The remaining 49 stream miles identified in Step 1 will not be fenced but will be managed in conjunction with livestock grazing where livestock management methods identified in "b" & "e" of Step 1 will be implemented.	8. Livestock grazing is one of the major contributing factors for the poor fishery habitat condition found in the E.S. area. There have been no grazing systems or intensive livestock management programs which have been developed & documented to meet the good habitat condition standards for fisheries to date outside of exclusion (by fencing) of livestock from riparian areas. Obtainment of good riparian condition would reduce downstream silt loads & benefit most wildlife species, watershed stabilization of riparian areas, sightseeing, hunting, fishing, & protection of cultural resource values. Some streams will not be fenced because: a. only a small portion of the steam is on public land b. these streams do not have red-band trout populations or other game fish, c. these streams did not with improvement offer as much potential as other stream areas for recreational fishery, d. fencing would be impractical. Finally, attainment of excellent fisheries habitat conditions was replaced with good habitat condition to mitigate adverse impacts on livestock management.	8. The riparian habitat will be improved to a good condition class rather than an excellent condition class. Miles of stream to be fenced will be reduced from 113 to 64. There would be a high negative impact on range management in stream areas which would be partially fenced by method "d" as outlined in MFP-1. If areas were fenced this would result in a loss of forage in the enclosed area available to livestock & also would adversely impact proposed livestock movement patterns. Initial fencing costs would be about $2,000/mile & would require fence maintenance costs thereafter. If method "a" proposed in MFP-1 is implemented this would be in conflict with proposed livestock grazing systems (RM 2.4). The long term impact to livestock forage would be beneficial due to increased production.
9. (WL-Aq 2.2) Improve fisheries habitat condition from fair to excellent condition through intensive livestock management on riparian areas of 32.35 stream miles in the E.S. area. Intensive livestock management should be applied with goals directed at insuring that riparian areas receive no more than light livestock use to maintain excellent habitat condition standards. Intensive livestock management on riparian areas to minimize damage to fisheries should contain combinations of the practices identified in #8 above.	9. Allocate forage to livestock on all areas suitable for grazing. Implement intensive grazing rotation systems.	9. The 32.35 stream miles will be managed utilizing methods "b" & "e" as outlined in MFP-1 in conjunction with livestock grazing in riparian areas. These methods include reduction of livestock stocking rates & methods to redistribute livestock away from stream areas especially through the use of log structures placed perpendicular to the stream to break up cattle trailing along the stream.	9. Livestock grazing is one of the major conflicts to fisheries in the E.S. area. Loss of riparian vegetation adversely affects many of the other habitat features which are important fisheries habitat features which provide good overall production & stability in a stream. Fisheries habitat condition of streams listed in this recommendation is fair. It has been shown that generally riparian areas receive very high livestock use rates. However, use of these stream areas by livestock is considerably less than other stream areas listed in poor condition throughout the E.S. area. The intensive livestock management factors to minimize fisheries habitat damage (outside of total fencing) were based on inventory information collected on riparian areas. The riparian areas proposed in this recommendation MFP-1 are in fair condition already. It may be possible to improve habitat condition by the use of methods "b" & "e" since these areas are not presently receiving as much livestock grazing pressure as those outlined in recommendation 2.1 which are in poor condition. Fencing costs & maintenance costs are also high ($2,000/mile of fencing for initial construction) & a sizeable portion of other stream areas in worse condition than these are already slated for fencing.	9. Since there will be no fencing implemented in this recommendation, high negative impacts to range management recommendations (concerning use of forage for livestock which includes riparian areas & proposed grazing systems for the ORA) will be mitigated to low negative or neutral impact. The use of log structures placed perpendicular to streams to break up cattle trailing along streams may result in a very small amount of forage production unavailable to livestock in areas between the log structures. The stock will no longer be able to trail along the creeks, thus making stock movement more difficult. With no fencing of these riparian areas & use of methods "b" & "e" as outlined in MFP-1, fisheries habitat condition may improve to at best, high fair condition. If methods "b" & "e" are not effective in conjunction with the grazing systems & seasons of use implemented on stream areas, fisheries habitat condition will remain in low fair condition or degrade to poor condition. High benefits to Wildlife, Watershed, Recreation & Cultural Resources will be lessened to low benefits provided that methods "b" & "e" are effective at improving streamside habitat condition.

APPENDIX B
Grazing Allotment Key

Allot. No.	Allotment Name	Allot. No.	Allotment Name
	Intensive Management		
450	Swisher Springs	549	Ben - Mills Flat
500	Whitehorse	550	Star Ranch Field
501	Cliffs	551	Sheep Hills
502	Louisa Creek	552	Glass Creek
503	Flint Creek - Deer Creek	553	Robert Gluch Individual
505	Morgan Individual	554	Gusman Individual
506	McBride - Jackson	556	Shares Basin
507	Palmer	557	Madariaga
508	Reynolds Creek	562	Cow Creek Individual
509	Boulder Flat	563	Trout Creek Individual
513	Elephant Butte	565	Rockville
514	Alkali - Wildcat	568	Graveyard Point
515	Blackstock Springs	569	Oreana #2 & #3
516	River Group	570	Jump Creek
517	Black Mountain	571	Oreana #1
518	French John	572	McDaniel Individual
519	Strodes Basin	573	Hardiman Springs
521	Sands Basin	574	West Antelope
522	Rats Nest	578	Fossil Butte
525	Juniper Springs	579	Oreana Individual
526	Boulder Flat	580	Louse Creek
529	Trout Creek Individual	581	Duck Creek - Wash Gulch
530	Trout Creek Individual	585	Brown's Creek
531	Joint Allotment	587	Lone Tree Individual
532	Oreana #5	588	Oreana Individual
533	North Castle	589	Boone Peak - Bates Creek
534	Box "T"	590	Bridge Creek
535	Fossil Butte	593	Crutcher Crossing
536	South Dougal	595	Combination Creek
539	Trout Springs	597	Wroten Individual
540	Bull Basin	599	Burghardt Individual
541	Whitehorse - Antelope	600	South Mountain Individual
542	Cherry Creek Field	601	Louisa Creek
546	Pleasant Valley	602	West Antelope
548	Battleground Boni	603	Poison Creek
	Less Intensive Management		
510	Pole Bridge	576	South Mountain Individual
520	Indian Meadows	586	Tippin Homestead
544	Feltwell Individual	591	South Mtn. Grazing Coop.
558	Franconi	592	Trout Creek Individual
559	Sheep Creek Individual	594	Tyson Hardiman Springs
560	Trout Creek - Lequerica	596	Lone Tree Individual
561	South Mountain Area	598	Whitehorse Oregon - Idaho
564	Old Man		

Allot. No.	Allotment Name	Allot. No.	Allotment Name
	Management with Private Lands		
453	Hanley F.F.R.	515-3	Blackstock Springs F.F.R.
454	Anderson F.F.R.	523	Chipmunk Field
455	Payne F.F.R.	537	Dougal Individual
456	Dougal F.F.R.	543	Stanford Individual
457	McKay F.F.R.	545	Ferris Individual
458	Josephine F.F.R.	555	Hazen Individual
459	Brown F.F.R.	566	Maher F.F.R.
461	Munro F.F.R.	567	Maher, Wm. Individual
463	Pleasant Valley F.F.R.	575	Miller F.F.R. Individual
464	Cow Creek F.F.R.	577	Bogus Creek
465	Quintana F.F.R.	582	Trout Creek
466	Thomas - Gluch F.F.R.	606	Harris Individual
467	Gusman F.F.R.	607	Baltzor F.F.R.
469	McDaniels F.F.R.	608	Stanford F.F.R.
470	M. Stanford F.F.R.	609	Berrett F.F.R.
471	Jack - McBride F.F.R.	610	Stapler F.F.R.
472	Jackson - McBride F.F.R.	611	T. Payne F.F.R.
473	Lequerica F.F.R.	612	R. Collins F.F.R.
476	Bush Ranch F.F.R.	613	Steiner F.F.R.
477	Lowery F.F.R.	616	Tyson F.F.R.
479	No Name F.F.R.	618	Johnstone F.F.R.
483	Salove F.F.R.	619	Nettleton F.F.R.
485	Reynolds Creek F.F.R	620	Bass F.F.R.
486	Murphy F.F.R.	621	Mason F.F.R.
487	Joyce F.F.R.	623	Bull Basin F.F.R.
491	Granny Box "T"	624	Jaca F.F.R.
492	D. Bass F.F.R.	625	Burghardt F.F.R.
504	Bahem Individual	626	Nahas F.F.R.
511	Little Boulder F.F.R.	627	So. Mountain. Ind. F.F.R.

APPENDIX B
Livestock Operator Key

Permitee Name	Allotment
Anderson	500
	501
	454
Bahem	503
	504
Baltzor	506
	607
Bass, H.	508
	492
Bass, L.	508
	492
Bennett	507
Berrett	509
	510
	511
	609
Blackstock	513
	514
	515
Boston	508
Brandau, H.	516
	517
Brandau, R.	516
	517
Brown	519
	520
	459
Bruce	520
	565
	603
	605
	610
Burgess	572
	469

Permittee Name	Allotment
Burghardt	599
	625
Callaway	627
Chipmunk Grazing Association	506
	513
	514
	515
	516
	517
	521
	522
	523
	570
	472
Collins, J & R	529
	612
Collins, W.	530
Cox	532
	533
	534
	535
	491
C.T. Ranch	508
	517
	616
Curtis	516
Dougal, B & C	500
	537
Dougal, C.	500
	536
	456
Eiguren, Mendieta & Potter	539
Elordi	506
	570

Permittee Name	Allotment
Evans	517
	570
	571
	619
Feltwell	544
	467
Ferris	531
	545
Gammett	565
Gardner	506
	566
Glenns Ferry Grazing Assn.	548
	549
	550
	551
Gluch, R.	552
Gluch, T.	553
	466
Gusman	554
Hanley	500
	531
	539
	453
Harris	606
Hawks	555
Hayland Ranches	541
Heath	518
	556
Jaca	508
	517
	570
	624

Livestock Operator Key (continued)

Permittee Name	Allotment
Johnston C.	516
	517
Johnstone A.	515
	519
	520
	603
	618
Josephine Cr.	587
	458
Joyce Livestock Company	535
	569
	571
	487
Kershner	502
	503
Larrusea	559
Lequerica	560
	561
	473
L.S. Cattle Co. Jeff Stanford	506
	608
L.S. Cattle Co. Jerry Stanford	531
	557
	558
L.U. Ranching	561
	562
	563
	477
Mackenzie	520
	564
Maher	567
Malmberg	516
Markley	565
	568

Permittee Name	Allotment
Mason	621
	508
McKay	500
	501
	457
McKee	508
McMahon	516
	517
Miller	535
	573
	574
	575
Morgan	505
	576
	577
Munro	573
	585
	586
	461
Nahas	535
	541
	578
	579
	626
Nettleton	569
Palmer	565
Panzer	503
	561
	580
	581
	582
Payne, Payne & Hanley	546
Payne, P.	500
	539
	455

Permittee Name	Allotment
Payne, T.	500
	539
	611
Pershall	513
	600
	627
Potter	539
Quintana	503
	514
	518
	520
	521
	526
	565
	603
	465
Ross	540
	623
Shenk	521
	525
	476
Sinker Cr. Ranch	588
	594
	595
South Mountain Grazing Coop.	591
	598
Spring Valley	506
	513
	514
	518
	519
	521
	525
	565
	603
Stahle	588
	589
	590
	483

Livestock Operator Key (continued)

Permittee Name	Allotment	Permittee Name	Allotment	Permittee Name	Allotment
Stanford Company	539	Steiner	535	Walker	518
	592		601		556
			602		
Stanford, M.	500		613	Warn	552
	501				596
	539	Swisher	593		
	542		450	Wroten	597
	543				
	470				

Appendix C
Forage Allocation Methodology

To make a more equitable apportionment of forage between the grazing animals, it is desirable to separate the animal preference for each plant species with the degree to which the plant can withstand grazing (or herbage removal) and still maintain itself in a viable, healthy condition. The amount of use depends upon its stage in phenological development. It is also influenced by the amount of precipitation it receives after grazing.

Plant Use Factors

A use factor was applied to the production of each plant species to arrive at the total pounds of herbage that can be removed by grazing animals without affecting the viability of the plant. The herbage that can be removed by the grazing animal is designated as usable forage.

A use factor was not applied to unpalatable plants. Unpalatable plants are those not grazed by any ungulate except under heavy use. However, a use factor was applied to a particular plant species even though it is palatable to only one animal species.

A review of the literature shows that most grass species will, depending upon the time of year, tolerate herbage removal of up to 50 percent of its annual production by weight. The literature does not contain much information on proper utilization of forbs and shrubs.

The following table shows use factors by plant class for perennial and annual species for the appropriate management category.

Table C-1
Percent Allocated Forage Using Proper Use Limits

Management Category	Vegetation Class	Season-of-Use			
		Spring	Summer	Fall	Winter
Intensive 1/					
	Grass	50%	50%	50%	50%
	Forbs	50%	50%	50%	50%
	Shrubs	50%	50%	50%	50%
Less Intensive/Management with Private 2/					
	Grass	30%	40%	50%	50%
	Forbs	25%	25%	25%	25%
	Shrubs	30%	30%	30%	30%
	AgCR 3/	40%	60%	60%	60%
	POSA 3/	50%	20%	0%	0
	BRTE 3/	50%	20%	30%	30%

1/ Alternative 4 used 60 percent instead of 50 percent.
2/ These use factors were also used for the intensive management category for Alternative 3.
3/ Exceptions to the use limit established for grasses.

Use factors are lower in the spring and early summer for two reasons: (1) defoliation of the plant anytime during the growing period is harmful to the plant and (2) production figures are based on mature weights and plants have actually produced only a portion of their total production during this period.

The palatable annuals such as cheatgrass were given a use factor of 50 percent in any allotment with spring use, which is during the specie's peak growing season. During other periods, its use factor was lower because a higher use factor would cause over utilization of desirable perennial species.

Animal Diets

Data from various sources used fecal analysis to determine the animal preference or dietary requirements. The following table reflects the diet composition on a properly grazed range for various ungulates.

Table C-2
Diet Composition of Certain
Ungulates in Percent

	Spring			Summer			Fall & Winter		
	Grass	Forb	Shrub	Grass	Forb	Shrub	Grass	Forb	Shrub
Cattle	90	3	7	90	3	7	86	0	14
Horses	78	14	8	78	14	8	78	14	8
Mule Deer	35	24	41	5	50	45	8	22	70
Antelope	22	27	51	5	40	55	5	5	90
Bighorn Sheep	89	5	6	80	15	5	69	11	20
Domestic Sheep	35	37	28	35	37	28	24	1	75

Table C-3 shows the pounds of forage consumed per month (30 day period) by the various ungulates.

Table C-3

	Pounds of Forage Consumed per months
Cattle	800
Horses	1,000
Mule Deer	130
Antelope	85
Bighorn Sheep	128
Domestic Sheep	162

Therefore, the pounds of forage consumed per month by each animal based on dietary composition and for each season-of-use is shown in Table C-4.

Table C-4
Pounds of Forage Consumed by Certain Ungulates

	Spring			Summer			Fall & Winter		
	Grass	Forb	Shrub	Grass	Forb	Shrub	Grass	Forb	Shrub
Cattle	720	24	56	720	24	56	688	0	112
Horses	780	140	80	780	140	80	780	140	80
Mule Deer	46	31	53	7	65	58	10	29	91
Antelope	19	23	43	4	34	47	4	4	77
Bighorn Sheep	114	6	8	102	19	7	88	14	26
Domestic Sheep	57	60	45	57	60	45	39	2	121

Forage Production Determination

Since allotments are grazed during different seasons or portions of different seasons, seasonal dates were established.

Spring - March 1 through June 15
Summer - June 16 through August 31
Fall-Winter - September 1 through February 28

To determine the amount of forage available for allocation, ecological sites were stratafied by condition class. The total herbage production for each individual soil mapping unit was calculated using percent composition of each ecological site by condition class within that particular soil mapping unit. This percent composition was determined from a third order soil survey (see data analysis section in Appendix F). The per acre production of vegetation within each mapping unit was then multiplied by the percent of the proper use limits for each plant species within a vegetative class (shown in the proper use limits Table C-1). The following table shows how the amount of usable forage per acre is determined by season (spring, summer, fall and winter) for each mapping unit by condition class. This example depicts the useable forage calculations for the intensive management category of Alternative 3.

Table C-5
Per Acre Usable Forage by Season for Mapping Unit 24
in Poor Condition

		--- Spring ---		--- Summer ---		-Fall-Winter-	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Species[1/]	Total Production Per Acre (air dry)	Use Factor	Pounds Forage (1x2)	Use Factor	Pounds Forage (1x4)	Use Factor	Pounds Forage (1x6)
Grass							
FEID	9.4	.30	2.80	.40	3.76	.50	4.70
AGSP	11.3	.30	3.39	.40	4.52	.50	5.65
POSA3	11.9	.50	5.95	.20	2.38	.00	0.00
SIHY	18.9	.30	5.67	.40	7.56	.50	9.45
BRTE	9.0	.50	4.50	.20	1.80	.30	2.70
Sub Total	60.1		22.31		20.02		22.50

Table C-5 (continued)

Species[1/]	(1) Total Production Per Acre (air dry)	--- Spring --- (2) Use Factor	(3) Pounds Forage (1x2)	--- Summer --- (4) Use Factor	(5) Pounds Forage (1x4)	-Fall-Winter- (6) Use Factor	(7) Pounds Forage (1x6)
Forbs							
LUPIN	11.2	.25	2.80	.25	2.80	.25	2.80
PHHO	35.6	.25	8.90	.25	8.90	.25	8.90
Sub Total	46.8		11.70		11.70		11.70
Shrubs							
ARTRT	37.8	.00	0.00	.00	0.00	.00	0.00
ARAR8	360.3	.30	108.09	.30	108.09	.30	108.09
ARTRV	133.5	.30	40.05	.30	40.05	.30	40.05
Sub Total	531.6		148.14		148.14		148.14
GRAND TOTAL	638.5		182.15		179.86		182.34

1/ Plant abbreviations from SCS, Idaho Plant List.

The useable forage per acre by vegetative class is then multiplied by the associated acres of a perticular mapping unit within an allotment. The calculations of the allowable forage production determinations and annual allocations were completed for the EIS area using automated data processing (ADP). The following is an example of the usable forage by mapping unit and the total available forage on the Red Canyon allotment.

Table C-6
Pounds of Allowable Forage by Season

Map Unit	Acres	Spring Grass	Summer Grass	Fall-Winter Grass	SP-SU-FW Forbs	SP-SU-FW Shrubs
24P	626.0	13966.	12533.	14085.	7324.	92736.
24F	104.0	6773.	7045.	8048.	2864.	9344.
24AP	686.6	15319.	13663.	15319.	8004.	101435.
37P	27.0	716.	570.	651.	434.	4401.
TOTAL	1443.6	36774.	33811.	38103.	18626.	207916.

The palatable vegetation is used by livestock and wildlife; however, livestock are not allocated vegetation in unsuitable areas, whereas wildlife are. Therefore, in order to avoid over-allocation of vegetation to wildlife, their vegetal requirements (by class) were determined only on the suitable livestock range prior to the allocation process. Hence all wildlife forage requirements used were competitive with livestock.

Allocation Example

The maximum number of animals that can be grazed on this area is determined by dividing the pounds of forage produced by class of plant by the pounds of forage required per animal month for each season. The plant class which produces the least number of AUMs is then the factor limiting the number of animals that can be grazed on the allotment. The Red Canyon allotment is grazed by cattle, deer and antelope.

The following calculations are for spring use (3.5 months) only, and would also be calculated for the other two seasons of use.

Cattle

Grass	36,774 pounds ÷	720 pounds per cattle AUM =	51 cattle AUMs
Forbs	18,626 pounds ÷	24 pounds per cattle AUM =	776 cattle AUMs
Shrubs	207,916 pounds ÷	56 pounds per cattle AUM =	3,713 cattle AUMs

A maximum of fifteen cattle can graze in the spring period (51 AUMs ÷ 3.5 months = 15 animals).

The limiting factor for cattle in this case is the grass.

Deer

Grass	36,774 pounds ÷	46 pounds per deer AUM =	799 deer AUMs
Forbs	18,626 pounds ÷	31 pounds per deer AUM =	601 deer AUMs
Shrubs	207,916 pounds ÷	53 pounds per deer AUM =	3,923 deer AUMs

A maximum of 172 deer can graze for the 3.5 months of spring.

The limiting factor for deer is forbs in this case.

Antelope

Grass	36,774 pounds ÷	19 pounds per antelope AUM =	1,935 antelope AUMs
Forbs	18,626 pounds ÷	23 pounds per antelope AUM =	810 antelope AUMs
Shrub	207,912 pounds ÷	43 pounds per antelope AUM =	4,835 antelope AUMs

A maximum of 231 antelope can graze in the spring period.

The limiting factor for antelope, again, is forbs.

This method only maximizes AUMs within a single season and for a single kind of animal. The AUM figures for each species are not accumulative, they are only for that single season-of-use and kind of animal.

However, since more than one season is usually involved, a weighted dietary factor is used in determining the biological limit. The Red Canyon allotment is grazed by cattle from April 21 to September 15 21 weeks). Deer and antelope also use the area from May 1 through October 31 (13 weeks) and June 1 to August 31 (27 weeks) respectively. The weighted dietary requirement is determined by multiplying the forage consumed per animal in a month by vegetal class (see Table C-4) times the number of weeks in each season, divided by total weeks of that grazing period. This would be done for each of the grazing animals as follows:

Cattle (Spring = 8 weeks, Summer = 11 weeks, Fall-Winter = 2 weeks)

Grass	(720 x 8) + (720 x 11) + (688 x 2) ÷ 21 =	717
Forbs	(24 x 8) + (24 x 11) + (0 x 2) ÷ 21 =	22
Shrubs	(56 x 8) + (56 x 11) + (112 x 2) ÷ 21 =	61
		800 pounds/month

Antelope (spring = 2 weeks, Summer = 11 weeks)

Grass	(19 x 2) + (4 x 11) ÷ 13 =	6
Forbs	(23 x 2) + (34 x 11) ÷ 13 =	32
Shrubs	(43 x 2) + (47 x 11) ÷ 13 =	47
		85 pounds/month

Deer (Spring = 7 weeks, Summer = 11 weeks, Fall-Winter = 9 weeks)

Grass	(46 x 7) + (7 x 11) + (10 x 9) ÷ 27 =	18
Forbs	(31 x 7) + (65 x 11) + (29 x 9) ÷ 27 =	44
Shrubs	(53 x 7) + (58 x 11) + (91 x 9) ÷ 27 =	68
		130 pounds/month

The weighted biological limit is determined as follow:

Grass (36,774 x 8) + (33,811 x 11) + (38,103 x 2) ÷ 21 = 35,349

Since the biological limit for forbs (18,626 pounds) and shrubs (207,912 pounds) are the same for all seasons, weighting is not necessary.

A multiple use recommendation in MFP-2 would be to allocate forage for 50 deer, 30 antelope and the balance for cattle.

The 50 deer would require the following pounds of forage, from May 1 through October 31 (six months):

Grass	50 deer x 18 pounds/deer x 6 months =	5,400 pounds
Forbs	50 deer x 44 pounds/deer x 6 months =	13,200 pounds
Shrubs	50 deer x 68 pounds/deer x 6 months =	20,400 pounds

The 30 antelope would require the following pounds of forage, from June 1 through August 31 (four months):

Grass	30 antelope x 6 pounds/antelope x 4 months =	720 pounds
Forbs	30 antelope x 32 pounds/antelope x 4 months =	3,840 pounds
Shrubs	30 antelope x 47 pounds/antelope x 4 months =	5,640 pounds

The total pounds required by deer and antelope are:

	Grass	Forbs	Shrubs
Deer	5,400	13,200	20,400
Antelope	720	3,840	5,640
TOTAL	6,120	17,040	26,040

Once the wildlife forage requirements are figured, they are subtracted from the total available vegetation:

Grass	Forbs	Shrubs
35,349	18,626	207,912
6,120	17,040	26,040
29,229	1,586	181,872

The balance is available for cattle and their dietary requirements are used to figure AUMs.

Grass	29,229 pounds ÷	717 pounds per cattle AUM =	41 cattle AUMs
Forbs	1,586 pounds ÷	22 pounds per cattle AUM =	72 cattle AUMs
Shrubs	181,872 pounds ÷	61 pounds per cattle AUM =	2,982 cattle AUMs

Since grass provides the smallest number of AUMs for cattle it is the limiting factor and nine head of cattle can be grazed in the allotment from April 21 to September 15 (41 AUMs ÷ 4.8 months = 9 cattle).

To determine how many cattle AUMs wildlife would need within the allotment, take the total wildlife grass pounds and divide it by the 717 grass pounds of the cattle dietary requirements, since grass is the limiting factor for cattle in this allotment. This would result in nine cattle AUM requirement (6,120 grass pound for wildlife ÷ 717 grass pounds per cattle AUM = 9 wildlife competitive cattle AUMs) for wildlife or a loss of two cattle during the livestock grazing season.

Appendix Table C-7

Initial Vegetation Allocation
Proposed Action

	Pounds of Forage Allocated						Competitive AUM Allocation					
Allot. No.	Total Veg. Prod.	Livestock	Deer	Antelope	Wild Horses *Big Horn Sheep	Total (lb) Allocation	Wild-Life	Wild Horses	Live-Stock	Total Suitable AUMs	Un-Suitable AUMs	Total AUMs
Intensive Management												
450	1,887,447	238,400	48,731	--	---	287,131	10	--	298	308	---	308
500	10,827,983	1,496,000	176,920	27,302	---	1,700,222	29	--	1,870	1,899	192	2,091
501	5,101,898	578,400	204,425	--	---	782,825	54	--	723	777	---	777
502	1,046,988	144,800	28,403	--	---	173,203	11	--	181	192	---	192
503	15,542,942	1,007,200	383,996	4,905	---	1,396,101	83	--	1,259	1,342	---	1,342
505	4,600,300	744,800	96,051	8,377	---	849,228	22	--	931	953	---	953
506	13,918,659	1,109,600	122,483	40,397	---	1,272,480	26	--	1,387	1,413	---	1,413
507	1,084,385	128,800	10,448	4,797	---	144,045	2	--	161	163	---	163
508	36,587,423	3,759,200	382,491	21,373	648,000	4,811,064	91	712	4,699	5,502	---	5,502
509	967,921	173,600	25,333	1,818	---	200,751	6	--	217	223	---	223
513	5,210,165	246,400	--	--	---	246,400	--	--	308	308	---	308
514	4,591,167	796,800	8,114	765	---	805,679	1	--	996	997	10	1,007
515	6,996,832	1,262,400	46,145	21,160	---	1,329,705	12	--	1,578	1,590	---	1,590
516	13,363,262	1,380,800	117,633	2,020	312,000	1,812,453	24	339	1,726	2,089	---	2,089
517	49,847,719	3,060,000	397,734	35,974	540,000	4,033,708	89	587	3,825	4,501	---	4,501
518	3,879,142	661,600	8,522	3,060	---	673,182	2	--	827	829	106	935
519	11,391,156	874,400	6,881	3,551	---	884,832	2	--	1,093	1,095	---	1,095
521	9,054,685	944,000	31,633	18,902	396,000	1,390,535	9	429	1,180	1,618	---	1,618
522	4,714,742	240,000	21,060	1,530	132,000	394,590	3	143	300	446	---	446
525	6,652,973	743,200	35,846	14,535	---	793,581	7	--	929	936	529	1,465
526	2,942,209	129,600	282,711	6,885	---	419,196	87	--	162	249	---	249
529	2,666,359	257,600	50,814	2,203	---	310,617	11	--	322	333	---	333
530	1,331,497	524,800	6,631	3,825	---	535,256	2	--	656	658	---	658
531	3,652,465	469,600	68,149	11,383	---	549,132	16	--	587	603	---	603
532	17,897,276	1,992,000	14,921	33,112	---	2,040,033	5	--	2,490	2,495	---	2,495
533	3,795,581	400,000	22,448	11,085	---	433,533	6	--	500	506	---	506
534	2,358,339	326,400	17,772	6,403	---	350,575	5	--	408	413	---	413
535	25,985,526	2,129,600	--	14,556	---	2,144,156	2	--	2,662	2,664	---	2,664
536	2,536,529	184,800	40,357	4,060	---	229,217	10	--	231	241	---	241
539	42,853,361	4,024,000	1,286,671	17,844	---	5,328,515	277	--	5,030	5,307	578	5,885
540	13,376,007	1,831,200	543,114	24,023	---	2,398,337	128	--	2,289	2,417	253	2,670
541	20,202,423	2,736,000	98,917	40,702	---	2,875,619	25	--	3,420	3,445	---	3,445
542	641,667	133,600	16,045	1,857	---	151,502	4	--	167	171	31	202
546	5,910,634	604,800	84,444	6,885	---	696,129	29	--	756	785	---	785
548	12,803,346	2,569,600	508,812	7,069	---	3,085,481	117	--	3,212	3,329	---	3,329
549	2,741,927	212,800	137,227	9,480	---	359,507	29	--	266	295	---	295
550	3,657,804	356,800	126,508	1,087	---	484,395	26	--	446	472	---	472
551	9,873,950	724,800	352,061	44,019	*100,312	1,221,192	202	--	906	1,108	459	1,567
552	1,530,084	96,000	35,999	2,111	---	134,110	8	--	120	128	---	128
553	594,154	78,400	6,490	--	---	84,890	1	--	98	99	---	99
554	9,251,354	616,800	156,516	12,336	---	785,652	36	--	771	807	---	807
556	11,964,204	1,296,800	41,216	11,627	108,000	1,457,643	25	119	1,621	1,765	39	1,804
557	1,126,869	67,200	10,701	2,733	---	80,634	2	--	84	86	---	86
562	1,716,975	256,000	29,274	2,295	---	287,569	7	--	320	327	---	327
563	4,389,926	684,000	55,084	6,816	---	745,900	13	--	855	868	---	868
565	9,943,642	1,744,800	29,133	40,494	---	1,814,427	17	--	2,181	2,198	---	2,198
568	2,166,593	116,000	--	--	---	116,000	--	--	145	145	---	145
569	31,925,018	2,631,200	395,499	15,514	---	3,042,213	96	--	3,289	3,385	---	3,385
570	8,267,846	963,200	114,297	--	---	1,077,497	29	--	1,204	1,233	---	1,233
571	21,012,935	1,540,000	12,090	2,295	---	1,554,385	2	--	1,925	1,927	---	1,927
572	1,074,465	102,400	6,458	8,106	---	116,964	4	--	128	132	---	132
573	5,383,244	627,200	100,753	11,361	---	739,314	25	--	784	809	---	809
574	1,257,438	47,200	38,925	4,544	---	90,669	10	--	59	69	---	69
578	6,595,277	448,800	--	--	---	448,800	--	--	561	561	---	561
579	6,533,590	1,069,600	70,847	4,896	---	1,145,343	16	--	1,337	1,353	---	1,353
580	9,924,816	726,400	49,871	1,635	---	777,906	33	--	908	941	---	941
581	6,013,460	412,000	253,346	4,819	---	670,165	54	--	515	569	---	569
585	3,181,532	545,600	--	2,020	---	547,620	0	--	682	682	---	682
587	4,613,375	550,400	127,009	--	---	677,409	30	--	688	718	6	724
588	11,948,409	1,453,600	70,839	4,988	---	1,529,427	10	--	1,817	1,827	---	1,827
589	8,496,735	723,200	48,804	1,583	---	773,587	11	--	904	915	---	915
590	2,196,484	184,000	1,960	4,314	---	190,274	1	--	230	231	---	231
593	1,482,969	169,600	55,389	--	---	224,989	14	--	212	226	105	331
595	2,466,583	420,800	95,243	--	---	516,043	21	--	526	547	---	547
597	1,201,239	284,000	14,033	1,951	---	299,984	3	--	355	358	---	358
599	5,089,525	480,800	256,306	--	---	737,106	60	--	601	661	---	661
600	1,296,639	266,400	53,506	2,295	---	322,201	11	--	333	344	---	344
601	2,292,405	188,800	74,868	104	---	263,772	18	--	236	254	---	254
602	2,779,914	177,600	47,710	6,885	---	232,195	12	--	222	234	---	234
603	6,254,687	673,600	12,995	2,968	---	689,563	3	--	842	845	---	845
Sub-Total	576,437,075	58,840,800	8,075,612	615,634	2,136,000 *100,312	69,768,358	2,036	2,329	73,551	77,916	2,308	80,575

Allot. No.	Total Veg. Prod.	Livestock	Deer	Antelope	Wild Horses *Big Horn Sheep	Total (lb) Allocation	Wild-Life	Wild Horses	Live-Stock	Total Suitable AUMs	Un-Suitable AUMs	Total AUMs
	Pounds of Forage Allocated						Competitive AUM Allocation					
Less Intensive Management												
510	72,322	3,200	6,672	--	---	9,872	1	--	4	5	---	5
520	7,633,332	952,000	31,959	--	---	983,959	7	--	1,190	1,197	---	1,197
544	547,225	78,400	4,887	2,570	---	85,857	1	--	98	99	---	99
558	567,577	30,400	6,446	322	---	37,168	2	--	38	40	---	40
559	93,391	4,800	19,543	837	---	25,180	1	--	6	7	---	7
560	519,957	23,200	4,395	--	---	27,595	1	--	29	30	---	30
561	5,553,528	651,200	22,288	1,041	---	674,529	5	--	814	819	---	819
564	520,869	69,600	30,601	--	---	100,201	7	--	87	94	---	94
576	448,684	43,200	15,314	1,331	---	59,845	4	--	54	58	---	58
586	596,926	49,600	2,294	69	---	51,963	1	--	62	63	---	63
591	1,580,367	112,000	42,790	3,856	---	158,646	11	--	140	151	---	151
592	221,704	9,600	---	--	---	9,600	--	--	12	12	---	12
594	120,379	16,800	4,618	--	---	21,418	1	--	21	22	---	22
596	338,826	24,800	6,761	1,020	---	32,581	2	--	31	33	---	33
598	1,456,237	59,200	17,558	2,999	---	79,757	4	--	74	78	---	78
Sub-total	20,271,324	2,128,000	216,126	14,045		2,358,171	48		2,660	2,708		2,708
Management with Private Lands												
453	37,059	800	608	--	---	1,408	--	--	1	1	---	1
454	159,079	6,400	5,071	--	---	11,471	1	--	8	9	---	9
455	49,752	1,600	676	--	---	2,276	--	--	2	2	---	2
456	363,478	24,800	13,384	796	---	38,980	3	--	31	34	---	34
457	4,446	--	203	--	---	203	--	--	--	0	---	0
458	181,356	21,600	5,147	--	---	26,747	1	--	27	28	---	28
459	841,670	163,200	9,439	--	---	172,639	2	--	204	206	---	206
461	60,679	6,400	---	--	---	6,400	--	--	8	8	---	8
463	29,386	800	2,351	367	---	3,518	--	--	1	1	---	1
464	27,092	800	---	--	---	800	--	--	1	1	---	1
465	241,861	6,400	20,338	367	---	27,105	4	--	8	12	---	12
466	691,953	89,600	9,309	1,447	---	100,356	2	--	112	114	---	114
467	156,808	16,000	510	--	---	16,510	--	--	20	20	---	20
469	42,690	1,600	358	69	---	2,027	--	--	2	2	---	2
470	6,822	--	608	--	---	608	--	--	0	0	---	0
471	21,927	2,400	---	--	---	2,400	--	--	3	3	---	3
472	45,915	1,600	397	115	---	2,112	--	--	2	2	---	2
473	85,945	8,800	---	--	---	8,800	--	--	11	11	---	11
476	176,128	20,000	---	199	---	20,199	--	--	25	25	---	25
477	97,200	4,800	---	--	---	4,800	--	--	6	6	---	6
479	73,602	3,200	---	--	---	3,200	--	--	4	4	---	4
483	43,936	000	3,694	--	---	3,694	1	--	0	1	---	1
485	69,871	3,200	474	--	---	3,674	--	--	4	4	---	4
486	72,446	800	---	1,515	---	2,315	--	--	1	1	---	1
487	412,963	69,600	1,591	51	---	71,242	--	--	87	87	---	87
491	235,072	28,000	1,912	--	---	29,912	--	--	35	35	---	35
492	42,380	1,600	24	7	---	1,631	--	--	2	2	---	2
504	409,396	12,000	18,564	711	---	31,275	4	--	15	19	---	19
511	228,899	21,600	---	--	---	21,600	--	--	27	27	---	27
515-3	149,468	25,600	3,393	497	---	29,490	--	--	32	33	---	33
523	475,734	57,600	12,044	1,009	---	70,653	3	--	72	75	---	75
537	622,676	25,600	6,761	--	---	32,361	2	--	32	34	---	34
543	86,328	4,000	5,408	--	---	9,408	1	--	5	6	---	6
545	746,068	71,200	4,340	--	---	7,554	1	--	89	90	---	90
555	53,083	1,600	---	--	---	1,600	--	--	2	2	---	2
566	239,972	9,600	2,340	--	---	11,940	--	--	12	12	---	12
567	473,288	55,200	7,166	2,433	---	64,799	2	--	69	71	---	71
575	370,344	42,400	38,081	139	---	80,620	8	--	53	61	---	61
577	1,787,345	224,800	24,618	--	---	249,418	6	--	281	287	---	287
582	107,224	4,000	1,622	--	---	5,622	--	--	5	5	---	5
606	54,446	7,200	20,007	--	---	27,207	--	--	9	9	---	9
607	202,787	16,800	1,529	535	---	18,864	--	--	21	21	---	21
608	177,300	7,200	2,917	1,347	---	11,464	1	--	9	10	---	10
609	362,029	38,400	8,004	225	---	46,629	1	--	48	49	---	49
610	110,967	4,000	1,883	240	---	6,123	--	--	5	5	---	5
611	86,917	5,600	5,270	318	---	11,188	1	--	7	8	---	8
612	75,045	4,800	1,001	--	---	5,801	--	--	6	6	---	6
613	247,571	13,600	26,306	35	---	39,941	6	--	17	23	---	23
616	1,316,321	142,400	10,919	--	---	153,319	3	--	178	181	---	181
618	315,859	40,000	---	--	---	40,000	--	--	50	50	---	50
619	740,322	67,200	5,007	482	---	72,689	1	--	84	85	---	85
620	174,356	20,800	1,086	--	---	21,886	--	--	26	26	---	26
621	243,348	19,200	1,154	---	---	20,354	--	--	24	24	---	24
623	273,426	61,600	4,655	457	---	66,712	1	--	77	78	---	78
624	604,546	71,200	7,113	---	---	78,313	2	--	89	91	---	91
625	220,468	8,800	13,490	---	---	22,290	3	--	11	14	---	14
626	269,370	21,600	1,626	160	---	23,386	--	--	27	27	---	27
627	735,482	110,400	30,614	2,203	---	143,217	7	--	138	145	---	145
Sub-total	16,231,901	1,700,000	343,002	15,724		2,058,726	68		2,125	2,193	2,308	2,193
Total	612,940,300	62,688,800	8,634,740	645,603	2,136,000 *100,312	74,185,455	2,152	2,329	78,336	83,168	2,308	85,476

Table C-8 Key
Existing and Proposed Livestock Use.

Livestock Class

C = Cattle
S = Sheep
H = Horse

Grazing Systems

Example:

3	DR	(SP - S - F)
Number of Pastures	Grazing System (see below)	Seasons Used SP - Spring F - Fall S - Summer W - Winter

Abbreviation	System
D	Deferment
DAS	Deferred after seed ripe
DR	Deferred rotation
RR	Rest rotation
SL	Season long
SL, Sp-D	Short-long season with spring deferrment
YL	Year long
2/3 SR	Graze two years after seed ripe - rest third year

Appendix Table C-8

Existing and Proposed Livestock Use

Allot. No.	Land Ownership (Acres) BLM	State	Private	Total	Season-of-Use Limit Existing	Proposed	Grazing Systems Existing	Proposed	Live-stock Class	Livestock Use (AUMs) Active Pref.	5-Year Licensed AUM	Pro-posed	% Change[1/]
Intensive Management													
0450	4,023.4	----	630.0	4,653.4	4/16-11/15	5/1-10/31	SL	2DR(SP-SU-F)	C	360	360	298	-17
0500	28,540.4	9,083.8	824.0	38,448.2	4/8-6/15	5/1-6/30	2DR	3RR(SP)	C	4,478	5,990	1,870	-58
0501	18,140.7	1,020.0	182.0	19,342.7	6/16-9/30	7/1-9/30	SL	S-L,SP-D	C,H	1,788	1,654	723	-60
								2DR(SU-F)					
0502	3,904.6	----	32.0	3,936.6	5/1-9/30	5/16-9/30	SL	2DR(SP-SU-F)	C	800	313	181	-77
0503	17,265.8	640.0	6,853.1	24,758.9	4/16-12/15	5/1-9/30	SL	2DR(SU-F)	C,S	3,344	2,657	1,259	-62
0505	6,135.4	519.2	2,336.4	8,991.0	4/1-11/30	5/1-9/30	SL	3RR(SP-SU-F)	C,H	446	468	931	+109
0506	22,008.9	7,408.3	8,463.6	37,880.8	4/1-10/31	5/1-10/31	SL	2RR(SP)	C,S,H	3,547	3,586	1,387	-61
								2DR(SU-F)					
0507	1,932.7	640.0	817.9	3,390.6	4/1-9/30	4/16-9/30	SL	3RR(SP-SU-F)	C	439	439	161	-63
0508	39,649.1	1,923.9	1,014.6	42,587.6	4/1-9/15	4/16-10/31	7DR	7DR(SP-SU-F)	C	4,274	4,412	4,699	+10
0509	1,577.0	----	38.9	1,615.9	4/16-6/15	5/1-9/30	SL	2/3SR	C	169	170	217	+28
0513	10,069.0	200.0	1,833.4	12,102.4	4/1-5/20	4/16-6/15	SL	2DR(SP)	C,S,H	267	338	308	+15
								3RR(SP)					
0514	6,357.9	----	2.0	6,359.9	4/1-5/20	4/16-6/15	SL	3RR(SP)	C,S,H	1,250	438	996	-20
0515	13,012.3	1,278.0	4,127.7	18,418.0	5/21-11/15	5/21-10/31	2DR	2DR(SP-SU-F)	C	1,276	2,056	1,578	+24
0516	16,608.4	1,237.0	2,374.7	20,220.1	4/1-10/31	4/16-10/31	3DR	2RR(SP)	C	1,712	1,980	1,726	+1
								2DR(SU-F)					
0517	67,504.0	3,675.0	2,669.0	73,848.0	4/1-10/31	4/16-8/20	7DR	4DR 3RR(SP)	C,H	4,720	4,596	3,825	-19
0518	4,626.9	----	4.0	4,630.9	4/1-6/10	4/16-10/31	SL	3RR(SP-SU-F)	C,S,H	1,459	1,326	827	-43
0519	11,423.5	998.2	240.0	12,661.7	4/1-12/15	4/16-10/31	SL	3RR(SP-SU-F)	C,S,H	1,750	1,126	1,093	-38
0521	13,915.8	1,280.0	1,545.1	16,740.9	4/1-10/31	4/16-8/20	4DR	2RR(SP)	C,S,H	1,694	1,642	1,180	-30
								3RR(SP-SU-F)					
0522	5,537.0	640.0	----	6,177.0	4/1-5/30	4/16-6/15	SL	S-L,SP-D	C	651	650	300	-54
								3RR(SP)					
0525	7,199.5	5.0	----	7,204.5	6/1-11/30	6/1-10/31	SL	3RR(SP-SU-F)	C,S	886	884	929	+5
0526	5,670.3	1,065.0	1,974.0	8,709.3	5/1-5/31	5/1-5/31	SL	2DR(SP)	S	274	102	162	-41
0529	3,396.2	----	64.0	3,460.2	4/1-9/30	5/11-9/30	SL	3RR(SP-SU-F)	C,H	726	742	322	-56
0530	1,541.0	----	----	1,541.0	4/1-9/15	4/16-9/30	SL	3RR(SP-SU-F)	C	180	181	656	+264
0531	5,798.9	957.0	378.0	7,133.9	4/16-9/15	5/1-9/30	SL	3RR(SP-SU-F)	C	1,699	1,700	587	-65
0532	25,696.7	1,280.0	2,790.3	29,767.0	4/16-6/15	4/16-6/15	SL	3RR(SP)	C	2,725	2,092	2,490	-9
0533	6,105.0	490.0	1,411,1	8,006.1	6/16-9/18	6/16-10/31	SL	3DR	C	1,609	1,400	500	-69
0534	3,666.0	----	265.0	3,931.0	7/10-9/18	6/16-10-31	SL	3DR	C	743	638	408	-45
0535	50,721.0	1,920.0	12,826.4	65,467.4	10/1-2/28	10/1-2/15	SL	D(F-W)	C,H	2,262	1,900	2,662	+18
0536	4,138.5	----	23.0	4,161.5	8/1-9/30	6/16-9/30	SL	2DR(SU-F)	C	374	374	231	-38
0539	98,843.6	5,170.0	3,241.5	107,255.1	4/16-9/22	4/16-9-30	3RR	2DR(SU-F)	C,H	7,338	7,081	5,030	-31
							4DR	3RR(SP)1-DAS					
0540	44,402.8	3,218.0	190.0	47,810.8	4/1-11/31	4/16-9/30	4DR	1DAS 3RR(SP)	C	3,726	4,199	2,289	-38
0541	38,961.0	2,481.0	2,356.7	43,798.7	4/16-10/9	4/16-10/31	5DR	3RR(SP-SU-F)	C	4,345	3,736	3,420	-21
0542	1,637.5	160.0	----	1,797.5	11/1-11/30	6-16/9-30	SL	1D(SP & F)	C	87	87	167	+92
								2DR(SP)					
0546	13,920.9	900.0	2,820.8	17,641.7	5/16-10/31	5/16-10/31	SL	2RR(SP)1-DAS	C	1,020	922	756	-26
0548	34,529.8	2,210.0	5,515.6	42,255.4	5/1-10/31	5/1-10/31	SL	3RR(SP-SU-F)	C	2,935	2,989	3,212	+9
0549	5,028.2	640.0	1,019.3	6,687.5	4/16-11/15	5/1-10/31	SL	3RR(SP-SU-F)	C	356	357	266	-25
0550	8,471.0	645.7	1,602.6	10,719.3	5/1-10/31	5/1-10/31	SL	3RR(SP-SU-F)	C	400	399	446	+12
0551	20,698.5	944.6	440.0	22,083.1	3/25-6/30	5/1-6/30	SL	1RR 2DR(SP)	C	1,200	1,200	906	-25
0552	1,776.0	----	151.0	1,927.0	4/1-7/31	5/1-8/31	SL	2DR(SP-SU-F)	C,H	139	138	120	-14
0553	657.8	1,410.0	25.0	2,092.8	4/1-7/31	4/16-8/31	SL	2DR(SP-SU-F)	C	128	128	98	-23
0554	15,752.5	1,222.0	440.0	17,414.5	4/16-9/30	5/1-9/30	SL	2RR(SP)	C	2,412	2,413	771	-68
								3RR(SP-SU-F)					
0556	10,845.6	638.7	2,256.5	13,740.8	5/22-9/30	5/1-10/31	2RR(SP)	1-DAS	C	1,532	1,473	1,621	+6
							1D(SU&F)	3RR(SP)					
0557	1,443.6	----	31.0	1,474.6	4/16-9/15	5/1-10/31	SL	S-L, SP-D	C	255	255	84	-67
0562	3,416.4	----	680.0	4,096.4	4/16-11/15	4/16-6/30	SL	3DR	C	229	200	320	+40
0563	4,669.7	----	148.0	4,817.7	4/1-11/15	6/1-9/30	SL	2DR(SP)	C	985	891	855	-13
0565	13,526.4	635.0	47.5	14,208.9	4/1-9/30	4/1-10/31	3DR	1DAS	C,S,H	2,410	2,383	2,181	-10
								2DR(SP & F)					
0568	3,383.5	130.0	775.4	4,288.9	4/16-5/31	4/16-6/15	SL	2DR(SP)	C	113	113	145	+28
0569	48,236.2	2,910.8	8,053.8	59,200.8	4/1-11/15	4/16-10/31	SL	2RR(SP)	C,H	6,329	4,950	3,289	-48
								2DR(SU-F)					
0570	8,643.3	4,383.4	6,332.5	19,359.2	7/1-9/30	7/1-10/31	SL	2DR(SU-F)	C,H	1,127	1,109	1,204	+7
0571	29,401.6	455.8	13,018.7	42,876.1	11/1-1/31	11/1-1/31	SL	D(F-W)	C	1,491	1,491	1,925	+29
0572	1,088.1	18.0	404.3	1,510.4	4/16-8/15	5/1-10/31	SL	2DR(SP-SU-F)	C	212	212	128	-40
0573	9,532.3	3,178.8	824.5	13,535.6	6/16-10/15	6/16-9/30	SL	2DR(SU-F)	C	2,013	2,014	784	-61
0574	2,635.6	----	25.0	2,660.6	5/1-6/15	5/16-6/15	SL	2RR(SP)	C	774	774	59	-92
0578	9,857.1	300.0	3,594.3	13,751.4	11/15-2/28	10/1-1/31	SL	D(F-W)	C	839	852	561	-33
0579	11,420.8	640.0	1,965.8	14,026.6	4/1-10/31	4/16-10/31	3RR	3DR 2DR(Su-F)	C	1,463	1,363	1,337	-9
0580	14,352.7	2,034.0	4,714.6	21,101.3	7/1-9/30	6/1-9/30	2DR	2DR(SU-F)	C	2,378	2,379	908	-62
0581	7,743.5	58.0	2,748.3	10,549.8	4/16-11/30	5/1-9/30	SL	2RR(SP)	C,H	925	823	515	-44
0585	4,108.3	----	30.0	4,138.3	4/15-6/15	4/16-10/31	SL	2DR(SP & F)	C	1,057	716	682	-35
0587	10,199.3	4,814.9	384.2	15,398.4	5/1-10/31	5/16-10/31	SL	4RR	C	2,271	1,169	688	-70
0588	14,368.0	1,280.0	640.0	16,288.0	4/1-7/31	4/16-10/31	SL	2RR (SP)	C	2,710	2,420	1,817	-33
0589	10,931.0	1,562.0	7,835.4	20,328.4	6/1-9/30	6/1-10/31	SL	2DR(SU-F)	C	2,103	1,180	904	-57
0590	2,512.8	----	160.0	2,672.8	10/1-10/31	7/1-10/31	SL	1-DAS	C	664	480	230	-65
0593	3,667.3	100.0	115.0	3,882.3	10/1-11/30	7/1-11/30	SL	1-DAS	C	90	90	212	+136
0595	4,368.0	245.0	1,662.0	6,275.0	7/1-10/31	7/1-9/30	SL	1D	C	600	538	526	-12
0597	1,635.5	----	290.0	1,925.5	4/1-6/30	5/1-9/30	SL	2DR(SP-SU-F)	C	200	220	355	+78
0599	14,961.1	4,455.1	30.0	19,446.2	5/1-12/31	5/1-10/31	SL	3RR(SP-SU-F)	C	1,754	1,163	601	-66
0600	2,635.0	50.0	243.0	2,928.0	4/16-6/15	5/1-9/30	SL	2/3 SR	C	143	215	333	+133
0601	6,323.8	640.0	3,501.8	10,465.6	6/16-9/30	5/16-10/31	SL	2DR(SP & F)	C	1,208	1,258	236	-80
0602	4,765.7	----	----	4,765.7	5/1-11/15	5/16-10/31	SL	2DR(SP & F)	C	695	630	222	-68
0603	7,759.7	230.0	40.0	8,029.7	4/1-5/31	4/16-6/30	SL	2DR(SP)	C,S,H	853	886	842	-1
Sub-total	959,277.4	84,021.2	132,074.3	1,175,372.9						107,411	100,115	73,551	-32

Appendix Table C-8 cont.

Allot. No.	Land Ownership (Acres) BLM	State	Private	Total	Season-of-Use Limit Existing	Proposed	Grazing Systems Existing	Proposed	Live-stock Class	Livestock Use (AUMs) Active Pref.	5-Year Licensed AUM	Pro-posed	% Change
Less Intensive Management													
0510	449.0	----	150.0	599.0	6/1-6/30	6/16-9/30	SL	SL	C	56	56	4	-93
0520	11,896.2	9,985.8	4,871.5	26,753.5	6/1-10/15	6/1-10/31	SL	SL	C,S	1,407	1,076	1,190	-15
0544	915.0	----	715.0	1,630.0	4/1-9/30	5/1-9/30	SL	SL	C	279	276	98	-65
0558	660.0	----	1,591.0	2,251.0	5/1-10/31	6/16-10-31	SL	SL	C	120	120	38	-68
0559	609.6	----	864.7	1,474.3	8/15-10/14	8/15-10/31	SL	SL	C	68	68	6	-91
0560	701.1	----	320.8	1,021.9	6/6-9/30	6/16-10/31	SL	SL	C	90	93	29	-68
0561	5,942.4	8,230.1	3,135.6	17,308.1	6/1-9/30	6/1-10/31	SL	SL	C	761	767	814	+7
0564	1,023.6	440.0	1,477.3	2,940.9	4/15-6/1	6/16-10/31	SL	SL	C	127	128	87	-31
0576	1,144.8	50.0	1,468.4	2,663.2	6/16-9/7	6/1-9/30	SL	SL	C	56	56	54	-4
0586	850.0	70.0	2,520.0	3,440.0	7/16-11/15	6/16-10/31	SL	SL	C	225	224	62	-72
0591	3,980.8	----	4,081.4	8,062.2	6/1-9/30	6/1-9/30	SL	SL	C	492	503	140	-72
0592	273.0	----	78.5	351.5	5/1-7/31	5/1-10/31	SL	SL	C	30	30	12	-60
0594	216.0	----	10.0	226.0	9/16-10/15	6/1-10/31	SL	SL	C	63	63	21	-67
0596	772.1	----	----	772.1	6/1-7/31	6/1-10/31	SL	SL	C	74	74	31	-58
0598	3,006.9	----	40.5	3,047.4	6/15-7/19	5/1-10/31	SL	SL	C	234	219	74	-68
Sub-Total	32,440.5	18,775.9	21,324.7	72,541.1						4,082	3,753	2,660	-35
Management with Private Lands													
0453	70.0	----	680.0	750.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	1	--
0454	398.0	355.0	1,304.2	2,057.2	3/1-2/28	3/1-2/28	YL	YL	C	0	0	8	--
0455	120.0	----	902.9	1,022.9	3/1-2/28	3/1-2/28	YL	YL	C	0	0	2	--
0456	986.0	520.0	2,018.0	3,524.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	31	--
0457	25.0	----	880.0	905.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	--	--
0458	508.8	----	2,327.8	2,836.6	3/1-2/28	3/1-2/28	YL	YL	C	0	0	27	--
0459	758.4	1,187.0	383.0	2,328.4	3/1-2/28	3/1-2/28	YL	YL	C	0	0	204	--
0461	92.4	----	519.5	611.9	3/1-2/28	3/1-2/28	YL	YL	C	0	0	8	--
0463	35.0	10.0	880.0	925.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	1	--
0464	38.0	----	1,295.0	1,333.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	1	--
0465	448.8	2,791.4	2,756.1	5,996.3	3/1-2/28	3/1-2/28	YL	YL	C	0	0	8	--
0466	777.2	8.0	2,894.0	3,679.2	3/1-2/28	3/1-2/28	YL	YL	C	0	0	112	--
0467	120.0	----	2,720.0	2,840.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	20	--
0469	67.0	502.0	1,249.8	1,818.8	3/1-2/28	3/1-2/28	YL	YL	C	0	0	2	--
0470	20.0	----	414.0	434.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	0	--
0471	28.0	----	125.0	153.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	3	--
0472	51.0	----	1,943.6	1,994.6	3/1-2/28	3/1-2/28	YL	YL	C	0	0	2	--
0473	128.0	----	911.9	1,039.9	3/1-2/28	3/1-2/28	YL	YL	C	0	0	11	--
0476	158.0	----	540.0	698.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	25	--
0477	108.0	----	353.0	461.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	6	--
0479	41.0	----	390.0	431.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	4	--
0483	60.0	630.0	1,443.2	2,133.2	3/1-2/28	3/1-2/28	YL	YL	C	0	0	0	--
0485	65.4	----	1,280.0	1,345.4	3/1-2/28	3/1-2/28	YL	YL	C	0	0	4	--
0486	108.0	----	315.0	423.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	1	--
0487	503.0	----	1,620.0	2,123.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	87	--
0491	504.6	----	4,616.9	5,121.5	3/1-2/28	3/1-2/28	YL	YL	C	0	0	35	--
0492	40.0	----	130.0	170.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	2	--
0504	525.0	640.0	891.0	2,056.0	4/16-10/15	3/1-2/28	SL	YL	C	110	114	15	-86
0511	253.0	697.0	730.0	1,680.0	3/1-2/28	3/1-2/28	SL	YL	C	46	46	27	-41
515-3	243.0	----	4,656.6	4,899.6	3/1-2/28	3/1-2/28	YL	YL	C	0	0	32	--
0523	490.8	670.0	10,567.2	11,728.0	4/1-10/31	3/1-2/28	SL	YL	C	67	65	72	+7
0537	820.0	----	2,018.4	2,838.4	7/8-9/15	3/1-2/28	SL	YL	C	79	81	32	-59
0543	596.0	400.0	935.0	1,931.0	9/1-9/30	3/1-2/28	SL	YL	C	17	17	5	-71
0545	1,006.6	----	2,174.0	3,180.6	4/16-9/15	3/1-2/28	SL	YL	C	150	150	89	-41
0555	120.0	60.0	520.0	700.0	10/1-10/31	3/1-2/28	SL	YL	C	8	8	2	-75
0566	434.5	----	----	434.5	3/1-2/28	3/1-2/28	YL	YL	C	56	56	12	-79
0567	916.4	----	813.0	1,729.4	4/16-9/22	3/1-2/28	SL	YL	C	120	120	69	-43
0575	751.0	----	3,562.0	4,313.0	3/1-2/28	3/1-2/28	YL	YL	C	54	54	53	-2
0577	1,604.5	3,940.2	20.0	5,564.7	6/16-10/15	3/1-2/28	SL	YL	C	68	68	281	+313
0582	190.0	588.0	----	778.0	4/16-5/31	3/1-2/28	SL	YL	C	43	42	5	-88
0606	150.0	235.0	406.3	791.3	3/1-2/28	3/1-2/28	YL	YL	C	54	55	9	-83
0607	304.9	----	1,807.3	2,112.2	3/1-2/28	3/1-2/28	YL	YL	C	75	0	21	-72
0608	409.0	----	1,481.7	1,890.7	3/1-2/28	3/1-2/28	YL	YL	C	114	0	9	-92
0609	476.9	1,125.3	2,552.0	4,154.2	3/1-2/28	3/1-2/28	YL	YL	C	42	74	48	+14
0610	183.0	----	45.0	228.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	5	—
0611	356.9	----	870.1	1,227.0	3/1-2/28	3/1-2/28	YL	YL	C	35	7	7	-80
0612	97.0	----	349.0	446.0	3/1-2/28	3/1-2/28	YL	YL	C	24	0	6	-75
0613	506.0	640.0	1,899.0	3,045.0	3/1-2/28	3/1-2/28	YL	YL	C	63	13	17	-73
0616	995.0	2,840.0	3,315.0	7,150.0	3/1-2/28	3/1-2/28	YL	YL	C	69	0	178	+158
0618	497.2	530.0	3,627.0	4,654.2	3/1-2/28	3/1-2/28	YL	YL	C	0	0	50	--
0619	635.0	213.0	2,723.9	3,571.9	3/1-2/28	3/1-2/28	YL	YL	C	63	13	84	33
0620	160.0	----	1,110.0	1,270.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	26	--
0621	167.0	----	720.0	887.0	3/1-2/28	3/1-2/28	YL	YL	C	0	0	24	--
0623	340.7	640.0	2,544.7	3,525.4	3/1-2/28	3/1-2/28	YL	YL	C	32	0	77	+141
0624	595.0	1,476.2	1,755.0	3,826.2	3/1-2/28	3/1-2/28	YL	YL	C	61	61	89	+46
0625	869.0	235.0	2,272.8	3,376.8	3/1-2/28	3/1-2/28	YL	YL	C	76	0	11	-86
0626	416.0	683.0	1,844.0	2,943.0	3/1-2/28	3/1-2/28	YL	YL	C	39	0	27	-31
0627	1,209.3	2,200.0	1,813.0	5,222.3	4/16-6/15	3/1-2/28	SL	YL	C	64	97	138	+116
Sub-total	22,578.3	23,816.1	92,915.9	139,310.3						1,629	1,141	2,125	-23
Grand Total	1,014,296.2	126,613.2	246,314.9	1,387,224.3						113,122	105,009	78,336	-31

1/ % Change - Reflects Proposed Use versus Active Preference.

Appendix Table C-9
Proposed Action 20-Year AUM Projections

Allot. No.	Initial Livestock Use (AUMs)	Increase Above Initial Use (AUMs): Grazing Management	Brush Control	Brush Control & Seeding	Total	% Change from Active Preference
Intensive Management						
450	298	113	78	154	643	+ 79
500	1,870	299	--	2,736	4,905	+ 9
501	723	51	310	679	1,763	- 1
502	181	49	70	142	442	- 44
503	1,259	277	1,018	114	2,668	- 20
505	931	196	--	329	1,456	+326
506	1,387	194	1,115	344	3,040	- 14
507	161	85	49	57	352	- 20
508	4,699	1,175	1,078	210	7,162	+ 67
509	217	150	--	71	438	+259
513	308	--	178	51	537	+201
514	996	--	109	572	1,677	+ 34
515	1,578	1,041	219	165	3,003	+235
516	1,726	725	770	167	3,388	+ 98
517	3,825	230	1,778	878	6,711	+ 42
518	827	273	213	--	1,313	- 10
519	1,093	601	582	21	2,297	+ 31
521	1,180	448	616	176	2,420	+ 43
522	300	--	334	95	729	+ 12
525	929	--	282	43	1,254	+ 42
526	162	31	38	156	387	+ 41
529	322	35	106	72	535	- 26
530	656	20	--	17	693	+385
531	587	147	189	171	1,094	- 36
532	2,490	1,096	235	112	3,933	+ 44
533	500	235	160	269	1,164	- 28
534	408	330	--	327	1,065	+ 43
535	2,662	27	271	--	2,960	+ 31
536	231	224	52	426	933	+149
539	5,030	1,962	3,156	1,131	11,279	+ 54
540	2,289	1,099	724	357	4,469	+ 20
541	3,420	1,197	685	489	5,791	+ 33
542	167	--	16	--	183	+110
546	756	454	402	--	1,612	+ 58
548	3,212	964	87	803	5,066	+ 73
549	266	64	48	442	820	+130
550	446	67	34	312	859	+115
551	906	480	112	1,033	2,531	+111
552	120	22	--	164	306	+110
553	98	20	--	30	148	+ 16
554	771	578	469	--	1,818	- 25
556	1,621	956	215	42	2,834	+ 85
557	84	--	--	51	135	- 47
562	320	147	--	492	959	+319
563	855	27	50	43	975	- 1
565	2,181	698	759	41	3,679	+ 53
568	145	77	72	84	378	+235
569	3,289	592	2,234	206	6,321	<- 1
570	1,204	96	298	--	1,598	+ 42
571	1,925	19	715	--	2,659	+ 78
572	128	--	--	38	166	- 22
573	784	956	136	675	2,551	+ 27
574	59	61	34	33	187	- 76
578	561	--	110	15	686	- 18
579	1,337	40	380	74	1,831	+ 25
580	908	254	366	20	1,548	- 35
581	515	366	213	28	1,122	+ 21
585	682	--	11	--	693	- 34
587	688	186	296	211	1,381	- 39
588	1,817	327	498	36	2,678	- 1
589	904	235	342	--	1,481	- 30
590	230	150	73	128	581	- 13
593	212	172	--	--	384	+427
595	526	47	173	--	746	+ 24
597	355	--	5	--	360	+ 80
599	601	421	295	443	1,760	<+ 1
600	333	143	--	--	476	+333
601	236	229	147	186	798	- 34
602	222	155	--	10	387	- 44
603	842	337	477	103	1,759	+206
Sub-total	73,551	21,650	23,482	16,274	134,957	+ 26
Less Intensive Management						
510	4	3	10	11	28	- 50
520	1,190	48	343	123	1,704	+ 21
544	98	12	--	57	167	- 40
558	38	29	46	9	122	+ 20
559	6	4	13	15	38	- 44
560	29	29	74	--	132	+ 47
561	814	41	143	86	1,084	+ 41
564	87	18	--	52	157	+ 24
576	54	4	13	42	113	+102
586	62	14	74	--	150	- 33
591	140	17	63	129	349	- 29
Less Intensive Management (cont.)						
592	12	10	--	--	22	- 27
594	21	2	--	23	46	- 27
596	31	14	--	44	89	+ 20
598	74	7	--	49	130	- 44
Sub-total	2,660	252	779	640	4,331	+ 6
Management with Private Lands						
453	1	1	--	--	2	0
454	8	10	--	--	18	0
455	2	2	--	--	4	0
456	31	13	--	--	44	0
457	--	1	--	--	1	0
458	27	5	--	--	32	0
459	204	10	--	--	214	0
461	8	1	--	--	9	0
463	1	1	--	--	2	0
464	1	2	--	--	3	0
465	8	11	--	--	19	0
466	112	8	--	--	120	0
467	20	4	--	--	24	0
469	2	1	--	--	3	0
470	0	1	--	--	1	0
471	3	3	--	--	6	0
472	2	2	--	--	4	0
473	11	2	--	--	13	0
476	25	24	--	--	49	0
477	6	3	--	--	9	0
479	4	1	--	--	5	0
483	0	3	--	--	3	0
485	4	1	--	--	5	0
486	1	1	--	--	2	0
487	87	4	--	--	91	0
491	35	21	--	--	56	0
492	2	1	--	--	3	0
504	15	25	21	--	61	- 46
511	27	5	7	--	39	- 15
515-3	32	--	--	--	32	---
523	72	6	--	--	78	+ 16
537	32	16	23	11	82	+ 14
543	5	3	13	15	36	+112
545	89	14	67	8	178	+ 19
555	2	2	--	--	4	- 50
566	12	4	28	--	44	- 21
567	69	29	--	56	154	+ 28
575	53	18	42	--	113	+109
577	281	--	58	--	339	+398
582	5	1	--	--	6	- 86
606	9	--	--	15	24	- 56
607	21	2	10	20	53	- 29
608	9	1	4	37	51	- 55
609	48	6	--	--	54	+ 29
610	5	2	--	--	7	- 59
611	7	2	--	5	14	- 60
612	6	--	--	--	6	- 75
613	17	2	--	48	67	+ 6
616	178	16	--	--	194	+181
618	50	--	--	--	50	---
619	84	18	--	--	102	+ 71
620	26	17	--	--	43	---
621	24	3	--	--	27	---
623	77	9	--	--	86	+169
624	89	13	--	--	102	+ 67
625	11	3	9	11	34	- 55
626	27	2	--	--	29	- 26
627	138	21	--	--	159	+148
Sub-total	2,125[1/]	355	282	226	2,988	+ 83
Grand Total	78,336	22,257	24,543	17,140	142,276	+ 26

[1/] Most of the increased allocation (742 AUMs) in this category is due to the licensing of previously unlicensed allotments.

Appendix Table C-10

Alternative #3 - Proposed Use and 20-Year AUM Projections

Allot.	Proposed Season-of-Use	Competitive AUM Allocation: Total Available	Wild-life	Wild Horses	Live-stock	Active Pref-erence	% Change	20-Year AUM Projections: Increase Due to Grazing Manage-ment	Total	% Change from Active Preference
Intensive Management										
450	6/1-10/31	227	10	--	217	360	- 40	191	408	+ 13
500	5/1-6/30	1,506	29	--	1,477	4,478	- 67	468	1,945	- 57
501	7/1-9/1	590	54	--	536	1,788	- 70	354	890	- 50
502	6/16-9/30	144	11	--	133	800	- 83	114	247	- 69
503	6/7-9/1	952	83	--	869	3,344	- 74	2,606	3,475	+ 4
505	5/1-9/1	748	22	--	726	446	+ 63	456	1,182	+165
506	6/1-9/1	1,021	26	--	995	3,547	- 72	1,040	2,035	- 43
507	4/16-9/1	116	2	--	114	439	- 74	110	224	- 49
508	5/1-9/1	4,040	91	1,107	2,842	4,274	- 34	1,692	4,534	+ 6
509	7/28-9/1	164	6	--	158	169	- 7	167	325	+ 92
513	4/30-6/15	174	---	--	174	267	- 35	256	430	+ 61
514	4/16-6/15	688	1	--	687	1,250	- 45	100	787	- 37
515	5/21-9/1	1,319	12	--	1,307	1,276	+ 2	1,152	2,459	+ 93
516	4/21-9/1	1,529	24	790	715	1,712	- 58	656	1,371	- 20
517	5/1-8/20	3,149	89	1,092	1,968	4,720	- 58	2,410	4,378	- 7
518	4/16-9/1	631	2	--	629	1,459	- 57	546	1,175	- 19
519	4/16-9/1	752	2	--	750	1,750	- 57	1,006	1,756	0
521	5/16-8/20	1,134	9	624	501	1,694	- 70	378	879	- 48
522	4/16-6/15	347	3	344	0	651	-100	80	80	- 88
525	6/1-9/1	670	7	--	663	886	- 25	316	979	+ 10
526	5/28-5/31	124	87	--	37	274	- 86	113	150	- 45
529	5/11-9/1	238	11	--	227	726	- 69	332	559	- 23
530	4/16-9/1	475	2	--	473	180	+163	20	493	+174
531	5/1-9/1	435	16	--	419	1,699	- 75	458	877	- 48
532	4/16-9/15	1,820	5	--	1,815	2,725	- 33	1,892	3,707	+ 36
533	6/16-9/1	405	6	--	399	1,609	- 75	195	594	- 63
534	6/16-10/31	305	5	--	300	743	- 60	722	1,022	+ 38
535	10/1-2/15	1,967	2	--	1,965	2,262	- 13	1,970	3,935	+ 74
536	6/16-9/1	171	10	--	161	374	- 57	284	445	+ 19
539	4/16-9/1	4,215	277	--	3,938	7,338	- 46	4,225	8,163	+ 11
540	6/7-9/30	1,730	128	--	1,602	3,726	- 57	2,175	3,777	+ 1
541	5/16-9/1	2,578	25	--	2,553	4,345	- 41	1,915	4,468	+ 3
542	6/16-9/1	135	4	--	131	87	+ 51	12	143	+ 64
546	6/7-10/31	560	29	--	531	1,020	- 48	680	1,211	+ 19
548	5/1-10/31	2,574	117	--	2,457	2,935	- 16	642	3,099	+ 6
549	5/1-10/31	210	29	--	181	356	- 49	266	447	+ 26
550	5/1-10/31	353	26	--	327	400	- 18	272	599	+ 50
551	5/28-6/30	781	202	--	579	1,200	- 52	507	1,086	- 10
552	5/22-8/31	88	8	--	80	139	- 42	115	195	+ 40
553	5/22-8/31	68	1	--	67	128	- 48	43	110	- 14
554	5/28-9/1	574	36	--	538	2,412	- 78	748	1,286	- 47
556	5/21-9/1	1,326	25	474	827	1,532	- 46	1,135	1,962	+ 28
557	6/1-9/1	61	2	--	59	255	- 77	101	160	- 37
562	6/1-6/30	218	7	--	211	229	- 8	90	301	+ 31
563	6/1-9/30	663	13	--	650	985	- 34	51	701	- 29
565	5/16-9/1	1,918	17	--	1,901	2,410	- 21	502	2,403	0
568	4/16-6/15	118	---	--	118	113	+ 4	135	253	+124
569	5/16-9/1	2,429	96	--	2,333	6,329	- 63	2,993	5,326	- 16
570	7/1-10/31	1,027	29	--	998	1,127	- 11	241	1,239	+ 10
571	11/1-1/31	1,422	2	--	1,420	1,491	- 5	1,983	3,403	+128
572	5/28-9/1	101	4	--	97	212	- 54	61	158	- 25
573	6/16-9/30	569	25	--	544	2,013	- 73	1,254	1,798	- 11
574	6/1-6/15	50	10	--	40	774	- 95	112	152	- 80
578	10/1-1/31	410	---	--	410	839	- 51	971	1,381	+ 65
579	5/16-9/1	1,196	16	--	1,180	1,463	- 19	214	1,394	- 5
580	6/7-9/30	612	33	--	579	2,378	- 76	499	1,078	- 55
581	6/1-9/30	393	54	--	339	925	- 63	654	993	+ 7
585	4/28-10/31	582	---	--	582	1,057	- 45	436	1,018	- 4
587	5/16-10/31	551	30	--	521	2,271	- 77	599	1,120	- 51
588	5/1-9/1	1,336	10	--	1,326	2,710	- 51	690	2,016	- 26
589	7/1-10/31	713	11	--	702	2,103	- 67	226	928	- 56
590	8/7-10/31	188	1	--	187	664	- 72	122	309	- 53
593	7/28-9/1	164	14	--	150	90	+ 67	276	426	+373
595	7/1-9/1	436	21	--	415	600	- 31	79	494	- 18
597	5/28-9/1	271	3	--	268	200	+ 34	5	273	+ 37
599	5/1-10/31	499	60	--	439	1,754	- 75	273	712	- 59
600	7/21-9/1	256	11	--	245	143	+ 71	157	402	+181
601	6/7-10/31	187	18	--	169	1,208	- 86	283	452	- 63
602	6/7-10/31	173	12	--	161	695	- 77	304	465	- 33
603	5/1-6/30	613	3	--	610	853	- 28	606	1,216	+ 43
Sub-total		58,189	2,036	4,431	51,722	107,411	- 52	46,736	98,458	- 8
Less Intensive Management										
510	6/16-9/1	5	1	--	4	56	- 93	4	8	- 86
520	6/14-10/31	1,197	7	--	1,190	1,407	- 15	155	1,345	- 4
544	6/7-9/1	99	1	--	98	279	- 65	55	153	- 45
558	6/16-10/31	40	2	--	38	120	- 68	52	90	- 25
559	8/15-9/1	7	1	--	6	68	- 91	6	12	- 82
560	6/16-10/31	30	1	--	29	90	- 68	47	76	- 16
561	6/14-10/31	819	5	--	814	761	+ 7	49	863	+ 13
564	6/16-10/31	94	7	--	87	127	- 31	50	137	+ 8
576	6/14-9/1	58	4	--	54	56	- 4	12	66	+ 18
586	6/16-10/31	63	1	--	62	225	- 72	55	117	- 48
591	6/7-9/1	151	11	--	140	492	- 72	60	200	- 59
592	5/21-9/1	12	---	--	12	30	- 60	12	24	- 2
594	6/7-9/1	22	1	--	21	63	- 67	3	24	- 62
596	6/1-9/1	33	2	--	31	74	- 58	36	67	- 9
598	5/28-9/1	78	4	--	74	234	- 68	20	94	- 60
Sub-total		2,708	48	--	2,660	4,082	- 35	616	3,276	- 20
SUMMARY:										
Intense		58,189	2,036	4,431	51,722	107,411	- 52	46,736	98,458	- 8
Less Intense		2,708	48	--	2,660	4,082	- 35	616	3,276	- 20
*Mgmt w/Private		2,193	68	--	2,125	1,629	+ 30**	355	2,480	+ 52%
GRAND TOTAL		63,090	2,152	4,431	56,507	113,122	- 50	47,707	104,214	- 8%

* This management level is the same as proposed action, except, it does not have brush control and seeding included.

** Most of the increased allocation (742 AUM's) in this category is due to the licensing of allotments previously unlicensed.

Appendix Table C-11

Alternative #4 - Proposed Use and 20-Year AUM Projections

	Competitive AUM Allocation						20 - Year AUM Projection				
							Increase due to				% Change
Allot.	Total Avail- able	Wild- life	Wild Horses	Live- stock	Active Pre- ference	% Change	Grazing Manage- ment	Brush Control	Brush Control & Seeding	Total	from Active Preference
Intensive Management											
450	370	10	--	360	360	- 0	102	78	154	694	+ 93
500	2,279	29	--	2,250	4,478	- 50	194	---	2,736	5,180	+ 16
501	932	54	--	878	1,788	- 51	26	310	679	1,893	+ 6
502	230	11	--	219	800	- 73	25	70	142	456	- 43
503	1,610	83	--	1,527	3,344	- 54	139	1,018	114	2,798	- 16
505	1,144	22	--	1,122	446	+152	186	---	329	1,637	+267
506	1,696	26	--	1,670	3,547	- 53	97	1,115	344	3,226	- 9
507	196	2	--	194	439	- 56	43	49	57	343	- 22
508	6,602	91	712	5,799	4,274	+ 36	1,116	1,078	210	8,203	+ 92
509	268	6	--	262	169	+ 55	143	---	71	476	+182
513	370	---	--	370	267	+ 39	---	178	51	599	+124
514	1,196	1	--	1,195	1,250	- 4	---	109	572	1,876	+ 50
515	1,908	12	--	1,896	1,276	+ 49	989	219	165	3,269	+156
516	2,507	24	339	2,144	1,712	+ 25	689	770	167	3,770	+120
517	5,401	89	587	4,725	4,720	<+ 1	207	1,778	878	7,588	+ 61
518	995	2	--	993	1,459	- 32	177	213	---	1,383	- 5
519	1,314	2	--	1,312	1,750	- 25	481	582	21	2,396	+ 37
521	1,942	9	429	1,504	1,694	- 11	358	616	176	2,654	+ 57
522	535	3	143	389	651	- 40	---	334	95	818	+ 26
525	1,123	7	--	1,116	886	+ 26	---	282	43	1,441	+ 63
526	299	87	--	212	274	- 23	25	38	156	431	+ 57
529	400	11	--	389	726	- 46	23	106	72	590	- 19
530	790	2	--	788	180	+338	19	---	17	824	+358
531	724	16	--	708	1,699	- 58	74	189	171	1,142	- 33
532	2,994	5	--	2,989	2,725	+ 10	1,041	235	112	4,377	+ 61
533	607	6	--	601	1,609	- 63	118	160	269	1,148	- 29
534	496	5	--	491	743	- 34	215	---	327	1,033	+ 39
535	3,197	2	--	3.195	2,262	+ 41	26	271	---	3,492	+ 54
536	289	10	--	279	374	- 25	179	52	426	936	+150
539	6,368	277	--	6,091	7,338	- 17	1,570	3,156	1,131	11,948	+ 63
540	2,900	128	--	2,772	3,726	- 26	778	724	357	4,631	+ 24
541	4,134	25	--	4,109	4,345	- 5	1,077	685	489	6,360	+ 46
542	205	4	--	201	87	+131	---	16	---	217	+149
546	942	29	--	913	1,020	- 10	409	402	---	1,724	+ 69
548	3,995	117	--	3,878	2,935	+ 32	916	87	803	5,684	+ 94
549	354	29	--	325	356	- 9	58	48	442	873	+145
550	566	26	--	540	400	+ 35	64	34	312	950	+138
551	1,330	202	--	1,128	1,200	- 6	432	112	1,033	2,705	+125
552	154	8	--	146	139	+ 5	21	---	164	331	+138
553	119	1	--	118	128	- 8	18	---	30	166	+ 30
554	968	36	--	932	2,412	- 61	289	469	---	1,690	- 30
556	2,118	25	119	1,974	1,532	+ 29	908	215	42	3,139	+105
557	103	2	--	101	255	- 60	---	---	51	152	- 40
562	392	7	--	385	229	+ 68	140	---	492	1,017	+344
563	1,042	13	--	1,029	985	+ 4	26	50	43	1,148	+ 17
565	2,638	17	--	2,621	2,410	+ 9	663	759	41	4,084	+ 69
568	174	---	--	174	113	+ 54	73	72	84	403	+257
569	4,062	96	--	3,966	6,329	- 37	385	2,234	206	6,791	+ 7
570	1,480	29	--	1,451	1,127	+ 29	91	298	---	1,840	+ 63
571	2,312	2	--	2,310	1,491	+ 55	18	715	---	3,043	+104
572	158	4	--	154	212	- 27	---	---	38	192	- 9
573	971	25	--	946	2,013	- 53	478	136	675	2,235	+ 11
574	83	10	--	73	774	- 91	31	34	33	171	- 78
578	673	---	--	673	839	- 20	---	110	15	798	- 5
579	1,624	16	--	1,608	1,463	+ 10	38	380	74	2,100	+ 44
580	1,129	33	--	1,096	2,378	- 54	127	366	20	1,609	- 32
581	683	54	--	629	925	- 32	238	213	28	1,108	+ 20
585	818	---	--	818	1,057	- 23	---	11	---	829	- 22
587	862	30	--	832	2,271	- 63	93	296	211	1,432	- 37
588	2,192	10	--	2,182	2,710	- 19	262	498	36	2,978	+ 10
589	1,098	11	--	1,087	2,103	- 48	153	342	---	1,582	- 25
590	277	1	--	276	664	- 58	75	73	128	552	- 17
593	271	14	--	257	90	+186	163	---	---	420	+367
595	656	21	--	635	600	+ 6	45	173	---	853	+ 42
597	430	3	--	427	200	+114	---	5	---	432	+116
599	793	60	--	733	1,754	- 58	211	295	443	1,682	- 4
600	413	11	--	402	143	+181	136	---	---	538	+276
601	305	18	--	287	1,208	- 76	115	147	186	735	- 39
602	281	12	--	269	695	- 61	78	---	10	357	- 49
603	1,014	3	--	1,011	853	+ 19	320	477	103	1,911	+124
Sub- total	93,501	2,036	2,329	89,136	107,411	- 17	17,191	23,482	16,274	146,083	+ 36
Summary:											
Intense	93,501	2,036	2,329	89,136	107,411	- 17	17,191	23,482	16,274	146,083	+ 36
Less Intense	* 2,708	48	--	2,660	4,082	- 35	252	779	640	4,331	+ 6
Mgt. w/ Pr. Land	* 2,193	68	--	2,125	1,629	+ 30**	355	282	226	2,988	+ 83
Grand Total	98,402	2,152	2,329	93,921	113,122	- 17	17,798	24,543	17,140	153,402	+ 36

* These management levels are the same as proposed action.

** Most of the increased allocation (742 AUM's) in this category is due to the licensing of allotments previously unlicensed.

Appendix Table C-12
Alternative #5 - Proposed Use and 20-Year AUM Projections

			20-Year Projection					
			Un-	Increase due to:				
Allot. No.	Active Preference (Proposed Use)	Over Obli-gation	Untreated Native Range Capacity	Grazing Manage-ment	Brush Control	Brush Control & Seeding	Total	% Increase
Intensive Management								
450	360	--	139	57	148	292	636	+ 77
500	4,478	571	1,171	---	---	2,736	4,478	0
501	1,788	227	566	---	316	679	1,788	0
502	800	371	186	---	101	142	800	0
503	3,344	692	556	---	576	1,520	3,344	0
505	446	--	376	392	---	928	1,696	+280
506	3,547	--	475	---	477	2,818	3,770	+ 6
507	439	147	93	---	9	190	439	0
508	4,274	--	3,691	1,175	1,080	1,372	7,318	+ 71
509	169	--	110	300	---	200	610	+261
513	267	--	262	---	158	103	523	+ 96
514	1,250	--	455	---	58	762	1,275	+ 2
515	1,276	--	486	1,562	1,029	456	3,533	+177
516	1,712	--	742	725	1,108	737	3,312	+ 93
517	4,720	--	3,307	410	1,757	1,401	6,875	+ 46
518	1,459	---	526	556	60	317	1,459	0
519	1,750	--	586	301	200	976	2,063	+ 18
521	1,694	--	839	224	115	1,474	2,652	+ 57
522	651	--	192	---	62	680	934	+ 43
525	886	--	571	---	56	604	1,231	+ 39
526	274	--	173	16	26	388	603	+120
529	726	135	145	---	44	402	726	0
530	180	--	575	40	---	49	664	+269
531	1,699	605	225	---	56	813	1,699	0
532	2,725	--	2,243	1,096	307	112	3,758	+ 38
533	1,609	629	167	---	270	543	1,609	0
534	743	--	102	165	200	340	807	+ 9
535	2,262	--	2,564	41	271	---	2,876	+ 27
536	374	--	160	---	58	247	465	+ 24
539	7,338	--	3,650	---	836	6,255	10,741	+ 46
540	3,726	--	1,911	---	294	1,812	4,017	+ 8
541	4,345	--	2,847	599	520	780	4,746	+ 9
542	87	--	159	---	16	---	175	+101
546	1,020	--	610	227	---	778	1,615	+ 58
548	2,935	--	2,840	964	134	1,035	4,973	+ 69
549	356	--	165	32	11	536	744	+109
550	400	--	362	101	68	373	904	+126
551	1,200	--	845	240	13	1,207	2,305	+ 92
552	139	--	30	11	11	320	372	+168
553	128	--	35	10	---	107	152	+ 19
554	2,412	500	435	---	450	1,027	2,412	0
556	1,532	--	358	956	1,028	363	2,705	+ 77
557	255	--	15	---	---	297	312	+ 22
562	229	--	89	294	55	524	962	+320
563	985	--	459	14	9	535	1,017	+ 3
565	2,410	--	1,127	698	176	1,340	3,341	+ 39
568	113	--	104	154	40	168	466	+312
569	6,329	130	1,626	---	2,255	2,318	6,329	0
570	1,127	--	725	96	426	145	1,392	+ 23
571	1,491	--	1,567	38	765	35	2,405	+ 61
572	212	--	24	---	---	222	246	+ 16
573	2,013	481	324	---	295	913	2,013	0
574	774	648	59	---	34	33	774	0
578	839	199	515	---	110	15	839	0
579	1,463	--	1,046	40	371	433	1,890	+ 29
580	2,378	312	232	---	1,159	675	2,378	0
581	925	--	265	---	353	418	1,036	+ 12
585	1,057	377	669	---	11	---	1,057	0
587	2,271	1,051	467	---	183	570	2,271	0
588	2,710	737	1,312	---	469	192	2,710	0
589	2,103	711	385	---	768	239	2,103	0
590	664	240	61	---	133	230	664	0
593	90	--	226	276	---	---	502	+458
595	600	--	323	24	110	256	713	+ 19
597	200	--	347	---	2	9	358	+ 79
599	1,754	385	429	---	497	443	1,754	0
600	143	--	338	286	6	2	632	+342
601	1,208	574	165	---	114	355	1,208	0
602	695	216	108	---	361	10	695	0
603	853	--	353	337	71	1,004	1,765	+107
Sub-total	107,411	10,494	49,290	11,901	20,696	47,255	139,636	+ 30
Less Intensive Management								
510	56	31	4	---	10	11	56	0
520	1,407	--	716	24	544	242	1,526	+ 8
544	279	91	30	---	---	158	279	0
558	120	--	6	---	13	106	125	+ 4
559	68	35	5	---	13	15	68	0
560	90	--	8	---	12	116	136	+ 51
561	761	--	545	41	235	86	907	+ 19
564	127	--	47	---	11	110	168	+ 32
576	56	--	39	4	30	42	115	+105
586	225	60	13	---	20	132	225	0
591	492	45	87	---	83	277	492	0
592	30	--	6	---	15	9	30	0
594	63	27	12	---	1	23	63	0
596	74	--	14	---	4	106	124	+ 68
598	234	45	60	---	56	73	234	0
Sub-total	4,082	334	1,592	69	1,047	1,506	4,548	+ 11
Management with Private Lands								
453	0	--	1	1	---	---	2	0
454	0	--	8	10	---	---	18	0
455	0	--	2	2	---	---	4	0
456	0	--	31	13	---	---	44	0
457	0	--	--	1	---	---	1	0
458	0	--	27	5	---	---	32	0
459	0	--	204	10	---	---	214	0
461	0	--	8	1	---	---	9	0
463	0	--	1	1	---	---	2	0
464	0	--	1	2	---	---	3	0
465	0	--	8	11	---	---	19	0
466	0	--	112	8	---	---	120	0
467	0	--	20	4	---	---	24	0
469	0	--	2	1	---	---	3	0
470	0	--	0	1	---	---	1	0
571	0	--	3	3	---	---	6	0
472	0	--	2	2	---	---	4	0
473	0	--	11	2	---	---	13	0
476	0	--	25	24	---	---	49	0
477	0	--	6	3	---	---	9	0
479	0	--	4	1	---	---	5	0
483	0	--	0	3	---	---	3	0
485	0	--	4	1	---	---	5	0
486	0	--	1	1	---	---	2	0
487	0	--	87	4	---	---	91	0
491	0	--	35	21	---	---	56	0
492	0	--	2	1	---	---	3	0
504	110	30	4	---	40	36	110	0
511	46	16	17	---	13	---	46	0
515-3	0	--	0	---	---	---	0	0
523	67	--	67	6	---	---	73	+ 9
537	79	--	15	---	53	24	92	+ 16
543	17	--	4	---	13	15	32	+ 88
545	150	--	23	---	12	146	181	+ 21
555	8	--	8	---	---	---	8	0
566	56	2	6	---	5	43	56	0
567	120	--	21	---	---	160	181	+ 51
575	54	--	43	18	5	45	111	+106
577	68	--	156	---	95	18	269	+296
582	43	19	3	---	---	21	43	0
606	54	34	5	---	---	15	54	0
607	75	34	11	---	10	20	75	0
608	114	50	4	---	7	53	114	0
609	42	--	42	9	---	---	51	+ 21
610	0	--	0	---	---	---	0	0
611	35	21	7	---	2	5	35	0
612	24	9	3	---	2	10	24	0
613	63	--	14	---	---	50	64	+ 2
616	69	--	69	32	---	---	101	+ 46
618	0	--	0	---	---	---	0	0
619	63	--	63	36	---	---	99	+ 57
620	0	--	0	---	---	---	0	0
621	0	--	0	---	---	---	0	0
623	32	--	32	18	---	---	50	+ 56
624	61	--	61	26	---	---	87	+ 43
625	76	29	11	---	16	20	76	0
626	39	--	39	---	---	---	39	0
627	64	--	64	42	---	---	106	+ 66
Sub-total	1,629	244	792	187	273	681	2,177	+ 34
Grand Total	113,122	11,072	51,674	12,157	22,016	49,442	146,361	+ 29

Appendix Table D-1

Project Development and Land Treatment

Allot.	Spring	Reser-voirs	Pipe-line	Past Fence	Exclosure Fence Proposed Action	Exclosure Fence Alt. 3	Proposed Action Brush Control	Proposed Action Brush and Seeding	Alternative - 5 Brush Control	Alternative - 5 Brush and Seeding
Intensive Management										
450	--	--	--	--	--	--	546.7	616.5	1,033.3	1,168.4
500	--	8	--	5	2.5	2.5	---	10,942.0	---	10,942.0
501	--	--	--	--	2.0	10.2	2,167.0	2,716.7	2,212.4	2,716.7
502	3	--	--	3	--	3.2	488.6	566.6	704.6	566.6
503	--	--	--	18	--	1.2	7,123.7	454.7	4,030.2	6,078.8
505	--	--	--	--	--	--	---	1,317.0	---	3,713.9
506	2	--	--	8	--	1	7,807.1	1,377.7	3,336.2	11,273.1
507	--	--	--	2	--	--	342.0	228.1	64.6	759.8
508	1	--	6	3	--	3.2	7,547.3	838.6	7,559.5	5,488.2
509	--	--	--	--	--	--	---	285.5	---	799.4
513	--	--	--	3	--	--	1,248.1	203.2	1,109.3	410.4
514	--	4	--	--	--	--	762.2	2,287.5	409.0	3,049.5
515	4	--	--	--	--	1.4	1,536.3	658.4	7,206.7	1,824.4
516	2	2	--	3	--	--	5,389.1	666.1	7,758.1	2,948.2
517	--	5	11	10	--	2.5	12,446.8	3,510.6	12,299.0	5,602.5
518	--	--	--	--	--	--	1,489.3	---	420.4	1,269.1
519	--	11	--	8	--	--	4,073.9	83.0	1,402.1	3,904.2
521	2	1	1	--	--	--	4,314.1	702.3	803.9	5,895.8
522	--	3	--	--	--	--	2,337.7	380.5	431.1	2,718.2
525	1	--	1	4	--	1.4	1,977.2	171.9	392.0	2,417.2
526	--	--	--	--	--	--	267.0	623.1	179.8	1,552.8
529	1	--	--	--	--	--	743.5	289.2	307.6	1,607.5
530	1			2	--	--	---	69.3	---	193.9
531	4	--	2	1	--	--	1,325.6	682.9	388.6	3,251.0
532	1	7	--	3	--	--	1,644.0	446.6	2,149.9	446.6
533	2	1	--	--	--	2.2	1,118.3	1,074.5	1,891.5	2,173.8
534	--	1	--	--	--	1.5	---	1,307.7	1,402.4	1,359.2
535	--	--	--	--	--	--	1,896.3	---	1,896.3	---
536	--	--	--	--	--	--	362.8	425.9	407.8	988.8
539	5	1	--	3	24.3	24.3	22,089.3	4,524.3	5,848.9	25,018.9
540	4	5	--	--	3.7	3.7	5,065.4	1,428.7	2,056.9	7,246.8
541	3	7	--	17	--	4.5	4,791.8	1,957.2	3,642.9	3,121.6
542	--	--	--	--	--	--	110.8	---	110.8	---
546	--	7	--	1	2	2	2,816.4	---	---	3,110.3
548	13	3	--	--	9.6	9.6	610.5	3,210.2	937.9	4,138.4
549	1	2	--	--	--	--	336.5	1,766.4	73.6	2,144.8
550	3	2	--	--	--	--	237.5	1,246.9	476.4	1,491.3
551	10	4	--	--	--	--	786.7	4,130.4	90.3	4,826.9
552	--	--	--	2	--	--	---	654.7	76.2	1,278.8
553	--	--	--	3	--	--	---	121.2	---	427.7
554	9	2	--	6	--	--	3,280.7	---	3,152.0	4,109.5
556	--	1	--	--	--	2.1	1,502.5	166.9	7,196.3	1,451.4
557	1	--	--	--	--	--	---	204.1	---	1,186.2
562	--	--	--	1	--	1.5	---	1,968.4	386.4	2,097.6
563	--	--	--	3	--	--	346.7	170.7	62.6	2,138.2
565	1	3	3	2	--	1.6	5,315.9	164.4	1,230.3	5,360.5
568	--	--	--	1	--	--	505.2	336.8	281.0	673.2
569	--	--	--	11	--	4	15,639.4	823.1	15,788.0	9,273.7
570	--	--	--	--	.2	.2	2,083.3	---	2,981.3	579.8
571	--	--	--	--	--	--	5,006.4	---	5,352.9	138.2
572	--	--	--	--	--	--	---	151.2	---	886.7
573	4	--	--	6	--	--	949.1	2,701.2	2,066.6	3,651.7
574	--	--	--	--	--	--	235.6	130.2	235.6	130.2
578	--	--	--	--	--	--	773.3	60.9	773.3	60.9
579	--	--	--	--	--	2.1	2,663.3	295.9	2,594.9	1,730.7
580	--	--	--	--	1	1	2,562.5	79.3	8,109.7	2,699.8
581	--	--	--	--	--	--	1,493.1	112.4	2,468.7	1,671.5
585	--	--	--	--	--	--	79.3	---	79.3	---
587	3	1	--	2	--	.3	2,070.4	845.7	1,280.2	2,278.1
588	--	--	--	--	--	--	3,488.8	145.4	3,283.0	767.0
589	--	--	--	6	--	--	2,394.8	---	5,376.7	956.8
590	--	--	--	--	--	--	511.6	511.6	927.7	918.3
593	--	1	--	--	1.4	1.4	---	---	---	---

Appendix Table D-1 cont.

Allot.	Spring	Reser-voirs	Pipe-line	Past Fence	Exclosure Fence Proposed Action	Exclosure Fence Alt. 3	Proposed Action Brush Control	Proposed Action Brush and Seeding	Alternative - 5 Brush Control	Alternative - 5 Brush and Seeding
Intensive Management (cont.)										
595	--	--	--	1.0	1.0	5.2	1,210.9	---	768.8	1,022.2
597	--	--	--	--	--	--	33.6	---	15.1	37.0
599	--	--	--	12.0	3.4	3.4	2,062.2	1,771.6	3,480.7	1,771.6
600	--	--	--	--	3.0	3.0	---	---	39.3	8.8
601	--	--	--	--	--	--	1,026.0	742.9	800.6	1,418.5
602	--	--	--	--	--	--	---	41.7	2,526.6	41.7
603	--	8	--	3.0	--	--	3,339.4	412.7	498.6	4,016.6
Subtotal	81	90	24	153	54	102	164,373.5	63,803.2	144,866.4	189,001.9
Less Intensive Management										
510	--	--	--	--	--	--	67.4	44.9	67.4	44.9
520	--	--	--	--	3.9	3.9	2,400.5	491.7	3,808.5	969.1
544	--	--	--	--	--	--	---	227.4	---	633.5
558	--	--	--	--	--	--	319.9	36.0	90.6	425.6
559	--	--	--	--	--	--	91.4	61.0	91.4	61.0
560	--	--	--	--	--	1.3	520.2	---	83.1	464.8
561	--	--	--	--	6.1	6.1	1,001.4	344.9	1,646.7	344.9
564	--	--	--	--	--	--	---	206.1	73.6	439.3
576	--	--	--	--	--	--	93.7	168.6	206.9	168.6
586	--	--	--	--	--	--	518.7	---	140.3	528.4
591	--	--	--	--	--	--	440.7	517.3	578.2	1,108.7
592	--	--	--	--	--	--	---	---	106.2	35.2
594	--	--	--	--	--	--	---	93.5	9.2	93.5
596	--	--	--	--	--	--	---	174.1	28.7	425.7
598	--	--	--	--	--	--	---	196.8	388.9	292.1
Subtotal	0	0	0	0	10	11	5,433.9	2,562.3	7,319.7	6,035.3
Management with Private Lands										
504	--	--	--	--	--	--	144.6	---	279.7	144.6
511	--	--	--	--	--	--	51.0	---	89.2	---
537	--	--	--	--	--	--	160.1	45.2	369.9	96.3
543	--	--	--	--	--	--	89.4	59.6	89.4	59.6
545	--	--	--	--	--	--	470.0	30.0	87.1	582.9
566	--	--	--	--	--	--	198.1	---	36.4	173.1
567	--	--	--	--	--	--	---	224.3	---	641.5
575	--	--	--	--	--	--	169.6	---	35.2	180.5
577	--	--	--	--	--	--	402.9	---	663.9	70.3
582	--	--	--	--	--	--	---	---	---	85.5
606	--	--	--	--	--	--	---	60.1	---	60.1
607	--	--	--	--	--	--	67.3	81.8	67.3	81.8
608	--	--	--	--	--	--	30.1	147.2	46.6	212.8
611	--	--	--	--	--	--	---	18.1	13.2	18.1
612	--	--	--	--	--	--	---	---	12.2	38.2
613	--	--	--	--	--	--	---	191.9	---	198.3
625	--	--	--	--	--	--	66.0	44.9	114.6	78.1
Subtotal	0	0	0	0	0	0	1,849.1	903.1	1,904.7	2,721.7
Grand Total	81	90	24	153	64	113	171,676.5	67,268.6	154,090.8	197.758.9

APPENDIX E
Fence Specifications

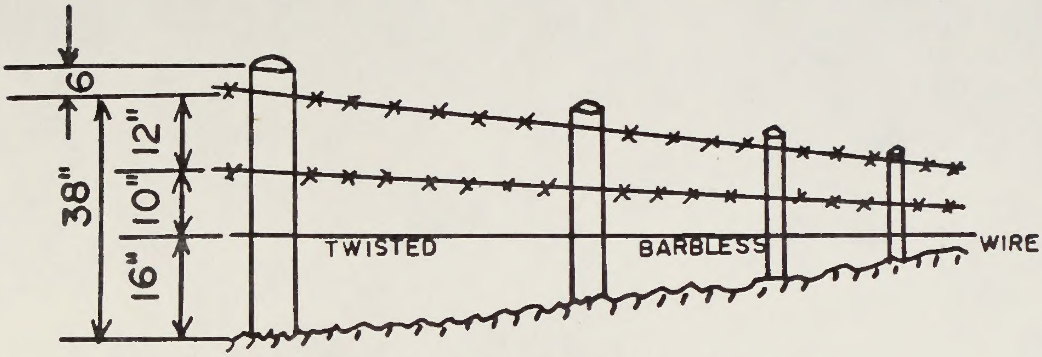


FIGURE-1 ANTELOPE RANGE

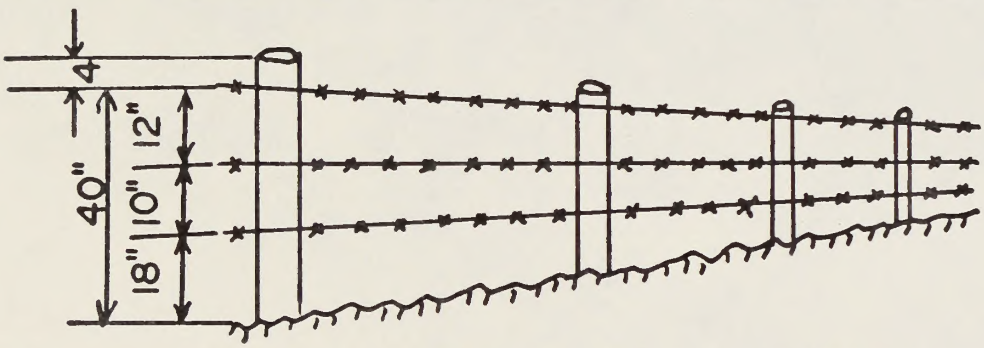


FIGURE-2 MULE DEER RANGE

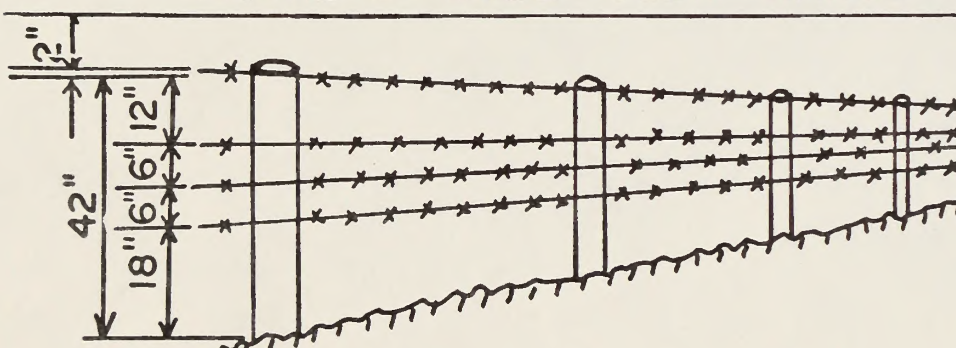


FIGURE-3 MULE DEER RANGE

APPENDIX F

Methodology for the Owyhee EIS Area Vegetation Inventory and Data Analysis

The vegetative portion of the Owyhee EIS Area inventory was conducted from April, 1977 through April, 1979, and consisted of a field inventory and subsequent data analysis. The primary purpose of the inventory and data analysis was to derive production and current range condition data to be used by the area manager in making decisions concerning future range resource management. The following discussion describes the field inventory and data analysis in chronological order. Field forms and BLM Instruction Memos referred to in the narrative are available for inspection at the Boise District Office along with a comprehensive discussion of inventory and analytic methodologies.

Field Inventory

The methods used in the field inventory are described in detail in the National Range Handbook (SCS 1976). The stratification base was defined in terms of soils, soil-vegetation correlations, physiographic features, and climatic characteristics. The soil base for ecological stratification was a range orientated (3rd Order) soil survey conducted in 1977 and 1978. This survey meets the requirements of the National Cooperative Soil Survey Effort. The primary ecological sites stratified are summarized by major ecological component in Appendix Table F-1.

Production cages for utilization studies were placed on the various ecological site strata prior to the 1977 growing season (a total of 220 cages). During the 1977 field season (May 1 - Oct. 15, 1977), complete data on species composition, production plant phenology, soils, topography, etc., were gathered at each production cage site using SCS "double-plot" sampling methods. Data was recorded on SCS Range Data form No. 417 with plant identification following Hitchcock and Cronquist (1973) and plant species abbreviations following SCS Idaho Plant List (1976).

An additional 40 sites were selected for clipping in 1977 to supplement the cage plot data. Every effort was made to select production cage and supplemental plot locations that reflected the range of ecological site condition including reference and relic areas.

A third order soil survey of the area was conducted by the Boise District Soil Survey Crew beginning in 1977. The soil taxonomy of each clipping plot location was described to establish soil-site correlations, which were verified by range conservationist - soil scientist interaction prior to data compilation.

Apparent trend information was collected at each clipping site using BLM form ISO 4400-3. Observations were made on the percent of the total vegetation composed of the potential natural vegetation, plant vigor, seedling establishment, surface litter and soil movement. Each of these factors was given a numerical rating; trend was assigned as downward, static, or upward at each site depending upon the total numerical score.

Additional trend data was compiled through studies of historical vegetal production and composition data collected during range surveys completed in the Owyhee EIS area in the early 1960s.

Shrub species data was collected at each clipping site to serve as a base for wildlife recommendations. Information was gathered according to BLM Instruction Memorandum's No. ID-77-105 (12/31/77) and No. ID-77-105, change No. 2 (3/10/78). The dominant shrub species were characterized by browse condition, age class, plant width, height, and average leader length. In addition, the relative density of the other shrub species at the site was determined and pellet groups for all ungulate species were recorded from belt transects.

The primary effort for the 1978 field season was the determination of range condition for the EIS area. Range condition was determined by comparing existing plant communities with the presumed climax plant community for a specific ecological site, regardless of the value of individual plants or the plant community for specific uses (SCS 1976).

A BLM form (ISO-4400-1) was used to record information on plant species composition, phenology, production, and current erosion using ocular reconnaissance techniques. These forms did not serve as the primary production data base, but rather as the means to extrapolation production data and map vegetal types and condition. Sampling intensities approximated 2 to 3 condition write-ups per section.

Sixty previously clipped cage sites, representing the array of ecological sites, were chosen for re-clipping in 1978. This data along with historical data from outside sources (for example: SCS, SEA, USFS) was used to establish correction factors for production differences associated with the annual variance in precipitation amount and distribution.

A determination of erosion condition class was made at sites clipped in 1978 using BLM form 7310-12. Numerical values were assigned to the soil surface factors including soil movement, surface litter, surface rock, pedestaling, flow patterns, rill and gullies. An erosion condition class of stable, slight, moderate, critical or severe was then assigned to each site on the basis of its total numerical rating.

In addition, information was collected for woodland range types on sites clipped in 1978 using the point sampling basal area method described by Avery (1967). This approach samples trees on the basis of their sizes rather than their frequency of occurrence. The data collected can easily be converted to expressions of density and volume such as canopy cover and trees per acre.

In 1978, an 11.7 foot, circular plot (1/100 acre) was used to collect all shrub data. Average density, canopy cover, height and leader length were recorded and the number of seedlings were counted for each species. This data was gathered in conjunction with the clipping plot transect and was believed to be more useful in characterizing the shrub community at a site than was the 1977 method of data collection. A similar method of collecting shrub data was suggested in the BLM Soil-Vegetation Inventory Methods Draft Manual 1731 (3/1/78).

Every pasture within each allotment was visited during the inventory. A total 333 clipping plot transects were run in the portion of the Owyhee Resource Area inventoried in 1977-78. Range condition write-ups were completed representing 4,250 additional sites which were actually visited during the condition class mapping phase of the inventory.

Data Analysis

The ultimate goal of the data analysis was to provide current range condition and production information which could be readily used in making management decisions.

The methods used in the data analysis process are outlined in chronological order in Instruction Memorandum No. ID-78-85 (3/7/78). Involved in this procedure were several steps which could be briefly summarized as: 1) Correlation of soils data with potential natural plant communities to delineate ecological sites within the inventory area; 2) Calculation of current total air-dry plant production (pounds/acre), the degree of grazing use the plant or plant community can withstand and maintain its vigor, and range suitability criteria. A slightly more detailed description of the analysis follows.

The initial step in the data analysis was the determination of the current productive capabilities within each primary ecological site for each observed condition class (viz. fair, poor, good, excellent - SCS 1976). The details of this process are explained by Burton and Miles (1978). It basically involves aggregating the clipping plot data into ecological sites (potential vegetal types) and then further stratifying into current vegetal types by condition class.

Mean production was next calculated for each vegetation class (i.e., grass, forbs, shrubs) and for the total production. Appropriate standard errors and confidence intervals were calculated using the "Student T Statistic" (alpha = .20 as suggested in original SIM manual).

Once per acre production data had been calculated for each ecological site by condition class, the percentage of each ecological site by condition class within a particular soil mapping unit was calculated. After the acres of each mapping unit were determined on a pasture basis, final forage production was calculated using Automated Data Processing (ADP).

Grazing Suitability

Included in the ecological site descriptive inventory was an assessment of a vegetation area's suitability for grazing. Suitability is defined as the adaptability of an area to grazing by livestock and wildlife (SRM 1974).

A summary of acres unsuitable for livestock grazing by allotment is available upon request.

Appendix Table F-1

Major Ecological Communities and Corresponding Ecological Sites on Public Lands

Ecological Types	EIS Acres	Percent of EIS Area	Corresponding Ecological Sites [1]	Common Species in Climax Communities
Big Sagebrush	365,298	36.0	Loamy 7-10"	Wyoming big sage, Thurber's needlegrass, tapertip hawksbeard, spiney hopsage
			Loamy 10-13"	Wyoming big sage, bluebunch wheatgrass, sandberg bluegrass, lupine
			Loamy 13-16"	mountain big sage, bluebunch wheatgrass, Idaho fescue, lupine
			Loamy Upland 12-16"	basin big sage, bluebunch wheatgrass, Idaho fescue, balsam root
			Loamy 16"+	mountain big sage, Idaho fescue, mountain brome, lupine
Low Sagebrush	325,366	32.0	Very Shallow 10-16" [2]	low sage, bluebunch wheatgrass, sandberg bluegrass, phlox, lupine
			Shallow 10-16" [2]	low sage, Idaho fescue, bluebunch wheatgrass, phlox, lupine
			Shallow 16"+	low sage, Idaho fescue, bluebunch wheatgrass, phlox, lupine
Non-productive	114,167	11.3	Barren, Rock Outcrop	vegetation virtually nonexistent
Salt-desert Shrub	89,289	8.8	Saline Silt 7-10"	nuttal saltbush, saltgrass, squirreltail, saltbrush, phlox
			Deep Saline Silt 7-10"	winterfat, Thurber's needlegrass, basin wild rye, globe mallow
			Sandy Saline Silt 7-10"	four-wing saltbush, Indian ricegrass, globe mallow, basin wild rye
			Calcareous Restrictive 7-10"	shadscale saltbush, bud sage, Indian ricegrass, globe mallow
			Deep Saline Flats 7-10"	black greasewood, needle and threadgrass, saltbrush, globe mallow
			Deep Saline Drainages 7-10"	black greasewood, basin big sage, basin wild rye, squirreltail
Woodland	56,806	5.6	Shallow Breaks 14-18"	western juniper, Idaho fescue, needlegrass, mountain mahogany
			Aspen 16"+	quaking aspen, sedge, bluegrass, mountain brome, snowberry
			Douglas Fir 22"+	Douglas fir, sub-alpine fir, sedge, snowberry, Oregon grape
Brush	27,797	2.7	Mountain Brush 16"+	mountain big sage, ceanothus, snowberry, mountain brome, ribes, cherry, rose
Treated	24,048	2.6	Variable	vegetation common to burns, intermediate wheatgrass, crested wheatgrass
Meadow/ Riparian	9,718	1.0	Semi-Wet Meadow 12-18"	sedge, rush, big bluegrass, iris, cinquefoil, willow
			Wet Meadow 18"+	sedge, big bluegrass, rush, cinquefoil, willow, iris
			Riparian 7-20"	cottonwood, aspen, willow, bluegrass, sedge, rush

1 Ecological site descriptions are available at Boise district office
2 Small areas of the rare Owyhee sagebrush are often associated with these sites.

Appendix Table F-2
Ecological Site Effective Ground Cover (percent)
by Condition Class for Owyhee EIS Area 1/

Ecological Site	Vegetation Type 3/	Poor	Fair	Good	Excellent
Saline Silt 7-10"	ATNU	45	50e	55e	60e
Deep Saline Silt 7-10"	EULA	50	55e	65e	70e
Sandy Saline Silty 7-10"	ATCA	40	40	45e	55e
Deep Saline Flats 7-10"	SAVE	45	50e	50e	55e
Deep Saline Drainages 7-10"	SAVE	60	63	65e	70e
Calcareous Restrictive 7-10"	ATCO	49	49	55	60e
Loamy 7-10"	ARTRW	56	61	70	75e
Loamy 10-13"	ARTRW	60	60	65	70e
Loamy 13-16"	ARTRV	64	69	79	82
Loamy Upland 12-16"	ARTRT	55	65	75	80e
Loamy 16" +	ARTRV	68	70	75	86
Shallow 10-16"	ARAR	63	70	75	75e
Shallow 16" +	ARAR	52	62	71	80e
Shallow Breaks 14-18 2/	JUOC	60	65	65	70e
Aspen 16" + 2/	POTR	65	70e	85e	100e
Douglas Fir 22" + 2/	PSME	70	75e	85e	100e
Mountain Brush 16" +	Misc.	74	81	87	98
Mountain Mahogany 14"+ 2/	CELE	60	65	65	70e
Meadow/Riparian	Misc.	75	75	85	95e

1/ Data collected by step-point transects
e = Estimates values using previously developed site guides, Owyhee Resource Area exclosure and "relic" area studies.

2/ Includes overstory plus understory effective ground cover.

3/ See Appendix F-1 for further description of vegetation.

Appendix Table F-3

Threatened, Endangered and Uncommon Plants
Present in the EIS Area

I. ENDANGERED PLANTS

Artemesia (packardiae)
Astragalus steriles
Astragalus purshii var. ophiogenes
Erigeron disparipilus
Erigeron latus
Lepidium davisii
Penstemon perpulcher
Primula cusickii
Lupinus uncialis

II. THREATENED PLANTS

Artemisia papposa
Astragalus camptopus
Astragalus iodanthus vipereus
Cryptantha propria
Dimersia howellii
Draba douglasii
Eriogonum ochrocephalum sceptrum
Eriogonum shockleyi (packardae) in edit
Ivesia baileyi
Lupinus yallii subsp. subpandens
Mentzelia mollis
Pediocactus simpsonii var. robustior
Phacelia minutissima
Rhysopterus plurijugas
Trifolium owyheensis

III. UNCOMMON PLANTS

Artemisia longiloba
Eatonella nivea
Eriogonum salicornoides
Glossopetalon nevadense
Gymnosteris nudicalius
Langloisia puncata
Malacothrix rigidus
Pinus flexilis
Gymnosteris parvula

Appendix Table F-4

Present Condition Class for Public Lands

Allot #	POOR	FAIR	GOOD	EXCELLENT	Treated[1/]	TOTAL
Intensive Management - Acres						
0450	1,356.6	2,666.8				4,023.4
0500	16,528.7	2,332.6	2,697.9		6981.2-SP	28,540.4
0501	14,705.3	3,107.4	328.0			18,140.7
0502	2,650.2	1,254.4				3,904.6
0503	15,751.2	1,258.6	256.0			17,265.8
0505	4,383.0	1,752.4				6,135.4
0506	18,541.8	3,112.6	354.5			22,008.9
0507	1,049.0	147.9			735.8-B,S	1,932.7
0508	15,709.1	18,034.2	5,558.8	347.0		39,649.1
0509		1,400.0	110.0		67.0-B,S	1,577.0
0513	10,069.0					10,069.0
0514		5,641.6	414.0	302.3		6,357.9
0515[2/]	742.0	10,498.3	18.0		1754.0-S	13,012.3
0516	7,984.9	6,781.5	1,842.0			16,608.4
0517	57,361.0	8,346.4	1,796.6			67,504.0
0518		2,890.0	270.9		1466.0-S	4,626.9
0519	9,359.8	2,063.7				11,423.5
0521	6,611.3	4,813.5		402.0	2089.0-B,S	13,915.8
0522	4,403.0	1,134.0				5,537.0
0525	3,429.0	1,050.5	1,192.0	1234.0	294.0-B	7,199.5
0526	1,169.0	4,343.3	158.0			5,670.3
0529	1,818.2	1,454.0	124.0			3,396.2
0530	277.0		60.0		1204.0-B	1,541.0
0531	4,039.9	1,002.0	23.0		734.0-S	5,798.9
0532	13,364.5	12,332.2				25,696.7
0533	3,232.0	2,863.0	10.0			6,105.0
0534	1,505.0	2,161.0				3,666.0
0535	38,692.0	12,029.0				50,721.0
0536	3,204.0	934.5				4,138.5
0539	48,286.5	45,743.5	4,729.6		84.0-SP	98,843.6
0540	13,099.5	28,234.6	3,068.7			44,402.8
0541	14,921.0	19,098.0	4,942.0			38,961.0
0542	534.5	9.0	231.0		863.0-SP	1,637.5
0546	10,900.8	2,334.7	685.4			13,920.9
0548	14,327.6	17,556.2	2,646.0			34,529.8
0549	3,957.4	1,070.8				5,028.2
0550	5,636.7	2,834.3				8,471.0
0551	9,588.0	8,681.1	2,429.4			20,698.5
0552	1,776.0					1,776.0
0553	622.8	35.0				657.8
0554	14,052.5	1,441.0	259.0			15,752.5
0556	4,303.6	6,432.9	109.1			10,845.6
0557	1,339.6	104.0				1,443.6
0562	1,255.7	2,088.7	54.0		18.0-B	3,416.4
0563	2,486.7	330.0	1,700.0		153.0-B	4,669.7
0565	3,800.6	5,779.2			3946.6-S,B	13,526.4
0568	3,383.5					3,383.5
0569	34,590.3	11,610.9	2,035.0			48,236.2
0570	1,919.0	5,318.5	1,405.8			8,643.3
0571	22,164.6	7,005.0	232.0			29,401.6
0572	1,045.7	42.4				1,088.1
0573	3,444.5	6,087.8				9,532.3
0574	2,610.2	25.4				2,635.6
0578	9,139.1	718.0				9,857.1
0579	6,628.8	1,051.0			3741.0-S	11,420.8
0580	9,263.6	4,765.5	323.8			14,352.7
0581	7,182.5	279.0			282.0-B	7,743.5
0585	625.0	1,977.0			1506.3-S	4,108.3
0587	3,458.3	6,677.0	64.0			10,199.3
0588	9,810.2	3,234.8	1,323.0			14,368.0
0589	5,803.0	2,150.2	2,977.8			10,931.0
0590	826.0	1,199.4	487.4			2,512.8
0593		3,206.5	460.8			3,667.3
0595	69.0	4,037.0	262.0			4,368.0
0597	124.7	14.4	1,496.4			1,635.5
0599	11,500.0	3,461.1				14,961.1
0600		1,425.0	1,210.0			2,635.0
0601	5,212.8	1,111.0				6,323.8
0602	2,167.0	2,598.7				4,765.7
0603	3,093.6	4,666.1				7,759.7
Subtotal	552,889.4	329,837.8	48,345.9	2,285.3	25,918.9	959,277.4
Less Intensive Management - Acres						
0510	435.0	14.0				449.0
0520	2,204.2	7,870.0	1,457.6	364.4		11,896.2
0544	155.6	759.4				915.0
0558	608.0				52.0-S	660.0
0559	609.6					609.6
0560	653.1	41.0	7.0			701.1
0561	1,237.1	4,231.3	474.0			5,942.4
0564		908.2	115.4			1,023.6
0576	553.0	357.6	234.2			1,144.8
0586	487.0	363.0				850.0
0591	2,569.0	1,357.7	54.1			3,980.8
0592	253.0	20.0				273.0

Appendix Table F-4 cont.

Allot #	POOR	FAIR	GOOD	EXCELLENT	Treated[1/]	TOTAL
0594		216.0				216.0
0596	379.3	392.8				772.1
0598	2,638.7	368.2				3,006.9
Subtotal	12,782.6	16,899.2	2,342.3	364.4	52.0	32,440.5
Management With Private Lands - Acres						
0453	70.0					70.0
0454	398.0					398.0
0455	120.0					120.0
0456	986.0					986.0
0457	25.0					25.0
0458	71.0	437.8				508.8
0459	5.4	753.0				758.4
0461	17.9	74.5				92.4
0463	35.0					35.0
0464	38.0					38.0
0465	448.8					448.8
0466	709.0	68.2				777.2
0467	33.0	87.0				120.0
0469	67.0					67.0
0470	20.0					20.0
0471		28.0				28.0
0472	51.0					51.0
0473	95.0	33.0				128.0
0476		158.0				158.0
0477	94.0	14.0				108.0
0479	35.0	6.0				41.0
0483	60.0					60.0
0485	59.4	6.0				65.4
0486	108.0					108.0
0487	45.0	458.0				503.0
0491		504.6				504.6
0492	40.0					40.0
0504	525.0					525.0
0511		103.6	149.4			253.0
0515[3/]		29.0	214.0			243.0
0523	8.0	482.8				490.8
0524						
0537	820.0					820.0
0543	596.0					596.0
0545	718.0	79.6	132.0		77.0-S	1,006.6
0555	120.0					120.0
0566	434.5					434.5
0567	99.1	817.3				916.4
0575	149.3	601.7				751.0
0577		1,604.5				1,604.5
0582	190.0					190.0
0606	27.0	123.0				150.0
0607	133.9	171.0				304.9
0608	395.0	14.0				409.0
0609	215.6	261.3				476.9
0610	183.0					183.0
0611	231.0	125.9				356.9
0612	59.0	38.0				97.0
0613	284.0	222.0				506.0
0616	120.0	758.0	117.0			995.0
0618	48.0	449.2				497.2
0619	50.0	227.0	358.0			635.0
0620		160.0				160.0
0621	91.0	76.0				167.0
0623	145.7	195.0				340.7
0624		585.0	10.0			595.0
0625	794.0	75.0				869.0
0626	183.0	158.0	28.0	47.0		416.0
0627		750.0	459.3			1,209.3
Subtotal	10,251.6	10,735.0	1,467.7	47.0	77.0	22,578.3
TOTAL	575,923.6	357,472.1	52,155.9	2,696.7	26,047.9	1,014,296.2
PERCENT	56.8	35.2	5.1	0.3	2.6	100.0

1/ S = Seed, SP = Spray, B= Burn

2/ Pastures 1 and 2 only.

3/ Pasture 3 only.

Appendix Table F-5
Present Trend on Public Lands

Allotment Number	Trend Acres: Downward	Static or Non-Apparent	Upward	Total
Intensive Management				
0450	1,356.6	2,002.1	664.7	4,023.4
0500	21,897.2	3,945.3	2,697.9	28,540.4
0501	16,481.3	1,659.4		18,140.7
0502	662.6	3,242.0		3,904.6
0503	6,397.5	10,612.3	256.0	17,265.8
0505	4,471.1	1,664.3		6,135.4
0506	18,236.7	2,349.6	1,422.6	22,008.9
0507	1,049.0	883.7		1,932.7
0508	13,909.5	9,026.4	16,713.2	39,649.1
0509		822.0	755.0	1,577.0
0513	10,069.0			10,069.0
0514	5,077.4	1,280.5		6,357.9
0515 1/	742.0	2,561.8	9,708.5	13,012.3
0516	8,365.9	2,215.0	6,027.5	16,608.4
0517	61,114.0	4,929.6	1,460.4	67,504.0
0518		4,626.9		4,626.9
0519	9,359.8	2,063.7		11,423.5
0521	6,611.3	7,304.5		13,915.8
0522	4,416.4	1,120.6		5,537.0
0525	3,429.0	3,770.5		7,199.5
0526	670.9	4,999.4		5,670.3
0529	3,272.2	124.0		3,396.2
0530	277.0	1,264.0		1,541.0
0531	5,798.9			5,798.9
0532	7,680.0	18,016.7		25,696.7
0533	1,616.0	4,489.0		6,105.0
0534	556.5	3,109.5		3,666.0
0535	38,692.0	3,608.7	8,420.3	50,721.0
0536	3,671.2	467.3		4,138.5
0539	62,531.8	36,311.8		98,843.6
0540	31,777.4	12,625.4		44,402.8
0541	7,460.5	26,558.5	4,942.0	38,961.0
0542	543.5	1,094.0		1,637.5
0546	10,900.8	3,020.1		13,920.9
0548	21,408.0	10,475.8	2,646.0	34,529.8
0549	3,957.4	1,070.8		5,028.2
0550	5,636.7	2,834.3		8,471.0
0551	9,588.0	11,110.5		20,698.5
0552	1,766.0			1,766.0
0553	657.8			657.8
0554	13,573.5	2,179.0		15,752.5
0556	4,332.5	4,353.1	2,160.0	10,845.6
0557	1,443.6			1,443.6
0562	1,255.7	2,106.7	54.0	3,416.4
0563	2,486.7	483.0	1,700.0	4,669.7
0565	6,240.3	7,286.1		13,526.4
0568	3,383.5			3,383.5
0569	7,040.0	35,436.2	5,760.0	48,236.2
0570	573.0	2,940.4	5,129.9	8,643.3
0571	22,164.6	7,132.0	105.0	29,401.6
0572	1,045.7	42.4		1,088.1
0573		9,532.3		9,532.3
0574		2,635.6		2,635.6
0578	9,139.1	718.0		9,857.1
0579	5,303.0	6,117.8		11,420.8
0580	6,672.7	7,680.0		14,352.7
0581	7,182.5	561.0		7,743.5
0585	3,119.8	988.5		4,108.3
0587	2,597.2	7,527.1	75.0	10,199.3
0588	9,810.2	3,234.8	1,323.0	14,368.0
0589	5,803.0	5,128.0		10,931.0
0590	826.0	1,686.8		2,512.8
0593		3,206.5	460.8	3,667.3
0595	1,280.1	3,087.9		4,368.0
0597	124.7	463.3	1,047.5	1,635.5
0599	3,117.0	11,844.1		14,961.1
0600		1,788.0	847.0	2,635.0
0601	2,520.0	3,803.8		6,323.8
0602	2,167.0	2,598.7		4,765.7
0603	3,093.6	4,666.1		7,759.7
Subtotal	538,413.9	346,622.2	74,241.3	959,277.4
Less Intensive Management				
0510	435.0	14.0		449.0
0520	2,204.2	9,692.0		11,896.2
0544		915.0		915.0
0558	608.0	52.0		660.0
0559	609.6			609.6
0560	653.1	48.0		701.1
0561	1,237.1	4,705.3		5,942.4
0564	102.3	921.3		1,023.6
0576	553.0	591.8		1,144.8
0586	487.0	363.0		850.0
0591	2,569.0	1,411.8		3,980.8
0592	253.0	20.0		273.0
0594		216.0		216.0
0596	379.3	392.8		772.1
0598	2,405.5	601.4		3,006.9
Subtotal	12,496.1	19,944.4	0.0	32,440.5
Management with Private Lands				
0453	70.0			70.0
0454	398.0			398.0
0455	120.0			120.0
0456	986.0			986.0
0457	25.0			25.0
0458		443.1	65.7	508.8
0459		758.4		758.4
0461		92.4		92.4
0463	35.0			35.0
0464	38.0			38.0
0465	68.1	380.7		448.8
0466	777.2			777.2
0467	77.0	43.0		120.0
0469	67.0			67.0
0470	20.0			20.0
0471		28.0		28.0
0472	51.0			51.0
0473	128.0			128.0
0476			158.0	158.0
0477	94.0	14.0		108.0
0479	24.0	17.0		41.0
0483		60.0		60.0
0485	65.4			65.4
0486	108.0			108.0
0487		503.0		503.0
0491		504.6		504.6
0492	40.0			40.0
0504	210.0	315.0		525.0
0511		253.0		253.0
0515 2/		123.0	120.0	243.0
0523			490.8	490.8
0537	820.0			820.0
0543	596.0			596.0
0545	718.0	156.6	132.0	1,006.6
0555	120.0			120.0
0566	434.5			434.5
0567	99.1	817.3		916.4
0575		751.0		751.0
0577		1,604.5		1,604.5
0582	190.0			190.0
0606	150.0			150.0
0607	304.9			304.9
0608	409.0			409.0
0609	101.3	375.6		476.9
0610	183.0			183.0
0611	231.0	125.9		356.9
0612	97.0			97.0
0613	284.0	222.0		506.0
0616	120.0	331.0	544.0	995.0
0618	48.0	449.2		497.2
0619	50.0	354.0	231.0	635.0
0620		100.0	60.0	160.0
0621	40.0	127.0		167.0
0623	80.0	205.7	55.0	340.7
0624		300.0	295.0	595.0
0625	794.0	75.0		869.0
0626	183.0	233.0		416.0
0627		907.0	302.3	1,209.3
Subtotal	9,454.5	10,670.0	2,453.8	22,578.3
TOTAL	560,364.5	377,236.6	76,695.1	1,014,296.2
PERCENT	55.2%	37.2%	7.6%	100.0%

1/ Pastures 1 and 2 only.

2/ Pasture 3 only.

Appendix Table F-6
Proposed Action - Condition Class in 20 Years

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management - Acres						
450	193.4	1,341.8	1,325.0	---	1,163.2	4,023.4
500	10,955.2	3,945.3	2,697.9	---	10,942.0	28,540.4
501	8,763.2	4,165.8	328.0	---	4,883.7	18,140.7
502	95.0	2,354.4	400.0	---	1,055.2	3,904.6
503	5,814.6	3,616.8	256.0	---	7,578.4	17,265.8
505	2,858.0	553.0	1,407.4	---	1,317.0	6,135.4
506	3,580.9	7,466.1	1,777.1	---	9,184.8	22,008.9
507	---	479.0	147.8	---	1,305.9	1,932.7
508	5,523.6	3,120.6	20,272.0	2,347.0	8,385.9	39,649.1
509	---	---	1,224.5	---	352.5	1,599.0
513	8,617.7	---	---	---	1,451.3	10,069.0
514	---	2,591.9	414.0	302.3	3,049.7	6,357.9
515	---	944.3	8,119.3	---	3,948.7	13,012.3
516	---	2,683.7	7,869.5	---	6,055.2	16,608.4
517	37,166.6	12,000.0	2,380.0	---	15,957.4	67,504.0
518	---	190.0	1,481.6	---	2,955.3	4,626.9
519	2,367.6	3,127.0	1,772.0	---	4,156.9	11,423.5
521	60.9	1,534.0	4,813.5	402.0	7,105.4	13,915.8
522	1,684.8	1,134.0	---	---	2,718.2	5,537.0
525	1,279.9	1,050.5	1,192.0	1,234.0	2,443.1	7,199.5
526	---	3,745.0	1,035.2	---	890.1	5,690.3
529	513.5	1,726.0	124.0	---	1,032.7	3,396.2
530	---	207.7	60.0	---	1,273.3	1,541.0
531	1,547.4	2,220.0	23.0	---	2,008.5	5,798.9
532	5,589.4	12,195.5	5,821.2	---	2,090.6	25,696.7
533	800.0	1,273.2	1,839.0	---	2,192.8	6,105.0
534	---	853.3	1,505.0	---	1,307.7	3,666.0
535	31,795.7	8,608.7	8,420.3	---	1,896.3	50,721.0
536	1,047.3	1,835.2	467.3	---	788.7	4,138.5
539	21,672.9	29,994.4	20,478.7	---	26,697.6	98,843.6
540	6,605.4	18,060.3	13,243.0	---	6,494.1	44,402.8
541	3,460.5	10,530.2	13,279.3	4,942.0	6,749.0	38,961.0
542	300.0	132.7	231.0	---	973.8	1,637.5
546	2,784.4	5,300.0	3,020.1	---	2,816.4	13,920.9
548	7,463.4	9,273.3	13,664.4	308.0	3,820.7	34,529.8
549	1,161.6	1,565.5	198.2	---	2,102.9	5,028.2
550	2,740.0	4,074.2	172.4	---	1,484.4	8,471.0
551	2,175.0	7,613.8	5,992.6	---	4,917.1	20,698.5
552	931.3	190.0	---	---	654.7	1,776.0
553	458.8	77.8	---	---	121.2	657.8
554	6,455.8	4,951.0	1,065.0	---	3,280.7	15,752.5
556	2,634.2	4,382.0	2,050.9	109.1	1,669.4	10,845.6
557	1,135.5	104.0	---	---	204.1	1,443.6

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management (cont.)						
562	---	---	1,430.0	---	1,986.4	3,416.4
563	1,769.3	530.0	800.0	900.0	670.4	4,669.7
565	---	976.5	3,123.0	---	9,426.9	13,526.4
568	1,419.5	1,122.0	---	---	842.0	3,383.5
569	17,406.8	9,636.9	3,695.0	1,035.0	16,462.5	48,236.2
570	---	2,128.2	3,026.0	1,405.8	2,083.3	8,643.3
571	17,158.2	7,005.0	232.0	---	5,006.4	29,401.6
572	894.5	42.4	---	---	151.2	1,088.1
573	---	2,578.9	3,303.1	---	3,650.3	9,532.3
574	513.1	1,731.3	25.4	---	365.8	2,635.6
578	8,304.9	718.0	---	---	834.2	9,857.1
579	2,992.5	1,728.0	---	---	6,700.3	11,420.8
580	3,607.5	5,258.5	2,844.8	---	2,641.8	14,352.7
581	3,509.0	2,347.0	---	---	1,887.5	7,743.5
585	545.7	1,977.0	---	---	1,585.6	4,108.3
587	---	5,381.2	1,902.0	---	2,916.1	10,199.3
588	2,680.8	6,086.0	1,967.0	---	3,634.2	14,368.0
589	902.2	3,506.0	4,128.0	---	2,394.8	10,931.0
590	---	---	1,489.6	---	1,023.2	2,512.8
593	---	1,206.5	2,460.8	---	---	3,667.3
595	---	1,941.1	1,216.0	---	1,210.9	4,368.0
597	40.8	64.7	1,496.4	---	33.6	1,635.5
599	1,885.2	9,242.1	---	---	3,833.8	14,961.1
600	---	159.0	2,476.0	---	---	2,635.0
601	979.5	3,575.4	---	---	1,768.9	6,323.8
602	1,911.3	1,312.7	1,500.0	---	41.7	4,765.7
603	993.6	1,686.0	1,328.0	---	3,752.1	7,759.7
Sub-total	257,748.0	253,152.4	189,011.3	12,985.2	246,380.5	959,277.4
Less Intensive Management - Acres						
510	211.7	111.0	14.0	---	112.3	449.0
520	566.8	5,040.4	2,836.8	560.0	2,892.2	11,896.2
544	---	459.9	227.7	---	227.4	915.0
558	---	304.1	---	---	355.9	660.0
559	257.2	200.0	---	---	152.4	609.6
560	---	132.9	48.0	---	520.2	701.1
561	---	2,726.1	1,870.0	---	1,346.3	5,942.4
564	---	299.5	518.0	---	206.1	1,023.6
576	114.7	483.6	284.2	---	262.3	1,144.8
586	---	281.3	50.0	---	518.7	850.0
591	763.0	1,757.9	501.9	---	958.0	3,980.0
592	128.0	135.0	10.0	---	---	273.0

Appendix Table F-6 Cont.

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Less Intensive Management (cont.)						
594	---	57.5	65.0	---	93.5	216.0
596	91.4	377.6	129.0	---	174.1	772.1
598	1,968.2	841.9	---	---	196.8	3,006.9
Sub-total	4,101.0	13,208.7	6,554.6	560.0	8,016.2	32,440.5
Management with Private Lands - Acres						
453	50.0	20.0	---	---	---	70.0
454	279.0	119.0	---	---	---	398.0
455	80.0	40.0	---	---	---	120.0
456	658.0	328.0	---	---	---	986.0
457	17.0	8.0	---	---	---	25.0
458	50.0	355.9	102.9	---	---	508.8
459	---	708.4	50.0	---	---	758.4
461	---	92.4	---	---	---	92.4
463	20.0	15.0	---	---	---	35.0
464	21.0	17.0	---	---	---	38.0
465	273.1	175.7	---	---	---	448.8
466	609.0	168.2	---	---	---	777.2
467	13.0	107.0	---	---	---	120.0
469	57.0	10.0	---	---	---	67.0
470	7.0	13.0	---	---	---	20.0
471	---	19.0	9.0	---	---	28.0
472	30.0	21.0	---	---	---	51.0
473	75.0	53.0	---	---	---	128.0
476	---	48.0	110.0	---	---	158.0
477	63.0	45.0	---	---	---	108.0
479	---	24.0	17.0	---	---	41.0
483	25.0	35.0	---	---	---	60.0
485	49.4	16.0	---	---	---	65.4
486	90.0	18.0	---	---	---	108.0
487	20.0	458.0	25.0	---	---	503.0
491	---	373.6	131.0	---	---	504.6
492	30.0	10.0	---	---	---	40.0
504	65.4	315.0	---	---	144.6	525.0
511	---	37.6	164.4	---	51.0	253.0
515-3	---	29.0	94.0	120.0	---	243.0
523	---	8.0	482.8	---	---	490.8
537	484.7	130.0	---	---	205.3	820.0
543	268.2	178.8	---	---	149.0	596.0
545	52.1	165.9	79.6	132.0	577.0	1,006.6
555	75.0	45.0	---	---	---	120.0
Management with Private Lands (cont.)						
566	---	236.4	---	---	198.1	434.5
567	---	406.1	286.0	---	224.3	916.4
575	---	397.8	183.6	---	169.6	751.0
577	---	1,161.6	40.0	---	402.9	1,604.5
582	175.0	15.0	---	---	---	190.0
606	---	89.9	21.0	---	60.1	150.0
607	---	134.8	---	---	149.1	304.9
608	187.7	44.0	---	---	177.3	409.0
609	124.7	334.1	---	---	18.1	476.9
610	148.0	35.0	---	---	---	183.0
611	198.0	158.9	---	---	---	356.9
612	51.0	46.0	---	---	---	97.0
613	39.1	275.0	---	---	191.9	506.0
616	100.0	351.0	427.0	117.0	---	995.0
618	38.0	459.2	---	---	---	497.2
619	35.0	235.0	134.0	231.0	---	635.0
620	---	75.0	85.0	---	---	160.0
621	40.0	127.0	---	---	---	167.0
623	62.7	223.0	55.0	---	---	340.7
624	---	350.0	235.0	10.0	---	595.0
625	415.1	343.0	---	---	110.9	869.0
626	183.0	158.0	28.0	--47.0	---	416.0
627	---	508.2	701.1	---	---	1,209.3
Sub-total	5,259.2	10,371.5	3,461.4	657.0	2,829.2	22,578.3
Grand Total	267,108.2	276,732.6	199,027.3	14,092.2	257,225.9	1,014,296.2
PERCENT	26.3	27.3	19.6	1.4	25.4	100.0

Appendix Table F-7

Alternative #1 - Condition Class in 20 Years

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management - Acres						
450	1,356.6	2,002.1	664.7	---	---	4,023.4
500	19,604.3	2,332.6	---	2,697.9	3,905.6	28,540.4
501	14,707.3	3,105.4	328.0	---	---	18,140.7
502	2,650.2	1,254.4	---	---	---	3,904.6
503	15,751.2	1,258.6	---	256.0	---	17,265.8
505	4,383.0	1,752.4	---	---	---	6,135.4
506	18,541.8	1,690.0	1,777.1	---	---	22,008.9
507	1,170.4	147.9	---	---	614.4	1,932.7
508	12,519.4	4,510.7	22,272.0	347.0	---	39,649.1
509	11.1	712.0	731.0	67.0	55.9	1,577.0
513	10,069.0	---	---	---	---	10,069.0
514	---	5,641.6	414.0	302.3	---	6,357.9
515	1,031.4	789.8	9,726.5	---	1,464.6	13,012.3
516	7,186.4	1,552.5	7,869.5	---	---	16,608.4
517	51,624.9	13,499.1	1,503.0	877.0	---	67,504.0
518	241.9	2,890.0	270.9	---	1,224.1	4,626.9
519	9,359.8	2,063.7	---	---	---	11,423.5
521	6,294.9	5,474.6	---	402.0	1,744.3	13,915.8
522	4,416.4	1,120.6	---	---	---	5,537.0
525	3,478.0	1,050.5	1,192.0	1,234.0	245.0	7,199.5
526	1,169.0	4,343.3	158.0	---	---	5,670.3
529	1,818.2	1,454.0	124.0	---	---	3,396.2
530	475.7	---	60.0	---	1,005.3	1,541.0
531	4,161.0	1,002.0	23.0	---	612.9	5,798.9
532	13,364.5	12,332.2	---	---	---	25,696.7
533	3,232.0	2,863.0	10.0	---	---	6,105.0
534	1,505.0	2,161.0	---	---	---	3,666.0
535	38,692.0	3,608.7	8,420.3	---	---	50,721.0
536	3,204.0	934.5	---	---	---	4,138.5
539	48,300.3	45,743.5	4,729.6	---	70.2	98,843.6
540	13,099.5	28,234.6	3,068.7	---	---	44,402.8
541	14,921.0	19,098.0	---	4,942.0	---	38,961.0
542	676.9	9.0	231.0	---	720.6	1,637.5
546	10,900.8	2,334.7	685.4	---	---	13,920.9
548	14,327.6	17,556.2	---	2,646.0	---	34,529.8
549	3,957.4	1,070.8	---	---	---	5,028.2
550	5,636.7	2,834.3	---	---	---	8,471.0
551	9,588.0	8,681.1	2,429.4	---	---	20,698.5
552	1,776.0	---	---	---	---	1,776.0
553	622.8	35.0	---	---	---	657.8
554	14,052.5	1,441.0	259.0	---	---	15,752.5
556	3,873.2	4,812.4	2,050.9	109.1	---	10,845.6
557	1,339.6	104.0	---	---	---	1,443.6
562	1,258.7	2,088.7	---	54.0	15.0	3,416.4
563	2,512.7	330.0	---	1,700.0	127.0	4,669.7
565	4,451.9	5,779.2	---	---	3,295.3	13,526.4

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management (cont.)						
568	3,383.5	---	---	---	---	3,383.5
569	34,590.3	7,915.9	3,695.0	2,035.0	---	48,236.2
570	1,919.0	1,594.4	3,724.1	1,405.8	---	8,643.3
571	22,164.6	7,005.0	232.0	---	---	29,401.6
572	1,045.7	42.4	---	---	---	1,088.1
573	3,444.5	6,087.8	---	---	---	9,532.3
574	2,610.2	25.4	---	---	---	2,635.6
578	9,139.1	718.0	---	---	---	9,857.1
579	7,246.1	1,051.0	---	---	3,123.7	11,420.8
580	9,263.6	4,765.3	323.8	---	---	14,352.7
581	7,229.0	279.0	---	---	235.5	7,743.5
585	1,342.9	1,977.0	---	---	788.4	4,108.3
587	3,458.3	6,666.0	11.0	64.0	---	10,199.3
588	9,810.2	3,234.8	---	1,323.0	---	14,368.0
589	5,803.0	2,150.2	2,977.8	---	---	10,931.0
590	826.0	1,199.4	487.4	---	---	2,512.8
593	---	3,206.5	---	460.8	---	3,667.3
595	69.0	4,037.0	262.0	---	---	4,368.0
597	124.7	14.4	448.9	1,047.5	---	1,635.5
599	11,500.0	3,461.1	---	---	---	14,961.1
600	---	1,425.0	363.0	847.0	---	2,635.0
601	5,212.8	1,111.0	---	---	---	6,323.8
602	2,167.0	2,598.7	---	---	---	4,765.7
603	3,093.6	4,666.1	---	---	---	7,759.7
Sub-total	548,748.1	286,931.1	81,523.0	22,817.4	19,247.8	959,277.4
Less Intensive Management - Acres						
510	435.0	14.0	---	---	---	449.0
520	2,568.6	7,870.0	1,457.6	364.4	---	11,896.2
544	155.6	759.4	---	---	---	915.0
558	608.0	---	---	---	52.0	660.0
559	609.6	---	---	---	---	609.6
560	653.1	41.0	7.0	---	---	701.1
561	1,237.1	4,231.3	474.0	---	---	5,942.4
564	---	908.2	115.4	---	---	1,023.6
576	553.0	357.6	234.2	---	---	1,144.8
586	487.0	363.0	---	---	---	850.0
591	2,569.0	1,357.7	54.1	---	---	3,980.8
592	253.0	20.0	---	---	---	273.0
594	---	216.0	---	---	---	216.0
596	379.3	392.8	---	---	---	772.1
598	2,638.7	368.2	---	---	---	3,006.9
Sub-total	12,782.6	16,899.2	2,342.3	364.4	52.0	32,440.5

Appendix Table F-7 cont.

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Management with Private Land - Acres						
453	70.0	---	---	---	---	70.0
454	398.0	---	---	---	---	398.0
455	120.0	---	---	---	---	120.0
456	986.0	---	---	---	---	986.0
457	25.0	---	---	---	---	25.0
458	71.0	372.1	65.7	---	---	508.8
459	5.4	753.0	---	---	---	758.4
461	17.9	74.5	---	---	---	92.4
463	35.0	---	---	---	---	35.0
464	38.0	---	---	---	---	38.0
465	448.8	---	---	---	---	448.8
466	709.0	68.2	---	---	---	777.2
467	33.0	87.0	---	---	---	120.0
469	67.0	---	---	---	---	67.0
470	20.0	---	---	---	---	20.0
471	---	28.0	---	---	---	28.0
472	51.0	---	---	---	---	51.0
473	95.0	33.0	---	---	---	128.0
476	---	---	158.0	---	---	158.0
477	94.0	14.0	---	---	---	108.0
479	35.0	6.0	---	---	---	41.0
483	60.0	---	---	---	---	60.0
485	59.4	6.0	---	---	---	65.4
486	108.0	---	---	---	---	108.0
487	45.0	458.0	---	---	---	503.0
491	---	504.6	---	---	---	504.6
492	40.0	---	---	---	---	40.0
504	525.0	---	---	---	---	525.0
511	---	103.6	149.4	---	---	253.0
515-3	---	29.0	94.0	120.0	---	243.0
523	---	8.0	482.8	---	---	490.8
537	820.0	---	---	---	---	820.0
543	596.0	---	---	---	---	596.0
545	718.0	79.6	---	132.0	77.0	1,006.6
555	120.0	---	---	---	---	120.0
566	434.5	---	---	---	---	434.5
567	99.1	817.3	---	---	---	916.4
575	---	601.7	---	---	---	751.0
577	---	1,604.5	---	---	---	1,604.5
582	190.0	---	---	---	---	190.0
606	27.0	123.0	---	---	---	150.0
607	133.9	171.0	---	---	---	304.9
608	395.0	14.0	---	---	---	409.0
609	215.6	261.3	---	---	---	476.9
610	183.0	---	---	---	---	183.0
611	231.0	125.9	---	---	---	356.9
612	59.0	38.0	---	---	---	97.0
613	284.0	222.0	---	---	---	506.0

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Management with Private Land (cont.)						
616	120.0	331.0	427.0	117.0	---	995.0
618	48.0	449.2	---	---	---	497.2
619	50.0	227.0	---	231.0	---	635.0
620	---	100.0	60.0	---	---	160.0
621	91.0	76.0	---	---	---	167.0
623	145.7	140.0	55.0	---	---	340.7
624	---	300.0	285.0	10.0	---	595.0
625	794.0	75.0	---	---	---	869.0
626	183.0	158.0	28.0	47.0	---	416.0
627	---	447.7	761.6	---	---	1,209.3
Sub-total	10,243.6	8,907.2	2,693.5	657.0	77.0	22,578.3
Grand Total	571,784.3	312,737.5	86,558.8	23,838.8	19,376.8	1,014,296.2
Percent	56.5	30.8	8.5	2.4	1.9	100.0

Appendix Table F-8
Alternative #2 - Condition Class in 20 Years

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management - Acres						
450	1,356.6	2,002.1	647.7	---	---	4,023.4
500	18,832.5	2,332.6	2,697.9	---	4,677.4	28,540.4
501	17,541.7	271.0	328.0	---	---	18,140.7
502	2,650.2	1,254.4	---	---	---	3,904.6
503	15,751.2	1,258.6	256.0	---	---	17,265.8
505	4,471.1	1,664.3	---	---	---	6,135.4
506	18,541.8	1,690.0	1,777.1	---	---	22,008.9
507	1,049.0	147.9	---	---	735.8	1,932.7
508	15,709.1	4,057.0	19,536.0	347.0	---	39,649.1
509	---	712.0	798.0	---	67.0	1,577.0
513	10,069.9	---	---	---	---	10,069.0
514	5,077.4	564.2	414.0	302.3	---	6,357.9
515	742.0	2,803.3	7,713.0	---	1,754.0	13,012.3
516	8,365.9	766.5	7,476.0	---	---	16,608.4
517	61,114.0	4,129.0	2,261.0	---	---	67,504.0
518	---	2,890.0	270.9	---	1,466.0	4,626.9
519	9,359.8	2,063.7	---	---	---	11,423.5
521	6,611.3	4,813.5	---	---	2,089.0	13,915.8
522	4,416.4	1,120.6	---	402.0	---	5,537.0
525	3,429.0	1,110.1	1,132.4	---	294.0	7,199.5
526	1,169.0	4,343.3	158.0	1,234.0	---	5,670.3
529	3,272.2	---	124.0	---	---	3,396.2
530	280.0	---	57.0	---	1,204.0	1,541.0
531	5,283.9	---	---	---	492.0	5,798.9
532	13,364.5	12,332.2	---	---	---	25,696.7
533	3,232.0	2,863.0	10.0	---	---	6,105.0
534	1,505.0	2,161.0	---	---	---	3,666.0
535	38,692.0	4,029.0	8,000.0	---	---	50,721.0
536	3,671.2	467.3	---	---	---	4,138.5
539	62,531.8	31,498.2	4,729.6	---	84.0	98,843.6
540	31,777.4	9,556.7	3,068.7	---	---	44,402.8
541	14,921.0	19,098.0	---	4,942.0	---	38,961.0
542	543.5	---	231.0	---	863.0	1,637.5
546	10,900.8	2,334.7	685.4	---	---	13,920.9
548	21,408.0	10,475.8	2,338.0	308.0	---	34,529.8
549	3,957.4	1,070.8	---	---	---	5,028.2
550	5,636.7	2,834.3	---	---	---	8,471.0
551	9,588.0	8,681.1	2,429.4	---	---	20,698.5
552	1,776.0	---	---	---	---	1,776.0
553	599.8	---	---	---	---	657.8
554	14,052.5	1,441.0	259.4	---	---	15,752.5
556	4,332.5	4,517.2	1,886.8	109.1	---	10,845.6
557	1,443.6	---	---	---	---	1,443.6
562	1,255.7	2,088.7	54.0	---	18.0	3,416.4
563	2,486.7	370.0	760.0	900.0	153.0	4,669.7
565	6,240.3	3,339.5	---	---	3,946.6	13,526.4

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management (cont.)						
569	38,590.3	5,915.9	2,695.0	1,035.0	---	48,236.2
570	1,919.0	2,443.8	2,874.7	1,405.8	---	8,643.3
571	22,514.8	6,654.8	232.0	---	---	29,401.6
572	1,045.7	42.4	---	---	---	1,088.1
573	3,444.5	6,087.8	---	---	---	9,532.3
574	2,610.2	25.4	---	---	---	2,635.6
578	9,282.7	574.4	---	---	---	9,857.1
579	6,628.8	1,051.0	---	---	3,741.0	11,420.8
580	9,263.6	4,765.3	323.8	---	---	14,352.7
581	7,182.5	279.0	---	---	282.0	7,743.5
585	2,175.6	988.5	---	---	944.2	4,108.3
587	3,458.3	6,666.0	75.0	---	---	10,199.3
588	9,810.2	3,234.8	1,323.0	---	---	14,368.0
589	5,803.0	2,150.2	2,997.8	---	---	10,931.0
590	826.0	1,199.4	487.4	---	---	2,512.8
593	---	3,206.5	460.8	---	---	3,667.3
595	1,280.1	2,825.9	262.0	---	---	4,368.0
597	124.7	14.4	1,496.4	---	---	1,635.5
599	11,500.0	3,461.1	---	---	---	14,961.1
600	---	1,425.0	1,210.0	---	---	2,635.0
601	5,212.8	1,111.0	---	---	---	6,323.8
602	2,167.0	2,598.7	---	---	---	4,765.7
603	3,093.6	4,666.1	---	---	---	7,759.7
Sub-total	620,407.4	219,540.0	85,533.8	10,985.2	22,811.0	959,277.4
Less Intensive Management - Acres						
510	435.0	14.0	---	---	---	449.0
520	2,568.6	7,505.6	1,457.6	364.4	---	11,896.2
544	155.6	759.4	---	---	---	915.0
558	608.0	---	---	---	52.0	660.0
559	609.6	---	---	---	---	609.6
560	653.1	41.0	7.0	---	---	701.1
561	1,237.1	4,231.3	474.0	---	---	5,942.4
564	102.3	805.9	115.4	---	---	1,023.6
576	553.0	357.6	234.2	---	---	1,144.8
586	487.0	363.0	---	---	---	850.0
591	2,569.0	1,357.7	---	---	---	3,980.8
592	253.0	20.0	---	---	---	273.0
594	---	216.0	---	---	---	216.0
596	379.3	392.8	---	---	---	772.1
598	2,638.7	368.2	---	---	---	3,006.9
Sub-total	12,987.2	16,694.6	2,342.3	364.4	52.0	32,440.5

Appendix Table F-8 cont.

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Management with Private Lands - Acres						
453	70.0	---	---	---	---	70.0
454	398.0	---	---	---	---	398.0
455	120.0	---	---	---	---	120.0
456	986.0	---	---	---	---	986.0
457	25.0	---	---	---	---	25.0
458	71.0	372.1	65.7	---	---	508.8
459	5.4	753.0	---	---	---	758.4
461	17.9	74.5	---	---	---	92.4
463	35.0	---	---	---	---	35.0
464	38.0	---	---	---	---	38.0
465	448.8	---	---	---	---	448.8
466	777.2	---	---	---	---	777.2
467	77.0	43.0	---	---	---	120.0
469	67.0	---	---	---	---	67.0
470	20.0	---	---	---	---	20.0
471	---	28.0	---	---	---	28.0
472	51.0	---	---	---	---	51.0
473	128.0	---	---	---	---	128.0
476	---	---	158.0	---	---	158.0
477	94.0	14.0	---	---	---	108.0
479	35.0	6.0	---	---	---	41.0
483	60.0	---	---	---	---	60.0
485	65.4	---	---	---	---	65.4
486	108.0	---	---	---	---	108.0
487	45.0	458.0	---	---	---	503.0
491	---	504.6	---	---	---	504.6
492	40.0	---	---	---	---	40.0
504	525.0	---	---	---	---	525.0
511	---	103.6	149.4	---	---	253.0
515-3	---	29.0	94.0	120.0	---	243.0
523	8.0	---	482.8	---	---	490.8
537	820.0	---	---	---	---	820.0
543	596.0	---	---	---	---	596.0
545	718.0	79.6	---	132.0	77.0	1,006.6
555	120.0	---	---	---	---	120.0
566	434.5	---	---	---	---	434.5
567	99.1	817.3	---	---	---	916.4
575	149.3	601.7	---	---	---	751.0
577	---	1,604.5	---	---	---	1,604.5
582	190.0	---	---	---	---	190.0
606	150.0	---	---	---	---	150.0
607	304.9	---	---	---	---	304.9
608	409.0	---	---	---	---	409.0
609	215.6	261.3	---	---	---	476.9
610	183.0	---	---	---	---	183.0
611	97.0	125.9	---	---	---	356.9
612	284.0	---	---	---	---	97.0

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Management with Private Lands (cont.)						
613	284.0	222.0	---	---	---	506.0
616	120.0	331.0	427.0	117.0	---	995.0
618	48.0	449.2	---	---	---	497.2
619	50.0	227.0	127.0	231.0	---	635.0
620	---	100.0	60.0	---	---	160.0
621	91.0	76.0	---	---	---	167.0
623	145.7	140.0	55.0	---	---	340.7
624	---	300.0	285.0	10.0	---	595.0
625	794.0	75.0	---	---	---	869.0
626	183.0	158.0	28.0	47.0	---	416.0
627	---	447.7	761.6	---	---	1,209.3
Sub-total	10,748.8	8,402.0	2,693.5	657.0	77.0	22,578.3
Grand Total	644,142.4	244,636.6	90,569.6	12,006.6	22,940.0	1,014,296.2
PERCENT	63.5	24.1	8.9	1.2	2.3	100.0

Appendix Table F-9
Alternative #3 - Condition Class in 20 Years

Alternative #3 - Condition Class in 20 years

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management - Acres						
450	678.3	678.3	2,002.1	664.7	---	4,023.4
500	9,761.8	9,070.7	2,332.6	2,697.9	4,677.4	28,540.4
501	9,007.0	5,700.3	3,105.4	328.0	---	18,140.7
502	331.3	2,318.9	1,254.4	---	---	3,904.6
503	3,198.8	12,552.4	1,258.6	256.0	---	17,265.8
505	2,191.5	2,191.5	1,752.4	---	---	6,135.4
506	9,118.4	9,423.4	3,112.6	354.5	---	22,008.9
507	524.5	524.5	147.9	---	735.8	1,932.7
508	6,954.8	8,754.3	18,034.2	5,905.8	---	39,649.1
509	---	---	1,400.0	110.0	67.0	1,577.0
513	6,746.2	3,322.8	---	---	---	10,069.0
514	---	5,077.4	564.2	716.3	---	6,357.9
515	371.0	371.0	10,498.3	18.0	1,754.0	13,012.3
516	3,992.5	4,373.4	6,400.5	1,842.0	---	16,608.4
517	28,682.5	32,431.5	4,593.4	1,796.6	---	67,504.0
518	---	---	2,890.0	270.9	1,466.0	4,626.9
519	4,679.9	4,679.9	2,063.7	---	---	11,423.5
521	3,305.7	3,305.6	4,813.5	402.0	2,089.0	13,915.8
522	3,403.0	1,013.4	1,120.6	---	---	5,537.0
525	1,714.5	1,714.5	1,050.5	2,426.0	294.0	7,199.5
526	335.5	833.5	4,343.3	158.0	---	5,670.3
529	909.1	1,636.1	727.0	124.0	---	3,396.2
530	138.5	138.5	---	60.0	1,204.0	1,541.0
531	2,019.9	2,544.9	500.1	---	734.0	5,798.9
532	3,840.0	9,524.5	12,332.2	---	---	25,696.7
533	808.0	2,424.0	2,863.0	10.0	---	6,105.0
534	278.3	1,226.7	2,161.0	---	---	3,666.0
535	19,346.0	19,346.0	12,029.0	---	---	50,721.0
536	1,602.0	1,835.5	701.0	---	---	4,138.5
539	24,143.3	31,265.8	38,620.9	4,729.6	84.0	98,843.6
540	6,549.8	15,888.6	18,895.7	3,068.7	---	44,402.8
541	3,730.3	3,730.2	26,558.5	4,942.0	---	38,961.0
542	267.0	272.0	4.5	231.0	863.0	1,637.5
546	5,450.4	5,450.4	2,334.7	685.4	---	13,920.9
548	7,163.8	10,704.0	14,016.0	2,646.0	---	34,529.8
549	1,978.7	1,978.7	1,070.8	---	---	5,028.2
550	2,818.4	2,818.4	2,834.3	---	---	8,471.0
551	4,794.0	4,794.0	8,681.1	2,429.4	---	20,698.5
552	888.0	888.0	---	---	---	1,776.0
553	282.8	357.5	17.5	---	---	657.8
554	6,786.8	7,265.7	1,441.0	259.0	---	15,752.5
556	2,151.8	2,166.2	5,393.0	1,134.6	---	10,845.6
557	669.8	721.8	52.0	---	---	1,443.6
562	627.9	627.8	2,088.7	54.0	18.0	3,416.4
563	1,090.4	1,396.3	330.0	1,700.0	153.0	4,669.7
565	---	5,020.4	4,559.4	---	3,946.6	13,526.4

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management (cont.) - Acres						
565	1,900.3	7,066.7	4,559.4	---	---	13,526.4
568	1,691.8	1,691.7	---	---	---	3,383.5
569	3,520.0	31,070.2	9,763.4	3,882.5	---	48,236.2
570	286.5	1,632.4	3,456.5	3,267.9	---	8,643.3
571	11,082.3	11,082.3	7,005.0	232.0	---	29,401.6
572	522.9	522.8	42.4	---	---	1,088.1
573	---	3,444.5	6,087.8	---	---	9,532.3
574	---	2,610.2	25.4	---	---	2,635.6
578	4,569.6	4,569.5	718.0	---	---	9,857.1
579	2,651.5	3,977.3	1,051.0	---	3,741.0	11,420.8
580	3,336.4	5,927.2	4,765.3	323.8	---	14,352.7
581	3,591.3	3,591.2	279.0	---	282.0	7,743.5
585	874.6	1,795.2	494.3	---	944.2	4,108.3
587	1,298.6	2,159.7	6,671.0	70.0	---	10,199.3
588	4,905.1	4,905.1	3,234.8	1,323.0	---	14,368.0
589	2,901.5	2,901.5	2,150.2	2,977.8	---	10,931.0
590	413.0	413.0	1,199.4	487.4	---	2,512.8
593	---	---	3,206.5	460.8	---	3,667.3
595	34.5	640.0	3,431.5	262.0	---	4,368.0
597	62.4	62.3	14.4	1,496.4	---	1,635.5
599	1,558.5	9,941.5	3,461.1	---	---	14,961.1
600	---	---	1,425.0	1,210.0	---	2,635.0
601	1,346.5	3,866.3	1,111.0	---	---	6,323.8
602	1,083.5	1,083.5	2,598.7	---	---	4,765.9
603	1,546.8	1,546.8	4,666.1	---	---	7,759.7
Sub-total	240,609.5	341,793.5	297,807.4	56,014.0	23,053.0	959,277.4
Less Intensive Management - Acres						
510	217.5	217.5	14.0	---	---	449.0
520	1,284.3	1,284.3	7,870.0	1,457.6	---	11,896.2
544	---	155.6	759.4	---	---	915.0
558	304.0	304.0	---	---	52.0	660.0
559	304.8	304.8	---	---	---	609.6
560	326.5	326.6	41.0	7.0	---	701.1
561	618.5	618.6	4,231.3	474.0	---	5,942.4
564	---	51.1	857.1	115.4	---	1,023.6
576	276.5	276.5	357.6	234.2	---	1,144.8
586	243.5	243.5	363.0	---	---	850.0
591	1,284.5	1,284.5	1,357.7	54.1	---	3,980.8
592	126.5	126.5	20.0	---	---	273.0
594	---	---	216.0	---	---	216.0
596	189.7	189.6	392.8	---	---	772.1
598	1,202.8	1,435.9	368.2	---	---	3,006.9
Sub-total	6,379.1	6,819.0	16,848.1	2,342.3	52.0	32,440.5

Appendix Table F-9 cont.

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Management with Private Lands - Acres						
453	50.0	20.0	---	---	---	70.0
454	279.0	119.0	---	---	---	398.0
455	80.0	40.0	---	---	---	120.0
456	658.0	328.0	---	---	---	986.0
457	17.0	8.0	---	---	---	25.0
458	50.0	355.9	102.9	---	---	508.8
459	---	708.4	50.0	---	---	758.4
461	---	92.4	---	---	---	92.4
463	20.0	15.0	---	---	---	35.0
464	21.0	17.0	---	---	---	38.0
465	273.1	175.7	---	---	---	448.8
466	609.0	168.2	---	---	---	777.2
467	13.0	107.0	---	---	---	120.0
469	57.0	10.0	---	---	---	67.0
470	7.0	13.0	---	---	---	20.0
471	---	19.0	9.0	---	---	28.0
472	30.0	21.0	---	---	---	51.0
473	75.0	53.0	---	---	---	128.0
476	---	48.0	110.0	---	---	158.0
477	63.0	45.0	---	---	---	108.0
479	---	24.0	17.0	---	---	41.0
483	25.0	35.0	---	---	---	60.0
485	49.4	16.0	---	---	---	65.4
486	90.0	18.0	---	---	---	108.0
487	20.0	458.0	25.0	---	---	503.0
491	---	373.6	131.0	---	---	504.6
492	30.0	10.0	---	---	---	40.0
504	210.0	315.0	---	---	---	525.0
511	---	88.6	164.4	---	---	253.0
515-3	---	29.0	94.0	120.0	---	243.0
523	---	8.0	482.8	---	---	490.8
537	690.0	130.0	---	---	---	820.0
543	417.2	178.8	---	---	---	596.0
545	552.1	165.9	79.6	132.0	77.0	1,006.6
555	75.0	45.0	---	---	---	120.0
566	198.1	236.4	---	---	---	434.5
567	224.3	406.1	286.0	---	---	916.4
575	169.6	397.8	183.6	---	---	751.0
577	402.9	1,161.6	40.0	---	---	1,604.5
582	175.0	15.0	---	---	---	190.0
606	60.1	89.9	---	---	---	150.0
607	149.1	134.8	21.0	---	---	304.9
608	365.0	44.0	---	---	---	409.0
609	142.8	334.1	---	---	---	476.9
610	148.0	35.0	---	---	---	183.0
611	198.0	158.9	---	---	---	356.9
612	51.0	46.0	---	---	---	97.0

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Management with Private Lands (cont.)						
613	231.0	275.0	---	---	---	506.0
616	100.0	351.0	427.0	117.0	---	995.0
618	38.0	459.2	---	---	---	497.2
619	35.0	235.0	134.0	231.0	---	635.0
620	---	75.0	85.0	---	---	160.0
621	40.0	127.0	---	---	---	167.0
623	62.7	223.0	55.0	---	---	340.7
624	---	350.0	235.0	10.0	---	595.0
625	526.0	343.0	---	---	---	869.0
626	183.0	158.0	28.0	47.0	---	416.0
627	---	508.2	701.1	---	---	1,209.3
Sub-total	7,960.4	10,469.5	3,461.4	657.0	77.0	22,578.3
Grand Total	254,949.0	359,035.0	318,116.9	59,013.3	23,182.0	1,014,296.2
PERCENT	25.1	35.4	31.4	5.8	2.3	100.0

Appendix Table F-10
Alternative #4 - Condition Class in 20 Years

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management - Acres						
450	267.1	1,400.6	1,192.5	---	1,163.2	4,023.4
500	12,336.1	2,564.4	2,697.9	---	10,942.0	28,540.4
501	10,846.1	2,082.9	328.0	---	4,883.7	18,140.7
502	1,372.2	1,277.2	200.0	---	1,055.2	3,904.6
503	7,623.0	1,808.4	256.0	---	7,578.4	17,265.8
505	2,858.0	623.4	1,337.0	---	1,317.0	6,135.4
506	7,313.9	3,733.1	1,777.1	---	9,184.8	22,008.9
507	276.4	276.5	73.9	---	1,305.9	1,932.7
508	6,059.2	3,321.0	19,536.0	2,347.0	8,385.9	39,649.1
509	---	55.7	1,168.8	---	352.5	1,577.0
513	8,617.7	---	---	---	1,451.3	10,069.0
514	259.2	2,332.7	414.0	302.3	3,049.7	6,357.9
515	---	1,350.6	7,713.0	---	3,948.7	13,012.3
516	---	3,077.2	7,476.0	---	6,055.2	16,608.4
517	37,404.6	11,881.0	2,261.0	---	15,957.4	67,504.0
518	---	708.5	963.1	---	2,955.3	4,626.9
519	4,374.1	2,006.5	886.0	---	4,156.9	11,423.5
521	443.8	1,632.4	4,332.2	402.0	7,105.4	13,915.8
522	2,081.7	737.1	---	---	2,718.2	5,537.0
525	1,279.9	1,110.1	1,132.4	1,234.0	2,443.1	7,199.5
526	---	3,796.8	983.4	---	890.1	5,670.3
529	1,117.6	1,121.9	124.0	---	1,032.7	3,396.2
530	---	210.7	57.0	---	1,273.3	1,541.0
531	2,668.9	1,121.5	---	---	2,008.5	5,798.9
532	6,199.1	11,877.0	5,530.0	---	2,090.6	25,696.7
533	2,351.1	1,551.1	10.0	---	2,192.8	6,105.0
534	483.0	897.0	978.3	---	1,307.7	3,666.0
535	32,225.7	8,599.0	8,000.0	---	1,896.3	50,721.0
536	1,722.3	1,253.7	373.8	---	788.7	4,138.5
539	34,679.6	24,155.2	13,311.2	---	26,697.6	98,843.6
540	14,547.7	14,753.0	8,608.0	---	6,494.1	44,402.8
541	4,646.3	10,672.3	11,951.4	4,942.0	6,749.0	38,961.0
542	306.6	126.1	231.0	---	973.8	1,637.5
546	3,344.5	5,041.9	2,718.1	---	2,816.4	13,920.9
548	8,609.9	8,810.0	12,981.2	308.0	3,820.7	34,529.8
549	1,320.1	1,426.8	178.4	---	2,102.9	5,028.2
550	2,944.1	3,878.7	163.8	---	1,484.4	8,471.0
551	2,996.3	7,391.8	5,393.3	---	4,917.1	20,698.5
552	940.8	180.5	---	---	654.7	1,776.0
553	466.6	70.0	---	---	121.2	657.8
554	9,196.5	2,742.8	532.5	---	3,280.7	15,752.5
556	2,634.2	4,546.1	1,886.8	109.1	1,699.4	10,845.6
557	1,187.5	52.0	---	---	204.1	1,443.6
562	---	71.5	1,358.5	---	1,986.4	3,416.4
Intensive Management (cont.)						
563	1,769.3	570.0	760.0	900.0	670.4	4,669.7
565	---	1,132.5	2,967.0	---	9,426.9	13,526.4
568	1,475.6	1,065.9	---	---	842.0	3,383.5
569	21,129.7	6,914.0	2,695.0	1,035.0	16,462.5	48,236.2
570	---	2,279.5	2,874.7	1,405.8	2,083.3	8,643.3
571	17,508.4	6,654.8	232.0	---	5,006.4	29,401.6
572	894.5	42.4	---	---	151.2	1,088.1
573	1,480.6	2,749.8	1,651.6	---	3,650.3	9,532.3
574	1,127.9	1,141.9	---	---	365.8	2,635.6
578	8,448.5	574.4	---	---	834.2	9,857.1
579	3,078.9	1,641.6	---	---	6,700.3	11,420.8
580	6,948.0	3,340.5	1,422.4	---	2,641.8	14,352.7
581	3,861.0	1,995.0	---	---	1,887.5	7,743.5
585	941.1	1,581.6	---	---	1,585.6	4,108.3
587	---	6,332.2	951.0	---	2,916.1	10,199.3
588	4,948.6	4,211.6	1,573.6	---	3,634.2	14,368.0
589	2,635.0	3,218.0	2,683.2	---	2,394.8	10,931.0
590	---	739.6	750.0	---	1,023.2	2,512.8
593	---	1,329.5	2,337.8	---	---	3,667.3
595	---	2,001.9	1,155.2	---	1,210.9	4,368.0
597	47.8	132.5	1,421.6	---	33.6	1,635.5
599	5,119.9	6,007.4	---	---	3,833.8	14,961.1
600	---	406.6	2,228.4	---	---	2,635.0
601	2,767.2	1,787.7	---	---	1,768.9	6,323.8
602	3,870.7	853.3	---	---	41.7	4,765.7
603	1,081.2	1,664.8	1,261.6	---	3,752.1	7,759.7
Sub-total	327,135.3	216,695.7	156,080.7	12,985.2	246,380.5	959,277.4
Less Intensive Management - Acres						
510	211.7	111.0	14.0	---	112.3	449.0
520	566.8	5,040.4	2,836.8	560.0	2,892.2	11,896.2
544	---	459.9	227.7	---	227.4	915.0
558	---	304.1	---	---	355.9	660.0
559	257.2	200.0	---	---	152.4	609.6
560	---	132.9	48.0	---	520.2	701.1
561	---	2,726.1	1,870.0	---	1,346.3	5,942.4
564	---	299.5	518.0	---	206.1	1,023.6
576	114.7	483.6	284.2	---	262.3	1,144.8
586	---	281.3	50.0	---	518.7	850.0
591	763.0	1,757.9	501.9	---	958.0	3,980.8
592	128.0	135.0	10.0	---	---	273.0
594	---	57.5	65.0	---	93.5	216.0
596	91.4	377.6	129.0	---	174.1	772.1
598	1,968.2	841.9	---	---	196.8	3,006.9
Sub-total	4,101.0	13,2087	6,554.6	560.0	8,016.2	32,440.5

Appendix Table F-10 cont.

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Management with Private Land - Acres						
453	50.0	20.0	---	---	---	70.0
454	279.0	119.0	---	---	---	398.0
455	80.0	40.0	---	---	---	120.0
456	658.0	328.0	---	---	---	986.0
457	17.0	8.0	---	---	---	25.0
458	50.0	355.9	102.9	---	---	508.8
459	---	708.4	50.0	---	---	758.4
461	---	92.4	---	---	---	92.4
463	20.0	15.0	---	---	---	35.0
464	21.0	17.0	---	---	---	38.0
465	273.1	175.7	---	---	---	448.8
466	609.0	168.2	---	---	---	777.2
467	13.0	107.0	---	---	---	120.0
469	57.0	10.0	---	---	---	67.0
470	7.0	13.0	---	---	---	20.0
471	---	19.0	9.0	---	---	28.0
472	30.0	21.0	---	---	---	51.0
473	75.0	53.0	---	---	---	128.0
476	---	48.0	110.0	---	---	158.0
477	63.0	45.0	---	---	---	108.0
479	---	24.0	17.0	---	---	41.0
483	25.0	35.0	---	---	---	60.0
485	49.4	16.0	---	---	---	65.4
486	90.0	18.0	---	---	---	108.0
487	20.0	458.0	25.0	---	---	503.0
491	---	373.6	131.0	---	---	504.6
492	30.0	10.0	---	---	---	40.0
504	65.4	315.0	---	---	144.6	525.0
511	---	37.6	164.4	---	51.0	253.0
515-3	---	29.0	94.0	120.0	---	243.0
523	---	8.0	482.8	---	---	490.8
537	484.7	130.0	---	---	205.3	820.0
543	268.2	178.8	---	---	149.0	596.0
545	52.1	165.9	79.6	132.0	577.0	1,006.6
555	75.0	45.0	---	---	---	120.0
566	---	236.4	---	---	198.1	434.5
567	---	406.1	286.0	---	224.3	916.4
575	---	397.8	183.6	---	169.6	751.0
577	---	1,161.6	40.0	---	402.9	1,604.5
582	175.0	15.0	---	---	---	190.0
606	---	89.9	---	---	60.1	150.0
607	---	134.8	21.0	---	149.1	304.9
608	187.7	44.0	---	---	177.3	409.0
609	124.7	334.1	---	---	18.1	476.9
610	148.0	35.0	---	---	---	183.0
611	198.0	158.9	---	---	---	356.9
612	51.0	46.0	---	---	---	97.0
Management with Private Lands (cont.)						
613	39.1	275.0	---	---	191.9	506.0
616	100.0	351.0	427.0	117.0	---	995.0
618	38.0	459.2	---	---	---	497.2
619	35.0	235.0	134.0	231.0	---	635.0
620	---	75.0	85.0	---	---	160.0
621	40.0	127.0	---	---	---	167.0
623	62.7	223.0	55.0	---	---	340.7
624	---	350.0	235.0	10.0	---	595.0
625	415.1	343.0	---	---	110.9	869.0
626	183.0	158.0	28.0	47.0	---	416.0
627	---	508.2	701.1	---	---	1,209.3
Sub-total	5,259.2	10,371.5	3,461.4	657.0	2,829.2	22,578.3
Grand Total	336,495.5	240,275.9	166,096.7	14,202.2	257,225.9	1,014,296.2
Percent	33.1	23.7	16.4	1.4	25.4	100.0

Appendix Table F-11
Alternative #5 - Condition Class in 20 Years

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Intensive Management - Acres						
450	---	496.7	1,325.0	---	2,201.7	4,023.4
500	13,734.2	1,166.3	2,697.9	---	10,942.0	28,540.4
501	12,883.3	---	328.0	---	4,929.4	18,140.7
502	2,633.4	---	---	---	1,271.2	3,904.6
503	5,670.2	1,230.6	256.0	---	10,109.0	17,265.8
505	---	669.1	1,752.4	---	3,713.9	6,135.4
506	2,811.7	2,810.8	1,777.1	---	14,609.3	22,008.9
507	232.1	140.4	---	---	1,560.2	1,932.7
508	2,261.8	1,720.6	20,272.0	2,347.0	13,047.7	39,649.1
509	---	---	600.6	110.0	866.4	1,577.0
513	8,549.3	---	---	---	1,519.7	10,069.0
514	1,618.9	564.2	414.0	302.3	3,458.5	6,357.9
515	---	---	2,209.2	18.0	10,785.1	13,012.3
516	---	---	5,902.1	---	10,706.3	16,608.4
517	35,879.0	11,343.5	2,380.0	---	17,901.5	67,504.0
518	1,200.5	---	270.9	---	3,155.5	4,626.9
519	5,054.2	1,063.0	---	---	5,306.3	11,423.5
521	2,048.2	2,676.9	---	402.0	8,788.7	13,915.8
522	1,848.1	539.6	---	---	3,149.3	5,537.0
525	1,225.3	445.0	1,192.0	1,234.0	3,103.2	7,199.5
526	404.2	3,375.5	158.0	---	1,732.6	5,670.3
529	1,357.1	---	124.0	---	1,915.1	3,396.2
530	---	---	143.1	---	1,397.9	1,541.0
531	1,425.3	---	---	---	4,373.6	5,798.9
532	12,188.4	10,911.8	---	---	2,596.5	25,696.7
533	945.5	1,075.2	---	---	4,084.3	6,105.0
534	447.6	456.8	---	---	2,761.6	3,666.0
535	31,938.7	8,465.7	8,420.3	---	1,896.3	50,721.0
536	2,741.9	---	---	---	1,396.6	4,138.5
539	44,323.9	18,838.3	4,729.6	---	30,951.8	98,843.6
540	26,685.9	5,344.5	3,068.7	---	9,303.7	44,402.8
541	11,304.7	15,949.8	---	4,942.0	6,764.5	38,961.0
542	189.1	189.1	54.5	231.0	973.8	1,637.5
546	7,947.6	2,177.6	685.4	---	3,110.3	13,920.9
548	8,414.1	7,067.0	13,664.4	308.0	5,076.3	34,529.8
549	1,880.7	929.1	---	---	2,218.4	5,028.2
550	3,682.3	2,648.6	172.4	---	1,967.7	8,471.0
551	4,670.8	8,681.1	2,429.4	---	4,917.2	20,698.5
552	421.0	---	---	---	1,355.0	1,776.0
553	230.1	---	---	---	427.7	657.8
554	7,510.6	721.4	259.0	---	7,261.5	15,752.5
556	37.9	---	2,050.9	109.1	8,647.7	10,845.6
557	257.4	---	---	---	1,186.2	1,443.6
562	---	---	860.4	54.0	2,502.0	3,416.4
563	674.5	134.4	760.0	900.0	2,200.8	4,669.7
565	6,935.6	---	---	---	6,590.8	13,526.4
Intensive Management (cont.)						
568	737.6	1,691.7	---	---	954.2	3,383.5
569	17,961.3	1,483.2	2,695.0	1,035.0	25,061.7	48,236.2
570	---	650.4	3,026.0	1,405.8	3,561.1	8,643.3
571	6,007.5	10,666.0	7,005.0	232.0	5,491.1	29,401.6
572	169.6	31.8	---	---	886.7	1,088.1
573	1,240.0	2,574.0	---	---	5,718.3	9,532.3
574	2,269.8	---	---	---	365.8	2,635.6
578	8,518.1	504.8	---	---	834.2	9,857.1
579	4,712.5	372.4	---	---	6,335.9	11,420.8
580	1,553.2	1,666.2	323.8	---	10,809.5	14,352.7
581	3,054.6	266.7	---	---	4,422.2	7,743.5
585	2,522.7	---	---	---	1,585.6	4,108.3
587	6,566.0	---	75.0	---	3,558.3	10,199.3
588	8,995.0	---	1,323.0	---	4,050.0	14,368.0
589	1,619.7	---	2,977.8	---	6,333.5	10,931.0
590	179.4	---	487.4	---	1,846.0	2,512.8
593	---	---	3,206.5	460.8	---	3,667.3
595	1,253.5	1,061.5	262.0	---	1,791.0	4,368.0
597	20.4	52.2	14.4	1,496.4	52.1	1,635.5
599	7,433.9	2,274.9	---	---	5,252.3	14,961.1
600	---	---	1,376.9	1,210.0	48.1	2,635.0
601	3,308.5	796.2	---	---	2,219.1	6,323.8
602	2,197.4	---	---	---	2,568.3	4,765.7
603	2,397.9	846.6	---	---	4,515.2	7,759.7
Sub-total	356,983.7	136,771.2	101,730.1	16,797.4	346,995.0	959,277.4
Less Intensive Management - Acres						
510	322.7	14.0	---	---	112.3	449.0
520	1,558.1	3,738.5	1,457.6	364.4	4,777.6	11,896.2
544	281.5	---	---	---	633.5	915.0
558	91.8	---	---	---	568.2	660.0
559	457.2	---	---	---	152.4	609.6
560	127.7	18.5	7.0	---	547.9	701.1
561	---	---	3,476.8	474.0	1,991.6	5,942.4
564	225.1	170.2	115.4	---	512.9	1,023.6
576	414.7	120.4	234.2	---	375.5	1,144.8
586	181.3	---	---	---	668.7	850.0
591	1,364.2	929.7	---	---	1,686.9	3,980.8
592	120.6	11.0	---	---	141.4	273.0
594	113.3	---	---	---	102.7	216.0
596	113.8	203.9	---	---	454.4	772.1
598	1,962.0	363.8	---	---	681.1	3,006.9
Sub-total	7,334.0	5,570.0	5,291.0	838.4	13,407.1	32,440.5

Appendix Table F-11 cont.

Allot.	Poor	Fair	Good	Excellent	Treated	Total
Management with Private Land - Acres						
453	70.0	---	---	---	---	70.0
454	398.0	---	---	---	---	398.0
455	120.0	---	---	---	---	120.0
456	986.0	---	---	---	---	986.0
457	25.0	---	---	---	---	25.0
458	71.0	372.1	65.7	---	---	508.8
459	5.4	753.0	---	---	---	758.4
461	17.9	74.5	---	---	---	92.4
463	35.0	---	---	---	---	35.0
464	38.0	---	---	---	---	38.0
465	448.8	---	---	---	---	448.8
466	777.2	---	---	---	---	777.2
467	77.0	43.0	---	---	---	120.0
469	67.0	---	---	---	---	67.0
470	20.0	---	---	---	---	20.0
471	---	28.0	---	---	---	28.0
472	51.0	---	---	---	---	51.0
473	128.0	---	---	---	---	128.0
476	---	---	158.0	---	---	158.0
477	94.0	14.0	---	---	---	108.0
479	35.0	6.0	---	---	---	41.0
483	60.0	---	---	---	---	60.0
485	65.4	---	---	---	---	65.4
486	108.0	---	---	---	---	108.0
487	45.0	458.0	---	---	---	503.0
491	---	504.6	---	---	---	504.6
492	40.0	---	---	---	---	40.0
504	100.7	---	---	---	424.3	525.0
511	---	14.4	149.4	---	89.2	253.0
515-3	---	29.0	94.0	120.0	---	243.0
523	---	8.0	482.8	---	---	490.8
537	353.8	---	---	---	466.2	820.0
543	447.0	---	---	---	149.0	596.0
545	233.5	26.1	---	---	747.0	1,006.6
555	120.0	---	---	---	---	120.0
566	225.0	---	---	---	209.5	434.5
567	29.7	245.2	---	---	641.5	916.4
575	67.2	468.1	---	---	215.7	751.0
577	---	830.3	40.0	---	734.2	1,604.5
582	104.5	---	---	---	85.5	190.0
606	89.9	---	---	---	60.1	150.0
607	155.8	---	---	---	149.1	304.9
608	149.6	---	---	---	259.4	409.0
609	142.8	334.1	---	---	---	476.9
610	183.0	---	---	---	---	183.0
611	199.7	125.9	---	---	31.3	356.9
612	46.6	---	---	---	50.4	97.0
Management with Private Land (cont.)						
613	134.6	173.1	---	---	198.3	506.0
616	100.0	351.0	427.0	117.0	---	995.0
618	48.0	449.2	---	---	---	497.2
619	35.0	235.0	134.0	231.0	---	635.0
620	---	100.0	60.0	---	---	160.0
621	91.0	76.0	---	---	---	167.0
623	62.7	223.0	55.0	---	---	340.7
624	---	350.0	235.0	10.0	---	595.0
625	655.6	20.7	---	---	192.7	869.0
626	196.6	144.4	28.0	47.0	---	416.0
627	---	508.2	701.1	---	---	1,209.3
Sub-total	7,755.0	6,964.9	2,630.0	525.0	4,703.4	22,578.3
Grand Total	372,072.7	149,306.1	109,651.1	18,160.8	365,105.5	1,014,296.2
Percent	36.7	14.7	10.8	1.8	36.0	100.0

Appendix G
Vegetation Impact
Analysis Methods

In this analysis, the primary vegetation characteristics used to assess environmental impacts to vegetation were ecological condition and trend. Very little research has been documented on what the combined effects of grazing management (e.g., turn out dates, various grazing systems, etc.), project developments (e.g., springs, reservoirs, etc.), and land treatments (e.g., sprays, burns, seedings) have on the ecological condition of sagebrush-bunchgrass range. As a result, precise quantification of impacts to vegetation is not probable. Estimation of vegetation impacts, resulting from various management programs, often becomes an artful application of professional judgement, guided by appropriate literature. However, if this artful application is consistent in all alternatives, a relative comparison analysis is possible.

Methods

Ecological Condition-Trend Prediction:

Specific assumptions used to predict changes in ecological condition were developed using appropriate literature and knowledge of existing conditions and trends. These assumptions resulted in an estimate of the 20-year ecological condition response from the grazing management described in each of the alternatives (see appropriate impact section).

If land treatments were not a part of a specific alternative description, the prediction of resultant ecological condition from grazing management was considered complete. When land treatments were a part of an alternative's description, it was necessary to adjust the predicted 20-year ecological condition response to reflect native range areas that would be treated (see allotment example one below).

Example One

	Ecological Condition Acreages				
	Poor	Fair	Good	Excellent	Treated
Current Situation	35	40	20	5	0
Projected Situation from grazing mgmt.	20	50	25	5	0
Projected Treatment areas	-15	-5	0	0	+20
Net condition response	5	45	25	5	20

The net condition result is an estimate of the combined effect of all described management (grazing, project development, and land treatments) on ecological condition (see appropriate alternative impact summaries, Chapter 4).

Cover and Productivity Prediction:

Estimates of cover and productivity were derived directly from the projections of 20-year ecological condition. Resource inventory data, describing the site cover and productivity of each ecological site and condition class, was collected in 1977 and 1978 (see Appendix F).

The assumption was made: if an ecological site (currently in poor condition) was predicted to improve one condition class (to fair condition), the resultant cover and productivity of the predicted area would be the same as an existing area in fair condition.

After the prediction of 20-year ecological condition was made a recalculation of cover and productivity values followed. Computer data processing was used to make the calculations and insure their accuracy (see allotment Example Two, below).

Example Two

Cover and Productivity By Ecological Condition

	Poor	Fair	Good	Excellent	Treated
Ecological site effect cover (percent)	45	50	55	67	50
Ecological site productivity (usable forage-lbs/acre)	125	175	200	225	250
Current condition (acres)	35	40	20	5	0
projected condition (acres)	5	45	25	5	20

current

$$\text{cover} = \frac{(45\%\text{x}35\text{ acres})+(50\%\text{x}40\text{ acres})+(55\%\text{x}20\text{ acres})+(65\%\text{x}5\text{ acres})}{100\text{ acres}} = 50\%$$

projected

$$\text{cover} = \frac{(45\%\text{x}5\text{ acres})+(50\%\text{x}45\text{ acres})+(55\%\text{x}25\text{ acres})+(65\%\text{x}5\text{ acres})+(50\%\text{x}20\text{ acres})}{100\text{ acres}} = 52\%$$

current

$$\text{productivity} = \frac{(125\text{ lbs/acre x }35\text{ acres})+(175\text{ lbs/acre x }40\text{ acres})+(200\text{ lbs/acre x }20\text{ acres})+(225\text{ lbs/acre x }5\text{ acres})}{100\text{ acres}}$$

$= 165$ lbs/acre usable forage

projected

$$\text{productivity} = \frac{(125\text{ lbs/acre x }5\text{ acres})+(175\text{ lbs/acre x }45\text{ acres})+(200\text{ lbs/acre x }20\text{ acres})+(225\text{ lbs/acre x }5\text{ acres})+(250\text{ lbs/acre x }20\text{ acres})}{100\text{ acres}}$$

$= 186$ lbs/acre usable forage

Appendix H
Musgrave's Soil Loss Analysis and It's Applicability to the Owyhee Resource Area

Abstract

In order to quantify soil erosion in the Owyhee Resource Area (ORA) and meet the requirements of the EIS, Musgrave's Soil Loss Equation was used. This erosion model was developed to compare relative erosion rates on agricultural land. We are applying it to rangeland on an allotment and pasture basis. Musgrave's equation is assumed to be a good method for comparative analysis of sheet erosion in areas where actual erosion measurements have not been made. The results have been compared predicted soil losses by the Universal Soil Loss Equation (USLE) on Reynolds Creek watershed areas and with measured sediment yields from the experimental watersheds. The conclusion was that Musgrave's equation is an acceptable method of making comparative analyses of sheet erosion. Musgrave's equation has been adapted to computer analysis for comparing different management treatments. The results indicate that soil losses on the ORA currently averages 1.12 tons/acre/year which is approximately 25 percent higher than what would occur under optimum, excellent cover or range condition. This paper has been written to document the procedures used in adapting the Musgraves Equation to rangeland conditions and to analyze its applicability for predicting the effects on different/treatments range management. Musgrave's equation model of erosional responses and is considered a useful tool. The imput variables and field conditions should be fully understood before proper analysis can be made.

Purpose

To analyze, quantify and predict sheet erosion in the Owyhee resource area.

Procedures

Musgrave's Soil Loss Equation was used as the model for the analysis. The equation was selected over other soil loss methods because it is a standard BLM procedure (BLM Manual 7317) and has been adapted to computer analysis and used in other Idaho EIS's. Musgrave's equation is the forerunner of the Universal Soil Loss Equation, USLE and the factors considered by both are very similar. Much of the current research and field studies on erosion are based on the USLE, which is only recently being adapted for use on range and forested land. USLE has not been adapted to computer analysis by BLM.

Musgrave's soil loss equation has been developed by both research and field studies.

The equation is expressed:

$$E = FR\ (S/10)^{1.35}\ (L/72.6)^{0.35}\ (P30/1.375)^{1.75}$$

E = sheet erosion (tons/acre/year)
F = Soil factor, basic eosion rates (tons/acre/year)
R = Cover factor

S = slope in percent
L = length of slope in feet
P = Rainfall factor

F - Soil Factors, basic erosion rate in tons/acre/year. The F factor is determined by three soil characteristics: profile depth, permeability of the most limiting layer, and surface textures. Soil series are rated on all three soil characteristics and assigned an F factor. Coarse fragments (>2mm) are considered in the cover figures. Soil profile depth and texture classification are listed as follows:

Depth		Texture	
Deep	>20"	fine	>35% clay and/or >50% silt
Shallow	10-20"	medium	18-35% clay
Very Shallow	<10"	coarse	18% clay

These F factors are then weighted by soil series to determine their values by mapping unit. On borderline cases, extrapolations and professional adjustments are made.

R - Cover Factors. Range cover is summarized by range sites and condition class, from the 1976, 77, and 78 (ORA) range survey. Green plant, litter, and coarse fragments ground cover are used to obtain the total surface or canopy cover. Some adjustments in field data were necessary because of the variation in the number of samples, the varying time of year when the vegetation was surveyed, and the physiographic positions of where the better condition sites were found. The cover percentages for each mapping unit were calculated using the following equation:

$$R = 0.741 + (-2.14 \times 10^{-2} C) + (2.45 \times 10^{-5} C^2) + (-1.03 \times 10^{-7} C^3)$$

Since the variability of cover from year to year was very large in many areas, the range survey cover values were adjusted to reflect average climatic conditions. Adjustments were especially important in areas with a high proportion of annual vegetation. Accurate erosion prediction in these areas would require yearly range climatic, and erosion surveys.

The percent cover of coarse fragments was determined by mapping units using area-weighted means. Soil field description cards, soil series descriptions, mapping unit notes, and all other available information are used to determine the percent of coarse fragments (>2mm) by individual series. An average figure was determined by series then adjusted by mapping unit. All the series within a mapping unit were area-weighted. Rock outcrops were also weighted into the cover valued. The percent coarse fragments were then rounded to the nearest five percent because the real ranges were highly variable and factors computed to the nearest percentile would imply more significance. Rounding the cover values to the nearest five percent may not have been wise. These results were then compared with the range survey information and adjusted where discrepancies occured. Coarse fragments were of particular interest because Musgrave's Equation was used to predict the effects of change in plant and litter cover caused by different management programs where as the cover coarse fragments will remain fairly constant. The percent surface coarse fragments was used to represent the cover for the worst possible condition assuming no vegetative cover.

S = slope gradient and L = slope length. Average slope gradient was determined by individual soil series. It was then weighted by soil mapping units. The resulting percent slope was adjusted to agree with the mapping unit's most representative slope.

Slope length were determined by averaging from five to ten randomly selected measurements per mapping unit. Measurements were taken from aerial photographs and represent the length from ridge or hill crest to the first rill, gully, stream or depositional area. Only the sheet erosion occurring along this slope length was determined by this model.

Because of the extreme range in slope lengths on a large area, the representative slope lengths were difficult to determine in this erosion study. The larger the area, the larger the possible error. Wischmeier (1976) discussed problems and procedures of dealing with the complex watersheds. The present analysis did not permit adequate consideration of microrelief. For example, a slope length of 500 feet will erode differently if it is simple or complex, concave or convex, or if it has micro depositional features.

P - maximum Two-year frequency, 30 minute rainfall in inches. The rainfall data was taken from a weather bureau map of the western United States developed for Musgrave's' equation. From knowledge of climatic and geographic conditions in the ORA this data was broadly interpreted as follows:

Snake River Sediments	-	0.20 inches/event
Owyhee High Plateaus	-	0.25 inches/event
Owyhee Uplands	-	-0.28 inches/event

The Musgrave erosion equation considers the average two year 30 minute rainstorm as the cause of runoff and erosion. At this rainfall acount, management practices and resulting cover can affect soil loss. This equation predicts the soil loss from average annual rainfall, which included all recorded events. The rainfall data is currently being studied. Wischmeier currently bases his rainfall on the two year six hour storm using 22 years of climatilogical information as his basis (Wischmeier, W.H. and D.D. Smith, 1978).

Application

Musgrave's equation is used to estimate soil loss from individual simple slopes. This study assumes that Musgrave's equation applies because: (1) it provides a basis to estimate sheet erosion from climatic, soil, topography, and watershed cover characteristics for areas where soil loss from sheet erosion is difficult to measure, (2) it includes cover as a primary erosion influencing factors, and it includes factors for soil, slopes gradient, slope length, and rainfall not subject to modification by usual management.

Musgrave's soil loss equation was used to calculate (1) the present erosion conditions in the ORA, (2) the worst erosion condition with o vegetative cover, and (3) the least erosion based on the best potential vegetative cover. We realize that the worst and least erosional extremes might never be achieved but they provide a range of values for evaluating the present condition and expected conditions. The extreme values were selected because they were most viable. Consideration of the extreme values allows a better perspective on soil erosion rates under present conditions. For example a site which has a range of one to ten tons/acre/year is more likely to be affected by management than one that only ranges from one to three tons/acre/year. The wider the range of extreme values the more important vegetative cover becomes.

The computer program determines soil losses by soil maping unit and land status, and summarizes soil loss by allotments, by allotment and pasture, and by allotment, pasture and land status. The program also displays the data by percent deviation from present condition, for the entire ORA.

Musgrave's equation is also used to analyze the EIS's, proposed action and the alternatives. By predicting the various 20-year cover responses from the different management opportunities, one can determine the relative individual impacts of management on erosion.

When applying Musgrave's Soil Loss Equation every independent variable must be considered before any signficant level can be applied to the results. The F, R, S, and L factors are all average model values which represent a real range. These model values are then weighted by the percentages of the individual mapping units. Weighted averages inevitably obscure some real differences and similarities between mapping units. After all values are weighted, a process called professional manipulation or data massaging is used to reconcile the calculated averages with first hand professional field observations. This first hand field experience is essential for a meaningful data analysis.

Because the equation was recommended for application on individual slopes and the averaging procedures explained above the results should not be assigned to point-specific areas. However, when applying the data to an allotment or pasture, the results are considered reasonable. The relative soi loss values, comparing one mapping unit to another, or comparing one pasture to another, is considered more reliable than computed values for composite areas. Comparing the present condition to the extreme points is most useful because it puts the data in perspective and indicate trends. The wide range between extreme values indicates how susceptible a pasture is to erosion. Musgrave's equation can also be used to compare soil loss under present conditions to soil loss under various range treatments and management alternatives.

After comparing these results with Reynolds Creek Experiment Station's field studies, it appears this model predicts soil losses similar to the USLE on many areas.

Discrepancies result from this model and Reynolds Creeks Experiment Station's data are attributed to different procedures in computing complex slope lengths and average range condition. It also appears that both the USLE and Musgrave's Soil Loss Equation overestimate soil erosion on slopes greater than 20 percent. This has been indicated in other studies and is currently one area where research on soil erosion is concentrated (Clifton Johnson 1980, personal communication). Again predicted soil losses may be slightly higher than actual losses but research results are not yet conclusive.

Sediment Yield

Eroded soil materials often move only short distances downslope before a decrease in runoff velocity causes sediment deposition. Sediment may remain in the field near where it originated, it may be deposited on lesser slopes, or it may be transported into stream channels. The ratio of gross soil loss from watershed slopes to sediment delivered at a given location in the stream system is the sediment delivery ratio for that drainage area. A general equation for computing sediment delivery ratios is not available.

Available watershed data indicate the delivery ratio varies approximately as the 0.2 power of drainage-area size, with representative values of about 0.33 for 0.5 mi^2; 0.18 for 10 mi^2; and 0.10 for 100 mi^2. There were indications that the exponent in this relationship may vary substantially for any given drainage area depending on soil texture, relief, type of erosion, sediment transport system, and areas of deposition within the watershed. Fine soil texture, high channel density, and high stream slopes generally indicate delivery ratios that are above average for the drainage-area size (Wischmeier, W.H., and D.D. Smith, 1978).

Wischmeier's delivery ratio for the ORA appeared reasonable when compared to delivery ratios from some areas in the Reynolds Creek watershed. The ratio appears to be more reliable on watersheds of smaller area. The ratio of predicted soil loss to measured sediment yield ranges from 0.4 to 0.5 for ten mi^2 watershed compared with 0.18 for generalized data. Probably the ratio was greater because of the very efficient drainage system.

After further discussion, it was concluded that excessive erosion and sediment yields are, in many cases, due to point sources like roads or other construction sites. These problem areas often exceed the normal sheet erosion values.

Discussion

Impacts from soil erosion are highly variable. Generally impacts from accelerated erosion are total or partial removal of the surface horizon. Eventually this will lower the soil's potential to produce vegetation. The surface horizons contain high proportions of organic matter. These horizons provide the bulk of the readily available plant nutrients, for example, nitrogen, phosphorous, sulfur, potassium etc. These horizons and nutrients are very important for germination and seedling establishment, especially for grasses and forbs.

Excessive erosion, which in turn causes excessive sedimentation, lowers water quality. Poor water quality has a direct effect on down stream fisheries, wildlife, farming, domestic water supplies, recreation, etc. For these reasons watershed stability is of primary concern for land managers.

Computation Units

Tons per acre per year (ton/acre/year) is used instead of acre feet per square mile per year (ac ft/mi^2/yr). When comparing management treatments there is a larger change in value than when comparing ac ft/mi^2/yr, and more people can understand ton/acre/year than ac ft/mi^2/yr. One ton/acre is equivalent to a removal of approximately 0.2mm of depth over one acre. One cubic yard of soil is equal to approximately 2.600 pounds. A removal of one inch of topsoil is equal to a soil loss of approximately 150 tons/acre. These calculations are based on a soil density of 1.55 gm/cm^3. This soil density is a representative figure for the ORA's surface textures. Comparing these results to Musgrave's soil loss equation is important when analyzing impacts.

Standards

Many standards have been devised for soil erosion. The soil loss tolerance (T) or the permissable soil loss has long been used for cultivated lands, for which the Musgraves equation was developed. The T is the maximum rate of soil loss in tons/acre/year, which a soil can lose and still maintain a high level of productivity. The T factor is based on soil type, soil depth, and the nature of the underlying material. As the depth of the rooting zone increases, or if the substratum is renewable, the amount of tolerated soil loss increases. A common agricultural practice that renews soils is deep farrow tillage combined with fertilization. The T factor permits soil loss up to five ton/acre/year. This system is not directly applicable to rangeland for three reasons. Tilling and fertilizing is uncommon on rangeland in the ORA. Musgrave's output is based on allotments and pastures and would be very time consuming to relate back to individual soils. Research on T factor states specifically that it is not applicable to construction sites or non agricultural uses. However, T factors have been determined by individual soil series as an indication of permissible soil loss and have been used by the Soil Conservation Service and the U.S. Department of Agriculture. The T factors by individual soil series are available at the Boise district office.

Analysis of Reynolds Creek Experimental watershed soil loss by the USLE, according to Johnson, Schumaker, and Smith, 1979, indicates that cover is so variable that a statistically significant change in erosion rates require a change of about ten percent in bare ground. Consequently, if changes in the erosion rate are less than 20 percent, the difference may be due to experimental error and not due to management or land treatment.

Analysis of soil loss by Musgraves equation in the ORA indicates that present condition erosion rates exceeded the optimum excellent condition erosion rates by an average of 25 percent. This is probably very significant based on data from the Reynolds Creek Experimental watershed.

Summary

Musgrave's Soil Loss Equation is considered to be a useful tool for analyzing sheet erosion in areas where soil loss has not been measured and where insufficient money or time is available for field measurements. A thorough knowledge of soils, topography, and cover soils is necessary to apply the equation. Musgrave's equation as used in this study is a comparative analysis and should ot be applied to point specific areas unless all factors are properly evaluated and applied to the site.

More field studies are needed to verify Musgraves equation. In the ORA, the greatest need is to further analyze the effects of complex slope length and changes in cover, especially the predicted 20-year cover values. Moreover, since current research is concentrated on application of the USLE, the BLM should switch to this system. More field studies are needed to relate these erosion rates to the sediment delivery ratios so further impact analysis is possible. Any soil loss deviation from present condition by less than 20 percent is considered not to be statistically significant.

Determining extreme values of soil loss related to present and optimum condition erosion rates is an excellent method for predicting erosional trends and the magnitude of erosion susceptibility. This erosional trend and susceptibility information is needed in our planning and management system to predict soil movement by sheet erosion. Sediment yield has not been predicted after analyzing the data and comparing it to landscape features and drainage patterns, some initial impacts on sedimentation are indicated.

Appendix Table H-1

Present and Projected Annual Erosion Rates

Allot. No.	Excellent Condition Best Possible Cover	Present Condition	Proposed Action	Alternatives 1	Alternatives 2	Alternatives 3	Alternatives 4	Alternatives 5	Worst Possible Condition No Plant or Litter
	ton/acre/year	ton/acre/year	% 1/	% 1/	% 1/	% 1/	% 1/	% 1/	ton/acre/year
Intensive Management									
450	0.65	0.85	24	22	12	24	24	22	2.58
500	0.32	0.45	8	19	0	12	5	0	1.12
501	1.86	2.41	7	19	0	12	5	0	3.88
502	1.72	2.21	0	19	7	12	0	-12	4.24
503	0.69	1.01	7	19	12	12	5	0	3.81
505	1.49	1.89	12	19	21	21	10	21	8.48
506	0.84	1.19	7	19	0	12	5	0	5.20
507	1.18	1.57	7	17	0	12	5	0	6.81
508	0.99	1.32	12	19	7	22	10	12	4.14
509	1.38	1.70	12	18	18	18	10	18	8.35
513	0.42	0.62	0	21	0	13	0	0	1.48
514	0.42	0.50	0	17	0	12	0	0	1.70
515	1.48	1.87	7	18	12	12	7	22	7.77
516	1.45	1.91	12	19	5	22	10	12	6.72
517	1.00	1.42	13	21	13	23	10	13	3.49
518	0.78	0.92	7	15	-7	12	5	-12	3.32
519	0.76	1.02	7	18	5	22	5	12	3.36
521	0.72	0.95	7	19	5	22	5	12	3.60
522	0.67	0.89	0	17	0	12	0	0	2.57
525	1.25	1.50	2	15	0	5	0	0	6.76
526	0.94	1.13	12	16	5	16	7	12	4.41
529	0.99	1.31	7	17	0	12	5	0	5.16
530	1.45	1.89	7	19	12	12	5	12	8.67
531	1.24	1.60	7	17	-7	12	5	-12	7.43
532	0.68	0.90	8	19	6	24	6	13	1.95
533	0.75	1.06	7	18	-7	12	5	-12	4.24
534	0.22	0.27	12	19	5	19	10	12	0.78
535	0.31	0.45	14	21	6	23	11	14	0.90
536	0.44	0.60	8	19	0	12	5	0	1.46
539	0.66	0.83	7	17	0	12	5	0	2.31
540	0.62	0.79	7	17	0	12	5	0	1.86
541	1.19	1.53	12	18	5	23	10	12	5.94
542	0.50	0.64	0	17	0	12	0	0	1.29
546	0.55	0.70	12	19	5	23	10	12	1.96
548	0.67	0.83	12	18	5	19	10	12	1.84
549	0.30	0.41	12	19	5	23	10	12	1.08
550	0.51	0.64	12	18	5	19	12	12	1.91
551	0.43	0.54	12	19	5	20	10	12	1.11
552	0.43	0.58	23	19	5	23	23	13	2.35
553	0.26	0.39	13	23	6	24	11	13	1.09
554	0.64	0.86	7	18	0	12	5	0	2.67
556	1.52	2.04	7	18	0	12	5	0	7.49
557	0.91	1.15	0	18	0	12	0	0	5.47
Intensive Management (cont.)									
562	0.61	0.81	12	24	23	23	10	25	3.65
563	0.96	1.19	12	19	5	23	10	12	5.72
565	0.81	1.09	12	19	5	23	10	12	4.63
568	0.81	1.08	13	25	25	24	11	25	2.89
569	1.02	1.41	7	17	0	12	5	0	4.73
570	0.62	0.92	5	20	5	24	3	12	4.30
571	0.28	0.41	9	20	14	14	6	14	0.98
572	0.84	1.08	7	17	0	12	0	0	5.09
573	0.51	0.64	7	17	0	12	5	0	2.16
574	0.54	0.71	7	17	5	12	5	-12	1.62
578	0.11	0.16	0	22	0	25	0	14	0.46
579	0.83	1.20	12	21	5	23	10	12	3.95
580	0.92	1.35	7	22	0	12	5	0	5.97
581	0.81	1.15	7	21	0	12	5	0	3.90
585	0.35	0.48	0	18	-8	13	0	-14	0.98
587	1.55	1.89	7	21	-7	12	5	-12	4.82
588	1.07	1.49	8	18	-8	13	5	-13	4.06
589	0.74	1.09	8	18	-8	13	5	-12	5.53
590	0.48	0.76	8	18	-8	14	6	-12	4.70
593	0.52	0.61	13	13	13	13	10	13	1.10
595	0.79	0.95	7	14	0	17	5	12	3.72
597	1.70	2.19	0	17	0	12	0	0	9.74
599	1.71	2.28	8	18	5	13	5	0	4.78
600	1.01	1.16	12	12	12	14	10	12	5.21
601	1.17	1.53	7	17	0	12	5	0	3.77
602	0.62	0.75	7	17	-5	12	5	-12	1.59
603	0.48	0.60	10	19	0	20	5	5	2.13
Less Intensive Management									
510	2.15	2.69	7	18	0	12	7	0	4.15
520	1.32	1.79	8	19	5	26	8	13	5.23
544	1.28	1.52	5	16	7	12	5	-12	7.46
558	1.20	1.59	7	18	0	12	7	0	7.67
559	1.46	1.91	7	18	0	12	7	0	3.79
560	0.66	0.96	7	20	0	12	7	0	3.80
561	1.01	1.37	12	24	22	22	12	26	4.26
564	0.84	1.05	8	19	5	12	8	0	4.40
576	1.63	2.10	13	20	13	22	13	13	4.93
586	0.83	1.21	7	21	-7	12	7	-12	5.38
591	1.22	1.61	7	19	0	12	7	0	3.83
592	0.49	0.71	7	21	0	12	7	0	1.55
594	0.68	0.80	7	14	-7	12	7	-14	3.09
596	1.11	1.31	8	15	5	12	8	0	4.23
598	0.49	0.72	8	22	0	13	8	0	1.86

H-1 cont.

Allot. No.	Excellent Condition Best Possible Cover ton/acre/year	Present Condition ton/acre/year	Proposed Action % 1/	Alternatives 1 % 1/	Alternatives 2 % 1/	Alternatives 3 % 1/	Alternatives 4 % 1/	Alternatives 5 % 1/	Worst Possible Condition No Plant or Litter ton/acre/year
Management with Private Lands									
453	0.50	0.67	25	23	0	25	25	25	2.38
454	0.69	0.92	24	17	0	24	24	24	2.29
455	2.19	1.70	22	17	0	22	22	22	3.50
456	1.07	1.41	22	19	0	22	22	22	2.59
457	1.82	2.38	23	17	0	23	23	23	3.76
458	1.61	1.96	18	18	0	18	18	18	3.09
459	1.46	1.96	26	23	0	26	26	26	3.79
461	0.10	0.14	23	21	0	23	23	23	0.48
463	0.16	0.20	22	20	0	23	23	23	0.77
464	0.70	0.96	22	20	0	22	22	22	3.99
465	0.65	0.85	22	20	0	22	22	22	3.03
466	0.20	0.27	22	20	0	22	22	22	1.08
467	0.33	0.44	24	21	0	24	24	24	2.47
469	0.60	0.77	22	20	0	22	22	22	3.65
470	1.26	1.63	22	19	0	22	22	22	3.79
471	0.72	0.94	22	20	0	22	22	22	3.90
472	1.56	2.05	22	20	0	22	22	22	8.71
473	0.93	1.33	23	21	0	23	23	23	3.99
476	0.65	0.81	19	17	0	19	19	19	4.01
477	1.73	2.07	16	16	0	16	16	16	10.38
479	1.15	1.33	14	14	0	14	14	14	3.17
483	0.94	1.33	23	20	0	23	23	23	6.56
485	0.59	0.77	25	20	0	23	23	23	1.70
486	0.39	0.63	27	21	0	27	27	27	1.24
487	1.92	2.57	22	20	0	22	22	22	8.11
491	0.33	0.48	22	20	0	22	22	22	1.89
492	0.15	0.23	24	21	0	24	24	24	0.94
504	1.00	1.44	0	17	-8	12	0	-13	5.23
511	0.49	0.82	10	23	-9	18	10	-14	5.66
523	1.04	1.36	0	17	12	12	0	12	5.45
537	1.06	1.46	7	18	0	12	7	0	3.51
543	1.77	2.31	7	17	0	12	7	0	3.69
545	0.63	0.85	7	18	0	12	7	0	3.89
555	1.92	2.50	8	18	0	13	8	0	5.39
566	0.78	1.06	12	19	5	23	12	12	3.72
567	1.50	1.71	7	12	2	12	7	0	8.99
575	0.50	0.62	13	19	13	19	13	13	1.96
577	0.96	1.27	0	17	0	12	0	0	3.82
582	0.60	0.88	7	21	0	12	7	0	1.84
606	0.87	1.08	0	18	-7	13	0	12	3.05
607	1.54	2.19	8	18	-9	12	8	-15	8.47
608	1.08	1.45	7	19	-8	12	7	-14	6.28
609	1.28	2.01	8	21	27	14	8	27	7.00
610	0.72	0.98	7	18	0	12	7	0	1.72

Allot. No.	Excellent Condition Best Possible Cover ton/acre/year	Present Condition ton/acre/year	Proposed Action % 1/	Alternatives 1 % 1/	Alternatives 2 % 1/	Alternatives 3 % 1/	Alternatives 4 % 1/	Alternatives 5 % 1/	Worst Possible Condition No Plant or Litter ton/acre/year
Management with Private Lands (cont.)									
611	0.61	0.78	8	18	0	12	8	0	1.59
612	1.00	1.26	0	17	0	12	0	0	5.26
613	0.53	0.69	7	19	0	12	7	0	2.17
616	0.88	1.16	7	17	0	12	7	23	5.16
618	0.80	1.19	0	21	0	12	0	0	5.60
619	1.11	1.28	8	13	13	13	8	13	4.01
620	0.39	0.50	8	17	0	12	8	0	1.19
621	0.79	0.96	8	16	0	12	8	3	4.33
623	1.11	1.42	7	17	0	12	7	21	6.52
624	1.07	1.33	7	17	12	12	7	19	4.83
625	1.06	1.45	0	18	0	13	0	0	2.77
626	0.84	1.11	0	17	0	12	0	0	3.77
627	1.20	1.46	12	16	12	12	12	17	6.99
Total average ton/ac/yr	0.84	1.12	1.02	0.92	1.08	0.93	1.04	1.05	3.56
Total % improvement from present condition erosion rates	25%	0	9%	18%	4%	17%	7%	6%	-218%

1/ Percentage figures reflect the percent increase or decrease in annual erosion rates (tons/acre/year) from the present situation.

Appendix Table H-2
Land Treatment and Range Seeding Suitability Rating

I. Climatiic Limitations	Precipitation	Good	Fair	Poor	Very Poor
A. Mesic Temperature Regime (<5200' elevation) (MAST 47-59°F)					
1. Aridic-Typic (usually dry by July 1st) (ppt)		--	--	--	6-10"
2. Aridic bordering Xeric (ppt)		13-14"	10-13"	9-10"	<9"
3. Xeric - Typic (usually dry by mid August) (ppt)		12-14"	--	--	--
B. Frigid Temperatures Regime (5200 to 6500' elevation) (MAST 32-47°F & MSST >59°F)					
1. Aridic (ppt)		--	--	--	--
2. Aridic bordering Xeric (ppt)		12-14"	10-12"	<10"	--
3. Xeric (ppt)		12-20"		--	--
C. Cryic Temperature Regime (>6500' elevation) MMAST 32-47°F & MSST <59°F)					
1. Aridic (ppt)		--	--	--	--
2. Aridic bordering Xeric (ppt)		--	--	--	--
3. Xeric (ppt)		>18"	--	--	--
II. Soil Limitations					
A. Rooting depth to restrictive layer in inches (bedrock - soft or hard, hardpan)		>30"	20-30"	10-20"	<10%
B. Rock fragments in the Surface 6" (by volume)					
1. Gravels (2mm to 3 inches)		<15%	15-35%	35-50%	>50%
2. Cobbles (3 to 10 inches)		<10%	10-20%	20-35%	>35%
3. Stones (10 to 24 inches)		<3%	3-10%	10-25%	>25%
4. Rock fragments below 6 inches to 5 feet or the restrictive layer whichever is shallower		<35%	35-60%	60-85%	>85%
C. Available Water Holding Capacity (AWC) inches					
1. Surface 10 inches		>1.0	1.0-0.90	0.70-.90	<0.70
2. Profile (from 10 inches to 5 feet or the restrictive layer whichever is shallower)		>4.0	2.5-4.0	1.5-2.5	<1.5
D. Abrupt Texture change in inches		>20"	10-20"	5-10"	<5"
E. Surface Textures in the top 6" mixed fine earth fraction <2mm particle size		fsl, l, vfsl,sil scl	sl, sicl cl, lvfs cosl	lfs, ls, c(fine), sic	all sand lcos, very c(fine)

	Good	Fair	Poor	Very Poor
F. Slope groups based on K factor erodibility groups				
1. low <0.20	0-20%	20-30%	30-40%	>40%
2. moderate 0.20 to 0.40	0-15%	15-25%	25-35%	>35%
3. high >0.40	0-5%	5-10%	10-20%	>20%
G. Salt and Alkali				
1. Mm has Salt(electrical conductivity)	<2.0	2.0-3.0	3.0-4.0	>4.0
EC x 10^3 at 25^oC	<2.0	2.0-4.0	4.0-8.0	>8.0
a. Surface 12 inches				
b. From 12 to 25 inches				
2. Exchangeable Sodium % ESP $\frac{Na^+ \times 100}{Na^+ + Ca^{+2} + K^+}$				
a. surface 12 inches	<5%	5-10%	10-15%	>15%
b. pH	<8.0	8.0-8.2	8.2-8.4	>8.4

APPENDIX I

Cultural Resources Background and Methodology

The density, diversity, distribution and condition of cultural resources in the Owyhee Resource Area (ORA) were determined using a combination of inventory techniques. These included a literature search, an examination of Boise district and State Historic Preservation Office (SHPO) files to determine the location and character of sites previously recorded (Class I inventory), and a field inspection which consisted of a ten percent stratified random sample of the 1,300,000 acres of federal land included in the ORA. A total of 131,200 acres were inventoried using Washington Office guidelines, and 271 cultural resource sites were located (Class II inventory). The information obtained through the inventory process may be summarized as follows:

The ORA was occupied by prehistoric populations from about 7000 B.C. until about 1880 A.D. when the last of the tribes were moved to reservations. Archaeological sites generated by these groups indicate the earliest inhabitants belonged to a culture type known as the Desert Tradition, which probably spread through the Snake River plain and surrounding uplands from the Great Basin. These people were hunters and gatherers, who manufactured stone implements such as projected points used with the atlat or spear-thrower (and in later times the bow and arrow), knives, drills, scrapers, etc.; and seed and root grinding implements. They constructed stone hunting blinds in talus slopes and along the rim of buttes and other likely hunting spots. Shelters were constructed using poles and brush and sometimes covered with hides. Natural shelters, such as caves or rock overhangs, were utilized. Residence changed seasonally, alternating between lower, more protected areas near major drainages during the winter, and moving to higher elevations near springs during the summer.

The first nonaboriginal explorers to set foot in the ORA were fur trappers in search of beaver pelts. This began with Hunt's party which passed through the Snake River country on their way to Astoria in 1811. These fur trappers began exploration of the Oregon Trail in Idaho in 1811-12 and 1824-29. After 1840, emigrant traffic increased, and by 1884, when rail service became available as a substitute for the overland road, about 250,000 people had travelled the Oregon Trail.

While no specific sites of early settlement are known prior to 1840 in the ORA, it is virtually certain that numerous campsites, possibly including cabins or other semipermanent structures, were erected by trappers and explorers along the Snake and Owyhee river drainages.

Mineral exploitation began in earnest in the ORA with the discovery of gold on Reynolds Creek in 1862. This provided the stimulus for the growth of Silver City, Delamar, and associated support activities such as freighting, road construction, ferries, agriculture and livestock operations.

The cattle industry came to the ORA in the 1860s when the first herds of longhorns were driven in from Texas by Con Shea and G.T. Miller. These early commercial ventures provided a base for continued cattle and sheep ranching as well as generating a colorful part of the history and folklore of the ORA. Sheepherding attracted emigrants from Scotland, Ireland and Spain, and their descendants have retained much of their ethnic identity. This is an important element in the fabric of modern Owyhee society.

Prehistoric sites in the EIS area may be grouped according to activity and season of use. These consist of village or camp sites and associated temporary hunting and gathering camps, quarrys, and tool manufacturing sites, rock shelters and rock alignments, rock art and isolated artifacts. These sites tend to cluster within two distinct elevation zones: 2,600 feet and 3,300 feet, and 4,800 feet and 6,000 feet (map 3-1). Archaeological research indicates that the higher elevations were occupied during the warmer months whereas the lower elevations, particularly canyons and other protected areas, were occupied during late fall, winter and early spring.

Historic sites in the EIS area have been categorized according to activity and settlement type. These include mining settlements, such as Silver City and Delamar, military sites, homesteads, temporary camps associated with a variety of activities such as ranching, mining, logging, and roads connecting the various activities.

The most pervasive agent of deterioration is the weathering and decay of sites due to natural forces; 276 sites or 54.8 percent of the total are suffering this type of deterioration.

Damage to sites from livestock (12.5 percent) ranks next to and contributes to weathering and decay; vandalism (9.0 percent) occupies a similar position. Scientific excavation, while contributing to scientific knowledge, has destroyed 41 sites; eight percent of the total. Other agents of deterioration, such as construction use of range facilities, road and right-of-way construction, etc., have accounted for an additional 57 sites (eleven percent) in poor or destroyed condition.

Very little professional archaeological research has taken place within the ORA, therefore it is difficult to evaluate the relative importance of individual cultural resource sites. A number of sites or areas which have unusual potential for such research, have been or will be nominated to the National Register of Historic Places to protect their integrity. These include the Guffey-Black Butte archaeological district, the Silver City and Delamar historic districts (nominated and accepted); portions of the Oregon Trail, the Lambert Table, Roostercomb Peak, Rabbit Creek, Castle Creek and Castle Butte archaeological districts, which are in the process of nomination.

APPENDIX J

Wildlife Habitat Analysis and Impact Prediction Method

The condition and abundance of wildlife populations is highly dependent upon the quality of their habitat (Dasmann 1964). Optimum food, water and cover factors will produce healthy animals, capable of surviving periods of stress. The determination of optimum or quality habitat factors for wildlife inhabiting the EIS area was largely developed through literature review. It was necessary to develop proper diets and vegetative characteristics from the literature since these factors could not be assessed in the EIS area due to existing conditions.

Major ecologic sites in the EIS area important to the wildlife species being discussed were identified. The vegetative composition of each ecological condition class was compared to the habitat requirements of each wildlife species. The amount of quality forage plants and the vegetative structural characteristics (canopy cover, density and height) were used, to select the ecological condition which best met the wildlife species habitat requirements. In most cases, the good ecological condition class provided the best wildlife habitat condition. Occasionally, a higher ecological condition class (i.e., excellent ecological condition in bighorn habitat) provided the best habitat condition. Even in these instances, the good condition class still provided many preferred forage plants and the structure was not considered adverse. Consequently, the amount of good ecological condition which was expected to occur under the proposed action and the alternatives was the major basis for predicting effects on habitats and wildlife. Grazing systems, stocking rates, and seasons-of-use were included in the final estimate of the impact to wildlife.

Except in Alternative #5, the impact of proposed vegetation treatments on wildlife was classified as beneficial because the treatment would be conducted with wildlife habitat needs incorporated in the action. Alternative #5, not incorporating multiple use requirements was the only situation where these treatments were considered adverse to wildlife.

Habitat condition predictions were not made on public lands which will be managed with private lands. These lands constitute two or less percent of the habitat for any of the species discussed. Management of these lands is the responsibility of the permittee unless very serious problems develop. Therefore making predictions on habitat response is not possible since BLM only governs AUM allocation and not season-of-use.

Appendix Table J-1
Existing Mule Deer Population Estimates by Geographical Areas, Owyhee Resource Area (source: IDF&G).

Geographic Locality	Season-of-Use	Estimated Population*
West Sands Basin-Shares Basin Winter Range	Yearlong (YL) Dec.-Feb.	50R 50S
Hardtrigger-Wilson Peak Winter Range	Yearlong (YL) Dec.-Feb.	40R 60S
Black Mountain Winter Range	Yearlong (YL) Dec.-Feb.	40R 60S
Oreana-Sinker Creek Winter Range	Yearlong (YL) Dec.-Feb.	40R 60S
North Owyhee Summer Range (T4S - North)	Mar.-Nov.	400S
McBride-Jackson Winter Range	Yearlong (YL) Dec.-Feb.	50R 250S
Boulder Creek Winter Range	Yearlong (YL) Nov.-Mar.	40R 535S
North Owyhee Summer Range (T4S - South T6 & T7)	Apr.-Oct.	500S
Boulder Creek Winter Range	Yearlong (YL) Nov.-Mar.	25R 175S
Boulder Creek Winter Range	Yearlong (YL) Nov.-Mar.	40R 460S
Boulder Creek Winter Range	Yearlong (YL) Nov.-Mar.	40R 460S
Boulder Creek Winter Range	Yearlong (YL) Nov.-Mar.	40R 60S
South Mtn.-Indian Meadows-Burghart Summer Range	Apr.-Oct. May -Oct.	375S 150S
Sheep Creek-Dougal-Cherry Creek Winter Range	Yearlong (YL) Nov, Dec, Mar, Apr.	300R 150S
Trout Springs Summer Range	May -Nov.	500S
Bull Basin-Sheep Hills Winter Range	Yearlong (YL) Dec.-Apr.	200R 350S
Oregon Winter Range	Yearlong (YL) Jan.-Feb.	60R 450S

* Figures represent populations on both private and BLM lands.
R - Resident Deer
S - Seasonal Deer
1880 - Mule Deer on Summer Range/BLM Land
2905 - Mule Deer on Winter Range/BLM Land

Appendix Table J-2
Existing Ecological Condition of Selected Wildlife Habitats
in the Owyhee EIS Area

Species	Total Acres	Ecological Condition in acres/(%) Good	Fair	Poor
Mule Deer				
Summer	413,400	20,670/5%	152,092/38%	235,638/57%
Winter	394,000	27,580/7%	145,780/37%	220,640/56%
*MPL	22,300	1,338/6%	10,704/48%	10,258/46%
Antelope	427,500	21,375/5%	158,175/37%	247,950/58%
*MPL	10,600	848/8%	4,558/43%	5,184/48%
Bighorn Sheep	7,800	5,382/69%	2,028/26%	390/5%
Sage Grouse				
Nesting Habitat	187,600	7,504/4%	69,412/37%	110,684/59%
Other Use Areas	414,300	33,144/8%	174,006/42%	207,150/50%
*MPL	18,900	1,134/6%	8,316/44%	9,450/50%
Meadow/Riparian Assoc. Wildlife	9,700	485/5%	8,730/90%	485/5%

* Management with private lands.

Appendix Table J-3
Existing Antelope Population Estimates by Geographical Areas
Owyhee EIS Area (source: IDF&G)

Geographic Locality	Season-of-Use	Estimated Population*
Sands Basin - McBride Creek	YL	75
Succor Creek - Cow Creek	YL	225
Jordan Creek - Triangle	Sp,Su,Fa	250
Rabbit Creek	YL	40
Sinker - Castle	YL	40
Whitehorse	YL	50
Cottonwood Creek Field	Sp,Su,Fa	25
Deep Creek	Sp,Su,Fa	10
Bull Basin	Sp,Su,Fa	30
Lambert Table	YL	45
TOTAL	Owyhee EIS Area	790

* Figures represent populations on both private and BLM lands.
725 - Antelope on BLM lands.

APPENDIX K

Fisheries Inventory Methods and Analaysis of Data

I. Physical Habitat Condition

A physical habitat condition rating system for fisheries was compiled based on existing habitat rating systems, local geographic conditions and existing information on the interrelationship of fisheries and stream physical factors. This rating system was based on the following physical factors: 1) high streambank cover (percent shading), 2) low streambank cover (percent bare soil), 3) streambank stability (percent banks with active erosion), 4) stream channel stability (percent lateral channel movement), 5) sedimentation (percent fines covering stream bottom) and 6) in-stream cover (percent fish cover). Each of these factors was rated as excellent, good, fair or poor with criteria defined for each category as shown by the enclosed sample data sheet. Each rating category was given a numerical score for each of the six factors and the total numerical score for each site was tallied to determine the overall rating of the area inventoried. A representative area of .1 mile for every BLM administered mile or where noticeable changes in habitat condition occurred along each stream was rated.

II. Ungulate Use

Linear pellet transects parallel to the streambank were used as estimates of the amount of ungulate use riparian areas were receiving. Types and numbers of pellet groups in the transect were converted to cattle use days per acre or cattle equivalent use days per acre as shown by the enclosed procedure. Cattle use days per acre were then converted to Acres per AUM and used to indicate actual stocking rates on riparian areas.

III. Fish Species Composition, Relative Abundance and Age and Growth

Biological sampling sites were limited to reasonably accessible stream areas. Attempts were made to conduct biological sampling in representative areas of the upper, middle and lower portion of each larger stream. In most cases, a backpack electro-shocker was used to collect fish. Fish species relative abundance was expressed as numbers of fish caught per unit effort (i.e., seconds of shockertime), especially in 1976. In 1977, fish population estimates were made using Seber and Le Cren's (1967) catch and release method for each site sampled in 1976. Since 1977 was a low-flow year, population estimates were only made prior to a noticeable pooling up of fishes in August. To compare 1976 and 1977 data, catch per unit effort was expressed along with the population estimates. Game fish were weighed for biomass estimates and scale samples along with length measurements were taken for age and growth analysis.

IV. Aquatic Insects and Other Benthic Invertebrates

Aquatic insects were sampled as indicators of water quality. Three stream bottom samples (square feet) were taken using a Surber sampler at each site sampled for fish. Insects were identified to species where possible and numbers of each species were recorded for each sample. The Shannon-Weaver diversity index (Lloyd et al., 1968) was calculated for each site and used as an indicator of community richness and water quality along with consideration of the types of organisms and their ecology. Organisms were also dried and weighed to determine fish food abundance. The following species diversity rating along with a consideration of the types of organisms collected per stream reach was used to aid in the evaluation of water quality.

Shannon-Weaver Species Diversity Rating (Wilhm, 1970)

0 - 1.9	= Poor
2.0 - 2.9	= Fair
> 3	= Good

The following rating system to evaluate fish food abundance was used (Binns, 1976), in conjunction with biomass estimates.,

Numbers/sq. ft.	Biomass(g)/sq. ft.	
≥ 500	> 1.0	Excellent
250 - 455	.5 - .99	Good
100 - 249	.1 - .49	Fair
≤ 99	< .1	Poor

V. Chemical Water Quality

Those chemical constituents commonly limiting to fisheries were tested for at each fish and aquatic insect sampling site. These constituents include pH, dissolved oxygen (Winkler azide modification method), and water temperature. Grab samples to be analyzed for other chemical constituents were usually taken on upper and lower stream portions on each of the major streams in midsummer 1976 and 1977. The State of Idaho Health laboratory analyzed all grab samples.

VI. Pellet Transects

To determine the relative amount of ungulate use by species in riparian areas, a 1/13-acre belt transect (225 yards long by 5 feet wide) was used. Big game and/or the domestic sheep pellet groups and cattle and horse droppings were recorded by species of animal. Cattle and horse droppings and big game and domestic sheep droppings were converted to comparable units based on defecation rates for each species as reported in the literature.

The number of cattle droppings were multiplied by 1.08 to get cattle use days per acre, and horse droppings were multiplied by 1.25 to get horse equivalent cattle use days per acre.

The number of domestic sheep or big game species pellet groups were divided by the following number to convert to cattle use days per acre.

Species	Conversion No.	Species	Conversion No.
Domestic sheep	5	Whitetail deer	5
Mule deer	4	Antelope	5
Bighorn sheep	5	Elk	1.5
Moose	1		

In areas occupied by domestic sheep and/or deer and antelope, the livestock grazing permit was reviewed for a basis of estimating the use by the species since domestic sheep, bighorn sheep, deer and antelope droppings are extremely difficult to differentiate.

The converted big game units and/or domestic sheep units and cattle use days per acre were summed to get the total use days for the subject area. The percentage use days by grazing ungulate species was then calculated.

STREAM HABITAT CONDITION RATING SYSTEM

	EXCELLENT	GOOD	FAIR	POOR
1) High Stream bank cover % shading	4 more than 80% shading	3 60% to 80% shading	2 40% to 60% shading	1 less than 40% shading
2) Low Stream bank cover	4 veg. well rooted & over 8", sod intact-no erosion from sodded areas.	3 veg. mostly over 4", sod mostly intact with less than 10% bare soil with broken sod, some surface erosion.	2 veg. mostly less than 3" high, less than 20% bare soil, sod broken & surface erosion apparent.	1 broken sod, over 20% bare soil showing, surface erosion a serious problem.
3) Stream bank stability	4 less than 5% of banks banks with active erosion.	3 5% to 10% of banks with active erosion.	2 10% to 20% of banks with active erosion.	1 more than 20% of banks with active erosion.
4) Stream channel stability	4 no or negligible lateral channel movement & bank erosion, channel scour or changing channels.	3 up to 5% lateral movement & bank erosion, minor channel scouring & changing channels within stream bed.	2 up to 10% lateral movement, scouring & redeposition obvious, channel changes occurring.	1 more than 10% lateral channel movement & bank cutting, channel changes & scouring evident & source of extreme sedimentation.
5) Sedimentation % fine sediments-sand & smaller covering stream bottom.	4 less than 10% fine sediments.	3 10% to 15% fine sediments.	2 15% to 25% fine sediments.	1 more than 25% fine sediments.
6) In-stream cover-pools, cutbanks, boulders, debris overhanging veg., velocity breaks or turbulence.	4 over 50% of stream channel containing instream cover.	3 25% to 50% instream cover, 50% to 75% exposed.	2 10% to 25% instream cover, 75% to 90% exposed.	1 less than 10% instream cover, over 90% exposed.
	Column Total ________	Column Total ________	Column Total ________	Column Total ________

Total Numerical Score ____________

Overall Rating ____________________

Excellent = 22 to 24

Good = 16 to 21

Fair = 10 to 15

Poor = 6 to 9

Appendix Table K-1

Cattle Grazing Conflicts with Fisheries

Streams	Total Stream Miles on Public Land	Riparian Areas w/Grazing Conflicts to Fisheries			
		Degree of Conflict	Stream Miles in Conflict	Allot.	Actual* Cattle Use (Acres/AUMs)
Perennials					
Jump Cr.	7.4	Moderate	1.0	0603	
			0.8	0514	
			2.0	0521	1.1
Squaw Cr.(North)	9.1	High	2.1	0556	0.2
		Moderate	0.5	0513	0.7
Hardtrigger Cr.	7.1	Moderate	0.5	0516	0.5 to 1.3
Reynold's Cr.	9.5	High	3.3	0508	0.3
			0.3	0517	0.1
Sinker Cr.	19.7	High	3.5	0569	1.1
			1.0	0579	
		Moderate	1.1	0535	
			0.5	0578	
Castle Cr.	17.3	High	0.5	0533	0.3
			4.5	0541	0.1
Jordan Cr.	16.6	High	0.3	0570	0.2
			0.3	0569	0.4
		Moderate	2.2	0505	
			0.5	0581	
Louse Cr.	2.5	High	1.0	0580	0.1
Flint Cr.	2.7	High	0.3	0503	0.1
Boulder Cr.	13.3	High	1.0	0503	0.1 to 0.2
			1.0	0595	0.1 to 0.2
			0.8	0600	
		Moderate	0.8	0526	1.4
			0.5	0589	
Combination Cr.	4.9	High	4.3	0595	
Rock Cr.	8.2	High	1.0	0575	0.6
		Moderate	3.0	0573	

Streams	Total Stream Miles on Public Land	Riparian Areas w/Grazing Conflicts to Fisheries			
		Degree of Conflict	Stream Miles in Conflict	Allot.	Actual* Cattle Use (Acres/AUMs)
Perennials (cont.)					
Josephine Cr.	7.0	High	3.2	0502	
			0.8	0575	0.6
			2.2	0587	
Cow Cr.	1.8	High	1.0	0506	
Williams Cr.	2.2	Moderate	1.5	0505	0.4
			0.5	0509	
Succor Cr.	3.3	High	1.0	0624	
Owyhee River					
East Fork	54.1	Moderate	4.0	0551	0.8
Middle Fork	5.7	High	6.0	0539	0.2
North Fork	20.9	High	3.1	0500	0.3
			2.0	501,546	0.1
			4.0	501,548	0.1
			1.0	0539	0.2
			1.2	0520	
		Moderate	3.0	0542	
Deep Cr.	36.8	High	0.5	0548	0.1
			3.5	0549	0.1
			1.0	0550	0.1
			1.0	0599	
Currant Cr.	10.9	High	2.0	0520	0.3
			4.6	548,599 (2.4)	0.2
Corral Cr.	7.4	High	1.3	0501	0.4
			5.6	0561	0.2 to 0.7
Cabin Cr.	9.1	High	2.5	0501	0.2 to 0.6
Juniper Cr.	4.7	High	3.0	0501	0.1 to 0.4
			0.5	0561	0.4
Red Canyon Cr.	19.8	High	17.3	0539, 540(3.7), 593(1.4)	0.1 to 0.3

Streams	Total Stream Miles on Public Land	Riparian Areas w/Grazing Conflicts to Fisheries			
		Degree of Conflict	Stream Miles in Conflict	Allot.	Actual* Cattle Use (Acres/AUMs)
Major Intermittents					
Meadow Cr.	6.2	High	1.7	0533	0.1
			1.5	0534	
		Moderate	1.5	0589	
Hart Cr.	6.8	Moderate	3.3	0532	
			0.3	0588	
			1.5	0589	
Pickett Cr.	7.0	Moderate	1.0	0532	
			5.0	0588	
			1.5	0589	
Brown's Cr.	11.3	Moderate	2.0	0585	0.7
Scotch Bob Cr.	3.0	High	3.0	0569	0.3
McBride Cr.	4.3	High	1.3	0515	
			1.4	0525	
			1.6	0565	
South Mtn. Cr.	3.2	High	2.2	0600	0.3
Rose Creek	4.9	High	0.3	0587	
		Moderate	0.6	0573	0.6
Noon Cr.	9.3	High	1.5	0501	0.1
			1.7	0520	
Trout Cr.	5.5	High	1.3	0560	
			1.5	0562	

*Use by other ungulate species in the areas identified was negligible.

Appendix Table K-2
Grazing Conflicts Affecting Fisheries Habitat Factors
Relating to Stream Hydrology

Habitat Factor	Poor Rating Criteria	Intermittent Stream Miles	Perennial Stream Miles
Sedimentation*	>25% fines covering stream bottom	72.9	264
Channel Stability	>10% lateral channel movement	5.9	75.5
Bank stability	>20 banks actively eroding	54.1	139.5
Vegetative Riparian Cover	>20% of sodded areas with bare soil	47.4	160.3

* 153 stream miles on public lands have silt problems associated with onsite grazing impacts, and 184 stream miles on public lands have silt problems associated with offsite impacts.

Appendix Table K-3

Overall fisheries habitat condition on perennial and major intermittent streams

Stream Name	Overall Habitat Condition	Stream miles with fisheries problems	Conflicting Activity Uses	Physical Habitat Limiting Factors
Perennials				
Jump Creek				
Upper	P	3.8	Livestock Grazing	water depth, flow
Middle	G	.3	Recreation	silt, unstable channel banks, cover, human refuse, migration blocks
Squaw Cr. (North)				
Upper	P	6.0	Livestock Grazing, road, diversion	silt, unstable channel & banks, cover, pool depth
Middle	G	---	-------	water depth, cover
Hardtrigger Cr.				
Upper half	G	---		water depth
Lower half	P	3.5	Livestock Grazing, Wild Horses	silt, unstable channel & banks, cover, pool depth
Reynolds Creek	F	8.5	Mining, Road, Wildfire, Livestock Grazing, Diversion, Agri. use, Recreation	water pollution, silt, pools, cover, migration blocks
Sinker Creek	P	18.5	Livestock Grazing, Culvert install., Road x-ing, Beaver	water depth, cover, unstable channel, silt, migration block
Castle Creek				
Main Branch	G	---	Mining, Road, Road x-ing	silt
N. Fork	P	8.4	Livestock Grazing, Road, Construction, Beaver	silt, unstable banks, cover, pool depth
Jordan Creek	F	11.9	Road, Mining, Recreation, Beaver, Culvert install., Livestock Grazing	water pollution, silt, unstable banks, migration blocks
Louse Creek	P	5.0	Mining, Livestock Grazing	water pollution, silt, unstable channel & banks, cover
Flint Creek	P	2.7	Mining, Livestock Grazing, Diversion, Road	silt, water pollution, cover, pool depth, migration block
Boulder Creek				
Middle Fork	P	7.0	Livestock Grazing, Diversion	silt, flow
South Fork	F	2.9	Livestock Grazing, Road, Beaver	silt, cover, pool depth
North Fork	G	---	Road	silt, water depth
Combination Cr.	P	4.3	Livestock Grazing, Diversion	silt, water depth, cover
Rock Creek	P	6.9	Livestock Grazing, Diversion, Road x-ing, Beaver	silt, flow, migration blocks
Josephine Creek	P	7.0	Livestock Grazing	silt, flow, pools, cover
Cow Creek	P	2.0	Livestock Grazing	water depth, cover
Williams Creek	F	2.0	Mining, Livestock Grazing, Road, Beaver	water depth, cover, water pollution
Succor Creek	P	3.3	Livestock Grazing, Mining, Construction	silt, cover, pool depth, flow
Owyhee River				
East Fork	F	38.7	-------	silt, late summer flow, algal growth, warm water
Middle Fork	F	5.7	Livestock Grazing	silt, unstable banks & channel, pools, cover, flow
North Fork	F	20.4	Livestock Grazing	silt, cover, unstable banks, pools

Stream Name	Overall Habitat Condition	Stream miles with fisheries problems	Conflicting Activity Uses	Physical Habitat Limiting Factors
Perennials (cont.)				
Squaw Cr. (South)	F	7.4	Livestock Grazing	silt, pools & pool depth
Deep Creek Upper	P	19.5	Livestock Grazing	silt, cover, banks & channel unstable, flow
Lower	F	17.3	-------	flow, silt, channel unstable, cover, algal growth
Currant Creek	P	9.0	Livestock Grazing, Diversion, Road, Construction	silt, flow, migration block, cover, pools, unstable banks
Nickel Creek	P	9.9	Livestock Grazing, Beaver	silt, flow, algal growth, unstable banks, pools, cover
Corral Creek	P	7.4	Livestock Grazing, Rd. x-ing	silt, cover, unstable banks, pools
Cabin Creek	P	9.3	Livestock Grazing, Rd. x-ing	silt, cover, unstable banks, pools
Juniper Creek	P	4.4	Livestock Grazing, Diversion, Road x-ing	silt, pools unstable banks, cover
Red Canyon Cr.	P	19.1	Livestock Grazing	silt, unstable banks, cover, pools
Total BLM miles of perennials in conflict		268.0		
Major Intermittents				
Meadow Creek	P	6.2	Past Mining, Diversion, Livestock Grazing	silt, pools, flow, algal growth, unstable banks, mine tailing, channel alteration, migration block
Wilson Creek	P	10.4	Livestock Grazing, Road	water depth, silt, unstable banks
Hart Creek	F	6.8	Road x-ing	silt, pools, cover, unstable banks
Pickett Creek	F	7.0	Road x-ing	water depth, silt, pools, cover
Brown's Creek	P	11.3	Livestock Grazing	silt, water depth, pools, cover
Salmon Creek	P	3.2	Diversion, Livestock Grazing	flow, pools, cover, silt, unstable banks, migration block
Rabbit Creek	P	13.1	Road, Road x-ing	water depth, pools, cover, stream bottom & banks, channel unstable
Scotch Bob Creek	F	3.0	Livestock Grazing, Road, Recreation	water depth, unstable banks, silt
McBride Creek	P	3.5	Livestock Grazing, Road	water depth, pools, cover, unstable banks, silt, flow
South Mountain Cr.	P	3.2	Livestock Grazing, Mining	pools, cover, silt, unstable banks
Rose Creek	P	4.9	Livestock Grazing	pools, cover, silt, flow, unstable banks
Pleasant Valley Cr.	F	5.9	Livestock Grazing	water depth, silt, flow, unstable banks & channel, cover
Noon Creek Upper	P	4.2	Livestock Grazing	water depth, flow, cover, unstable banks, silt
Lower	F	2.4	-------	water depth, flow
Trout Creek	P	5.5	Diversion	pools, silt, unstable banks

Total BLM miles of major intermittents in conflict = 90.6 miles

Appendix Table K-4
Potential Water Quality Limiting Factors

Streams	Factor : Criteria: Temp. (>65°F)	pH (<5 >9)	Dis. Solids (>300 mg/1)	Turb. (>8 NTU's)	Dis. Oxygen (<6 mg/1)	%O_2 Sat. (<80 or >100)	Susp. Solids (>50 mg/1)	Alka-linity (<40 mg/1)	Nit-rates (>.30 mg/1)	Phos-phates (>.10 mg/1)	Mer-cury (<.5 Mg/1)
	Potential Water Quality Limiting Factors 1/										
Castle Creek	*			*						*	
Flint Creek	*										*
Scotch Bob Cr.	*										
Sinker Creek	*			*						*	
Jordan Creek	*					*		*		*	*
N.F. Owyhee R.	*	*				*		*		*	
E.F. Owyhee R.	*	*				*			*		
Squaw Cr. (S.)	*			*		*		*		*	
Boulder Creek	*							*			
Josephine Creek	*	*		*		*					
Williams Creek	*	*							*		*
Cow Creek	*								*	*	
Succor Creek	*			*						*	
Reynold's Creek	*		*		*	*				*	
Cabin Creek	*					*					
Salmon Creek	*	*									
Jump Creek			*	*					*	*	
Squaw Cr. (N.)			*	*					*		
Louse Creek						*	*		*	*	*
Rock Creek	*					*				*	
Deep Creek	*					*					
Meadow Creek	*			*		*				*	
Red Canyon Cr.	*					*				*	
Combination Cr.								*			
S. Mtn. Cr.											*
Juniper Creek	*										

1/ Other physical habitat limiting factors not considered above such as silt and flow are contained in Appendix Table K-6. Other chemical constituents analyzed in the streams above but not found to be limiting factors include hardness, total solids, iron, lead, manganese and megnesium.

Appendix Table K-5

Overall stream community richness and water quality as reflected by aquatic macro-invertebrate diversity.

Stream		Diversity Index	% Composition Caddis-fly	May-fly	Stone-fly	Bee-tles	2 Winged Flies	Overall Community Richness	Water Quality Indication
Jump Creek	(lower)	2.45	41	-	-	28	22	Fair	Fair
	(middle)*	3.14	45	20	-	20	-	Good	Fair
Squaw Cr. (N.)	(lower)	2.35	48	-	-	37	-	Fair	Fair
	(middle)	1.93	82	-	-	12	-	Poor	Fair
	(upper)	2.55	28	11	-	39	5	Fair	Fair
Hardtrigger Cr.		1.53	-	56	-	-	39	Poor	Fair
Reynold's Cr.	(upper)	2.90	11	30	-	16	25	Fair	Fair
	(lower)	2.78	41	18	-	26	5	Fair	Fair
Sinker Creek	(lower)*	2.40	70	4	-	6	-	Fair	Fair
	(upper) 76&77*	3.45	6	7	-	13	9	Good	Fair
	78	1.90	-	12	-	-	84	Poor	Fair
Castle Creek	(lower)	1.98	16	-	-	-	74	Poor	Fair
	(upper)*	2.87	70	13	-	-	3	Fair	Fair
Jordan	(upper)*	3.22	48	35	-	-	3	Good	Good
	(middle)*	3.56	12	46	-	-	23	Good	Good
	(lower) 76	1.92	10	71	-	-	-	Poor	Fair
	77	2.83	72	-	-	-	-	Fair	Fair
Flint Creek	(lower)*	2.30	7	5	-	38	33	Fair	Poor
Boulder	(middle)*	3.41	62	9	-	8	-	Good	Fair
	(N.F.)*	2.77	33	-	-	43	-	Fair	Fair
	(S.F.)	2.78	40	-	-	30	-	Fair	Fair
Combination Cr.	(lower)*	3.29	28	16	-	22	6	Good	Fair
Rock Creek	(lower)	3.19	43	32	-	15	-	Good	Fair
Josephine Cr.	(lower)	2.61	-	15	-	56	-	Fair	Poor
Cow Creek	(upper)*	3.38	26	28	3	-	29	Good	Fair
Williams Creek	(upper)*	2.13	31	22	-	-	35	Fair	Fair
	(lower)*	2.17	37	6	-	3	11	Fair	Fair
Succor Creek	(lower)	2.74	41	-	-	-	39	Fair	Fair
E.F. Owyhee R.		3.34	-	24	-	-	54	Good	Fair
Owyhee River		3.46	29	57	-	-	-	Good	Fair
N.F. Owyhee R.	(lower)*	2.86	46	26	-	2	16	Fair	Fair
	(middle)	2.34	71	-	-	6	9	Fair	Poor
Deep Creek	(lower)	2.65	54	-	-	-	29	Fair	Poor
	(upper)*	2.34	-	7	17	32	36	Fair	Fair
Currant Creek	(lower)	3.66	20	54	14	-	-	Good	Good
Corral Creek	(lower)*	2.62	52	15	-	-	14	Fair	Fair
Cabin Creek	(lower)*	2.21	47	-	-	-	8	Fair	Poor
Juniper Creek	(lower)*	2.08	77	-	-	-	3	Fair	Fair
Red Canyon Cr.	(lower)	2.21	20	-	-	-	62	Fair	Poor
Meadow Creek	(upper)	2.61	56	-	-	-	23	Fair	Fair
Hart Creek	(upper)	2.14	-	-	64	-	34	Fair	Fair
Pickett Creek	(upper)	1.59	-	10	-	-	89	Poor	Poor
Brown's Creek	(upper)	1.61	-	-	-	-	90	Poor	Poor
Salmon Creek	(lower)	1.61	88	-	-	5	-	Poor	Fair
	(upper)	2.39	43	-	-	38	-	Fair	Fair
S. Mtn. Creek	(upper)	3.38	15	52	-	-	-	Good	Good

* Indicates a mean diversity index from summer values collected from 1976-78.

Appendix Table K-6
Distribution and Relative Abundance of Fish Species in the EIS Area

Species	Distribution	Miles of Habitat Occupied	Relative Abundance*
White Sturgeon (sensitive sp.)	Snake River	65	U-C
Redband Trout (sensitive sp.) and/or Rainbow Trout	Widespread	259	C-A
Coho Salmon	Snake River	52	O
Brook Trout	Upper Jordan Creek	5	X
Mountain Whitefish	Snake R. & Owyhee R.	92	O,U
Smallmouth Bass	Snake R. & Owyhee R.	73.5	C,U
Largemouth Bass	Snake River	52	U
Black Crappie	Snake River	52	C
Channel Catfish	Snake River	52	C
Yellow Perch	Snake River	13	C
Bluegill	Snake River	65	U
Pumpkinseed	Snake River	52	U
Black Bullhead	Snake River	65	U
Northern Squawfish	Widespread	179	C
Speckled Dace	Widespread	302	A
Longnose Dace	Owyhee R., Squaw Cr., Snake R., Boulder Cr.	102	C
Bridgelip Sucker	Snake River	52	C
Largescale Sucker	Widespread	297	A
Chiselmouth	Widespread	148	C
Peamouth	Snake River	65	U
Tadpole Madtom	Snake River	52	U
Redside Shiners	Widespread	187	A
Mottled Sculpin	Snake R., Owyhee R., Jordan Cr., Boulder Cr.	104	C
Torrent Sculpin	Deep Creek	26	U
Piute Sculpin	N. Fk. Owyhee R., Squaw Cr., Red Canyon Cr., Currant Cr.	52	U
Carp	Snake R., Owyhee R.	87	C,U

* A - Abundant; a common species which is very numerous in suitable habitat.
C - Common; certain to be seen in suitable habitat.
U - Uncommon; present but not certain to be seen. May occur only locally.
O - Occasional; seen only a few times during a season.
X - Accidental; seen only once or twice; out of normal range.

Appendix Table K-7
Present Estimated Numbers and Biomass of Trout Per Surface-Acre.

Stream		Population Estimates (#'s/surface acre ± 95% CI)	Biomass Estimates (lbs/surface acre ± 95% CI)	Size (inches) Range	Mean
Jump Cr.	(middle)		4 lbs/hr.*	1.0-7.0	5.2
Reynolds Cr.	(upper)	755 ± 170	2 ± 0.01	0.5-4.5	1.3
Sinker Cr.	(lower)	>29	4 lbs/hr.*	2.0-8.7	4.4
	(upper)	164 ± 40	13 ± 0.1	4.5-8.0	5.6
Castle Cr.	(upper)	723 ± 150	33 ± 1	2.0-9.0	4.1
Jordan Cr.	(upper)	1741 ± 808	89 ± 5	2.7-9.0	4.8
		59 ± 22	11 ± 0.2	5.9-10.8	7.7
	(middle)	134 ± 33	8 ± 0.1	4.0-8.6	5.3
Flint Cr.	(lower)	>40	0.9 lbs/hr.*	1.0-5.2	2.4
Boulder Cr.	(middle)	30 ± 0	5 ± 0	7.3-8.1	7.7
	(N.F.)	404 ± 244	9 ± 1	1.5-6.2	3.6
	(S.F.)	2675 ± 597		1.2-7.5	4.2
Combination Cr.	(lower)	2296 ± 88	175 ± 1	3.7-8.4	5.9
Cow Cr.	(upper)	257 ± 45	2 lbs/hr.*	3.2-7.4	4.3
Williams Cr.	(upper)	254 ± 27	9 ± 0.3	3.3-5.4	4.0
	(lower)	723 ± 75	42 ± 0.2	3.6-6.6	5.2
Deep Cr.	(upper)	571 ± 233	44 ± 16	3.6-7.4	5.1
Corral Cr.	(lower)		0.1 lbs/hr.*		
Cabin Cr.	(lower)		12 lbs/hr.* (pool only)	4.2-8.7	6.0
So. Mtn. Cr.	(upper)	586 ± 63	16.5 ± 0.1	2.7-6.3	3.9

* In cases where the variance of the biomass estimates are extremely high, biomass values are given as pounds of catch per hour at the sampling area.

Appendix Table K-8

Relative abundance of fish species as reflected by the no. of fish electro-shocked per second.

Streams		High .25	.15	.05	.025	Low .00
Jump Creek				Redband Trout,	Dace Suckers	
Squaw Cr. (N)	(lower)				Dace, Suckers	
Reynolds Cr.	(upper)			Redband Trout	Dace	
	(lower)				Dace, Suckers	
Sinker Creek				Redband Trout,	Dace	
Castle Creek	(upper)			Dace, Suckers,	Redband Trout	
Salmon Creek	(lower)					Redband Trout
Jordan Creek	(upper)		Redband Trout			Suckers, Dace
	(lower)	Dace,	Suckers	Shiners	Chiselmouth, Squawfish, Redhand trout	
Flint Creek		Sculpins		Redband Trout		Suckers
Boulder Creek	(N.F.)		Sculpins		Redband Trout	Dace
	(middle)		Dace	Shiners	Sculpins, Suckers Squawfish, Chiselmouth, Redband trout	
	(S.F.)		Redband Trout			
Combination Creek				Redband Trout		
Josephine Creek		Dace	Suckers,	Squawfish	Shiners	Chiselmouth, Sculpins
Rock Creek		Dace	Suckers,	Squawfish	Shiners	Chiselmouth
Cow Creek	(upper)			Redband Trout		
Williams Creek				Redband Trout		
Succor Creek				Redband Trout Dace		
N.F. Owyhee R.	(upper)				Redband Trout	
	(middle)	Dace	Suckers Shiners		Sculpins	Redband Trout
	(lower)	Chiselmouth	Suckers		Squawfish Shiners	Dace Sm. Bass
E.F. Owyhee River				Squawfish	Shiners Chiselmouth	Suckers White Fish Dace
Owyhee River			Chiselmouth	Sm. Bass Shiners	Suckers Dace	
M.F. Owyhee River				Redband Trout	Dace Shiners	
Deep Creek		Dace	Shiners	Suckers	Redband Trout	Sculpins
Current Creek				Suckers	Dace Redband Trout Sculpins	Shiners
Corral Creek			Suckers	Dace	Shiners	Redhand Trout
Cabin Creek					Dace	Redband Trout
Juniper Creek		Dace	Suckers	Shiners		Redband Trout
Red Canyon Cr.					Redband Trout	Sculpins Dace
Pickett Creek				Redband Trout		
S. Mtn. Creek				Redband Trout		
Squaw Creek					Suckers Dace Shivers	Redband Trout Sculpins

Species Abundance (#'s collected/sec.)

Appendix Table K-9

Predicted fisheries habitat condition ratings with implementation of Proposed Action

Stream	Allot.	Present Fisheries Habitat Condition	Proposed Action: Grazing System & Season-of-use	Proposed Action: Other	Stream Miles	10-Year Impact	Major Factors Contributing to 10-year impact	Predicted Resultant Fisheries Hab. Con.: 10-Year	Predicted Resultant Fisheries Hab. Con.: 20-Year
Jump Creek									
(upper)	521, 603-514	P	2RR Sp	log structures (2.5 mi.)	4.2	Slight improvement.	Veg. response from log structures	P	F
(middle)	603-514	G	2RR Sp		3.2	No Change	Inaccessible to livestock.	G	G
Squaw Creek									
(upper)	556	P	1DR S	*log structure	3.8	Improve to fair.	Veg. response from log structures & proposed system & season-of-use.	F	G
	556	P	3RR Sp		1.5	Slight improvement.	Some veg. response from proposed system and season-of-use.	P	F
(middle)	556, 513	G	3RR Sp		3.0	No Change	Inaccessible to livestock.	G	G
(lower)	513-522	F	3RR Sp	log structures	0.8	Slight improvement.	Veg. response from log structures.	F	F
Hardtrigger Creek									
(upper)	516	G	2DR S/F		3.6	No Change	Inaccessible to livestock.	G	G
(lower)	516	P	2RR Sp	log structures (1.0 mi.)	1.7	Slight improvement.	Veg. response from log structures.	P	F
	516	F	2RR Sp		1.8	No Change	Lack of veg. response from proposed system & season-of-use.	F	G
Salmon Creek									
(upper)	508	F	7DR Sp		0.5	No Change	Lack of veg. response from proposed system & season-of use.	F	F
	508	P	7DR Sp		0.8	No Change	Same as above	P	F
(lower)	508	P	7DR Sp		1.3	No Change	Lack of veg. response from proposed system & season-of-use.	P	F
	508	F	7DR Sp		0.8	No Change	Lack of veg. response from proposed system & season-of-use.	F	F
Reynolds Creek									
(upper)	517	F	7DR Sp	*log structure (0.3 mi.)	2.3	No Change	Lack of veg. response from proposed system & season-of-use.	F	F
(lower)	508	P	7DR Sp	log structures	2.0	Slight improvement.	Veg. response from log structures.	P	F
	508	F	7DR Sp	*log structure (1.5 mi.)	4.1	Slight improvement.	Veg. response from log structures.	F	F
	508	G	7DR Sp		1.1	No Change	Fairly inaccessible to livestock.	G	G
Sinker Creek									
(upper)	569,579	P	2DR S/F	*log structure (3.5 mi.)	16.7	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	High F
(lower)	578-535	F	DR F/W	log structures	1.8	Slight improvement.	Veg. response from log structures.	F	High F
	571-535	G	DR F/W		1.2	No Change	Inaccessible to livestock.	G	G
Scotch Bob Creek	569	F	2DR S/F	*log structure	3.0	Slight improvement.	Veg. response from log structures.	F	G
Pickett Creek									
(upper)	588, 589	F	2DR S/F	log structures	2.0	Slight improvement.	Veg. response from log structures.	F	G
	588	F	2RR Sp	log structures	4.0	Slight improvement.	Veg. response from log structures.	F	G
(lower)	532	F	3RR Sp		1.0	No Change	Lack of veg. response from proposed system & season-of-use.	F	F
Hart Creek									
(upper)	589	F	2DR S/F	log structures	1.5	Slight improvement.	Veg. response from log structures.	F	G
	588, 532	F	2RR Sp	log structures (2.0 mi.)	2.5	Slight improvement.	Veg. response from log structures.	F	G

Appendix Table K-9 cont.

Stream	Allot.	Present Fisheries Habitat Condition	Proposed Action: Grazing System & Season-of-use	Proposed Action: Other	Stream Miles	10-Year Impact	Major Factors Contributing to 10-year impact	Predicted Resultant Fisheries Hab. Con.: 10-Year	Predicted Resultant Fisheries Hab. Con.: 20-Year
Hart Creek (cont.) (lower)	532	F	3RR Sp	log structures	2.0	Slight improvement.	Veg. response from log structures.	F	High F
Brown's & Little Brown's Creek (upper)	541	P	2DR Sp		4.5	No Change	Lack of veg. response from proposed system or season-of-use.	P	F
	588, 532	P	3RR Sp		6.5	No Change	Lack of veg. response from proposed system & season-of-use.	P	F
	585, 532	P	2DR Sp/F	log structures	3.0	Slight improvement.	Veg. response from log structures.	P	High F
(lower)	532, 535	P	3RR Sp		2.5	No Change	Lack of veg. response from proposed system & season-of-use.	P	P
Castle Creek (N.F)	533,541,602	P	3RR Sp,S F	*log structure (5.5 mi.)	8.5	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	G
(upper)	626	G	Mngmt in asstn w/ pr. land		0.5	No Change	Lack of further veg. response.	G	G
	541	G	2DR Sp		5.5	No Change	Inaccessible to livestock.	G	G
	541	G	3RR Sp S,F		1.5	No Change	Lack of further veg. response.	G	G
McBride & Little McBride Creek (upper)	515	P	2DR Sp S,F	*log structure	3.0	Slight improvement.	Veg. response from log structures.	P	F
(lower)	565	P	2DR Sp,F	*log structure	1.8	Improve to fair.	Veg response from proposed system & season-of-use &	F	F
	521	P	3RR Sp S,F	*log structure	1.0	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	F
Succor Creek (upper)	624	P	Mngmt in asstn w/ pr. land	*log structure (0.8 mi.)	1.5	Improve to fair.	Veg. response from biological use limit & log structures.	F	High F
(lower)	506, 523	P	2RR Sp		1.7	No Change	Lack of veg. response from proposed system & season-of-use.	P	F
Cow Creek	506	F	2DR S/F	*log structure	1.8	Slight improvement.	Veg. response from proposed system & season-of-use & log structures.	F	High F
Trout Creek (upper)	554	P	3RR Sp S,F	*log structure	2.0	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	F
	562	P	3DR S,F	*log structure	1.0	Improve to fair.	Same as above.	F	G
	560	P	Less int mngmt.	log structures	1.0	Improve to fair.	Same as above.	F	G
(lower)	529	P	3RR Sp S,F		1.5	No Change	No fenced proposed for system to be effective.	P	P
Jordan Creek (upper)	570, 569	P	2DR S,F	fencing	1.0	Improve to good.	Fencing	G	G
	569,580,506-562	F	2DR S,F		4.4	Slight improvement.	Veg. response from proposed system & season-of-use.	F	G
(lower)	570, 580	G	2DR S,F		2.3	No Change	No further veg. response.	G	G
	580-554	G	2DR S,F/ 3RR Sp S,F		2.3	No Change	Inaccessible to livestock.	G	G
	581, 505	F	3RR Sp S,F	*log structure	2.9	Slight improvement.	Veg. response from log structures.	F	F
	581-580	F	2DR S,F		2.4	No Change	Lack of further veg. response & other uses in area.	F	F

Appendix Table K-9 cont.

Stream	Allot.	Present Fisheries Habitat Condition	Proposed Action: Grazing System & Season-of-use	Proposed Action: Other	Stream Miles	10-Year Impact	Major Factors Contributing to 10-year impact	Predicted Resultant Fisheries Hab. Con. 10-Year	20-Year
Louse Creek	580	P	2DR S,F	fencing	2.8	Improve to good.	Fencing	G	G
Flint Creek	503	P	2DR S/F	log structures (0.3 mi.)	2.7	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	F
Williams Creek (lower)	609-509	F	Mngmt in asstn w/ pr. land		0.7	Slight improvement.	Veg. response from biological use limit, proposed system & season-of-use.	F	G
	505	F	3DR S 3RR Sp S,F	log structures (0.8 mi.)	1.5	Slight improvement.	Veg. response from log structures.	F	F
Boulder Creek (N.F.)	573-465	G	Mngmt in asstn w/ pr. land		2.1	No Change	Lack of further veg. response.	G	G
(S.F.)	600-595	P	2DR S/F 1D Sp,S F	fencing	0.8	Improve to good.	Fencing	G	G
	520	F	3DR S/ 1DR F		1.2	No Change	Lack of further veg. response.	F	F
	618	F	Mngmt in asstn w/ pr. land		1.7	Slight improvement.	Veg. response from biological use limit.	F	F
(Main)	526	P	2DR Sp		1.8	No Change	Inaccessible to cattle but sheep present.	P	F
	526-603	P	1DR Sp & 2DR Sp		2.4	No Change	Inaccessible to cattle but sheep present.	P	F
	595-503	P	1D Sp,S, F/2DR S, F	fencing	0.3	Improve to good.	Fencing	G	G
	526-503	F	1DR Sp & 2DR Sp	log structures	1.5	Slight improvement.	Veg. response from log structures.	F	F
	595-503	G	1D Sp,S, F/2DR S,F		1.3	No Change	Inaccessable to livestock.	G	G
South Mountain Cr. (lower)	600	P	1D Sp,S, F	fencing	2.5	Improve to fair.	Fencing & hydrological condition.	F	G
Combination Creek	595	P	1DR F	*log structure (2.3 mi)	4.2	Slight improvement.	Veg. response from log structures.	P	F
	595	G	1D Sp,S, F		0.5	No Change	Inaccessible to livestock.	G	G
Rock Creek	613, 602-601	P	2DR Sp/F	*log structure	1.3	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	G
	575	P	Mngmt in asst w/ pr. land		1.3	Slight improvement.	Veg. response from biological use limit.	P	F
	573	P	2DR S/F	log structures	3.0	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	F
	587	F	4RR Season long		0.8	Slight improvement.	Veg response from proposed system & season-of-use.	F	High F
	575	F	Mngmt in asst w/ pr. land		0.4	Slight improvement.	Veg. response from biological use limit.	F	F
	613, 602	G	Mngmt in asst w/ pr. land		1.3	No Change	Lack of further veg. response.	G	G
Louse Creek	601	P	2DR Sp/F	*log structure (1.0 mi)	1.3	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	F
	601	F	2DR Sp/F	*log structure	2.0	Slight improvement.	Same as above.	F	F
Josephine Creek (upper)	502	P	2DR Sp,S F	*log structure (1.5 mi)	2.7	Slight improvement.	Veg. response from log structures.	P	F

Appendix Table K-9 cont.

Stream	Allot.	Present Fisheries Habitat Condition	Proposed Action: Grazing System & Season-of-use	Proposed Action: Other	Stream Miles	10-Year Impact	Major Factors Contributing to 10-year impact	Predicted Resultant Fisheries Hab. Con.: 10-Year	Predicted Resultant Fisheries Hab. Con.: 20-Year
Josephine Cr. (cont)									
(lower)	587	P	4RR Sp,S F	*log structure (2.3 mi)	2.6	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	G
	575	P	Mngmt in asst w/ pr. land	*log structure	1.0	Improve to fair.	Same as above.	F	F
Rose Creek									
(upper)	587	P	4RR Sp,S F	*log structure (0.8 mi)	1.3	Improve to fair.	Same as above.	F	G
(lower)	573	P	2DR S/F 4RR Sp,S F	log structures	0.5	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	Low G
	573	F	2DR S/F		1.3	No Change	Lack of further veg. response from proposed system & season-of-use.	F	Low G
	575	F	Mngmt in asst w/ pr. land		0.3	Slight improvement.	Veg. response from biological use limit.	F	F
Meadow Creek	589	P	2DR S/F	log structures (0.8 mi)	2.8	Improve to fair.	Veg. response from proposed system & season-of-use & log structures.	F	F
	533, 504	P	3DR S/F	log structures (2.5 mi)	3.4	Improve to fair.	Same as above.	F	High F
Noon Creek									
(upper)	520	P	Less int mngmt.	fencing	1.7	Improve to fair.	Fencing and hydrology.	F	G
	501	P	2DR S/F	*log structure	2.0	Slight improvement.	Veg. response from log structures.	P	F
	501	F	2DR S/F		1.8	No Change	Lack of further veg. response from proposed system & season-of-use.	F	F
(lower)	501	G	2DR S/F		2.7	No Change	Inaccessible to grazing.	G	G
Corral Creek									
(upper)	561	P	Less int mngmt.	fencing	5.6	Improve to good.	fencing	G	G
(lower)	501	P	2DR S/F	*log structure	0.8	Slight improvement.	Veg. response from log structures.	P	F
	501	F	2DR S/F		0.8	No Change	Lack of further veg. response from proposed system & season-of-use.	F	F
Cabin Creek									
(upper)	561	F	Less int mngmt.		3.0	Slight improvement.	Veg. response from biological use limit.	F	F
(lower)	501	P	2DR S/F	*log structure (1.5 mi)	4.9	Slight improvement.	Veg. response from log structures.	P	F
	501	F	2DR S/F		1.2	No Change	Lack of further veg. response from proposed system & season-of-use.	F	F
Juniper Creek									
(upper)	561	P	Less int mngmt.	fencing	0.5	Improve to good.	fencing	G	G
(lower)	501	P	2DR S/F	*log structure	1.8	Slight improvement.	Veg. response from log structures.	P	F
	501	F	2DR S/F	*log structure (0.5 mi)	1.6	Slight improvement.	Same as above.	F	F
	501	G	2DR S/F		0.8	No Change	Inaccessible to livestock.	G	G
Pleasant Valley Cr.	546	P	2RR Sp		2.0	No Change	Lack of veg. response from proposed system & season-of-use.	P	P
	546	F	2RR Sp		3.9	No Change	Same as above.	F	F
Squaw Creek	539	P	2DR S/F		1.2	Improve to fair.	Veg response from proposed system & season-of-use.	F	F
	539	F	2DR S/F		5.4	No Change	Lack of further veg. response from proposed system & season-of-use.	F	F
	539	G	2DR S/F		0.8	No Change	Inaccessible to livestock.	G	G

Appendix Table K-9 cont.

Stream	Allot.	Present Fisheries Habitat Condition	Proposed Action: Grazing System & Season-of-use	Proposed Action: Other	Stream Miles	10-Year Impact	Major Factors Contributing to 10-year impact	Predicted Resultant Fisheries Hab. Con. 10-Year	Predicted Resultant Fisheries Hab. Con. 20-Year
N.F. Owyhee River (upper)	520, 548-501	P	Less int mngmt 3RR Sp,S F/2DR S/F	fencing	5.5	Improve to fair.	Fencing and hydrology.	F	G
	520	F	Less int mngmt.		1.2	Slight improvement.	Veg. response from biological use limit.	F	F
	548-501	F	2DR S/F 3RR Sp,S F		1.3	No Change	Lack of further veg. response from proposed system & season-of-use.	F	F
	501-546	F	2DR S/F 2RR Sp	fencing	2.0	Improve to good.	fencing	G	G
	501-546	F	2DR S/F 2RR Sp		2.6	No Change	Lack of further veg. response from proposed system & season-of-use.	F	F
	539-501	F	2DR S/F		1.2	No Change	Same as above.	F	F
(lower)	500	P	3RR Sp	fencing	1.5	Improve to good.	fencing	G	G
	500	F	3RR Sp		1.3	No Change	Lack of further veg. response from proposed system & season-of-use.	F	F
	539-542	F	1DR Sp/F 2DR S/F	fencing	1.0	Improve to good.	fencing	G	G
	542-539	F	1DR Sp/F 2DR S/F	log structures	1.7	Slight improvement.	Veg. response from log structures.	F	F
	501-539	G	2DR S/F		0.5	No Change	Inaccessible to livestock.	G	G
M.F. Owyhee River	539-540	P	2DR S/F 3RR Sp	fencing	2.0	Improve to good.	fencing	G	G
	539	F	2DR S/F	fencing	4.0	Improve to good.	fencing	G	G
	539	F	2DR S/F		0.5	No Change	Lack of further veg. response from proposed system & season-of-use.	F	G
Current Creek	520, 599-548	P	Less int mngmt & 3RR Sp,S F	fencing	8.0	Improve to good.	fencing	G	G
	548-599	F	3RR Sp,S F		2.0	No Change	Lack of further veg. response.	F	F
	599-548	G	3RR Sp,S F		1.3	No Change	Inaccessible to livestock.	G	G
Nickel Creek	548	P	3RR Sp,S F		3.2	Improve to fair.	Veg response from proposed system & season-of-use.	F	G
	548-550	F	3RR Sp,S F		4.2	No Change	Lack of further veg. response from proposed system & season-of-use.	F	High F
Deep Creek (upper)	459,599	P	Mngmt in asst w/ pr. land		1.5	Slight improvement.	Veg. response from biological use limit.	P	F
	599,548,560, 549	P	3RR Sp,S F	fencing	6.0	Improve to good.	fencing	G	G
	599, 548	P	3RR Sp,S F		12.0	Improve to fair.	Veg response from proposed system & season-of-use.	F	F
(lower)	551	F	1RR Sp/S		16.4	No Change	Use of bighorn sheep in area & catttle will continue as present.	F	F
	549	F	2DR Sp		0.9	No Change	Lack of further veg. response from proposed system & season-of-use.	F	F
Red Canyon Creek	539,540,593	P	3RR Sp/ 2DR S,F/ 1D S	fencing	17.3	Improve to good.	fencing	G	G
	540-539	F	3RR Sp	Fencing off access upstream.	1.8	Improve to good.	Upstream fencing off access.	G	G
	593-539	G	3RR Sp/ 1D S		0.8	No Change	Inaccessible to livestock.	G	G
E.F. Owyhee River	551-584, 500	F	1RR Sp/ 2RR S,F/ 2DR Sp	Fencing off access.	4.0	Improve to good.	Upstream fencing.	G	G
	551-584,589, 593,540,501	F	1RR Sp/ 2DR S,F/ 1D S		18.3	No Change	Fairly inaccessible to livestock.	F	F
	593-539	G	3RR Sp/ 1D S/2DR Sp		7.5	No Change	Inaccessible to livestock.	G	G
	551,584,539, 593	F,G	Out of ES area		24.3	No Change	No significant upstream impacts.	F,G	F,G
Wilson Creek	508	P	2DR Sp		10.4	Slight improvement.	hydrology	P	F
Rabbit Creek	517	P	3RR Sp		13.1	No Change	hydrology	P	P

* indicates areas considered for fencing in alternative 3 in addition to those areas shown in the table.

APPENDIX L
Economic Data Methodology

Ranch Budget Collection and Development

It was decided to collect the necessary ranch budgets through a contract with Abt Associates of Englewood, Colorado. Their final report, dated July 24, 1979, (Abt Associates 1979) included budgetary information gained from interviewing six ranchers, two in each group. It was felt that this did not constitute a sufficient sample. Since the office of Management and Budget (in the President's executive office) regulations do not allow interviewing more than nine persons when asking the same questions without an OMB approved questionnaire, it was decided to collect three additional interviews. It was decided to not attempt to have our ranch budget report approved by OMB since it is a lengthy process with unknown results while the Owyhee EIS is under court order to be completed by the fall of 1980. The same ranch budget report was used by Abt Associates and the BLM in collecting the nine budgets (three from each group). The economics and sociology staff in the Idaho State Ofice, BLM, collected the three additional budgets. These were then averaged with the budgets collected by Abt Associates in order to develop our initial budgets. These budgets were then sent to the Department of Agricultural Economics and Applied Statistics, University of Idaho for comment. They were also sent to the Owyhee County Extension Agent for his review and comment.

Linear Programming

Linear programming is a technique which optimizes an objective function by allocating constrained resources to various activities. The linear programming (L.P.) models used in this analysis maximize short run income to the ranchers by allocating various sources of cattle feed (i.e., BLM forage, state forage, hay, private pasture, etc.) to livestock production. The basic data input to these models is from the ranch budgets developed through the process described above.

This report is limited to a discussion of the L.P. model for size group two (150-399 head) ranches. The techniques are the same for the other size groups.

Cattle feed sources in model were based on AUMs rather than on tons of feed or acres of productive land. Table L-1 illustrates the feed sources for the group two cattle ranch.

Livestock production was based on "Basic Animal Units" (Lewis and Taylor, 1977). They consist of set proportions of cows, bulls, replacement heifers, steers, and calves. Each basic animal unit contributes to the production of livestock for final sales. The parameters used in determining the composition and production of the basic animal unit are presented in Table L-2.

Impact analysis was based on changing the amount of EIS area BLM forage constraints. No changes in the productivity of private lands were included. For other applications of linear programming to livestock ranching refer to Lewis, Eugene P. and David T. Taylor, Impact of Public Lands Policies on the Livestock Industry and Adjacent Communities, Bighorn County, Wyoming, University of Wyoming, Laramie (1977); Ching, Christenson and Ulrich, A Linear Programming Model of Nevada Ranch Enterprises, Reno, University of Nevada (1977); and Bartlett, E.T., R.G. Taylor, and J.R. McKeon, Impacts of Federal Grazing on the Economy of Colorado, Fort Collins, Colorado State University (1979).

TABLE L-1
Feed Sources
Size Group 2

Resource	Amount (AUMs)	Period of Use[2/]
Hay	628	All
Aftermath	500	4
BLM Permit	619	2
Grazing Assoc.	217	2, 3
Grazing Assoc. (BLM)[1/]	576	2, 3
Private Range	178	3

1/ That portion of Grazing Association permit which is obtained from BLM permits issued to the Grazing Association.

2/ Period 1 - January through March
2 - April through Mid-September
3 - Mid-September through October
4 - November through December

TABLE L-2
Production Statement
Group 2

Each Animal Unit

Produces:	104.58 lbs. of cow sales
	495.82 lbs. of Calf + yearling sales
	600.40 lbs. of production sold
Requires:	4.10 AUMs in Period 1
	8.07 AUMs in Period 2
	2.32 AUMs in Period 3
	3.20 AUMs in Period 4

Range Improvements

The regional construction industry would experience some direct benefits from the installation and maintenance of range improvements and land treatments.

In order to determine the magnitude of these impacts several steps were required. First, it had to be determined how much of past materials purchased in the Boise District were made in the study area. After examining the district's purchasing records, it was found that few purchases were made in Canyon, Owyhee, or Malheur counties. From this analysis, it was decided that the regional economy would not benefit from materials purchases required for range improvements. Labor needs would be purchased in the trade area. To determine just how much, the Chief of Operations in the Boise district was contacted to determine the amount of labor which would be purchased in the region. From the discussion, it was discovered that approximately 25 percent of labor purchases are made locally. The next step necessary was to determine how much of each range improvement and/or land treatment costs are the labor charge. This information was provided by the Owyhee Resource Area staff. Table L-3 shows the labor requirements for range improvements and land treatment construction. It was assumed that 25 percent of all maintenance costs would be incurred within the region.

TABLE L-3
Range Improvements and Land Treatments
Labor Requirements
(Construction)

Improvement/Treatment	Total Cost/Unit	Labor Cost/Unit	% Labor of Total
Pasture Fence	$2,300/mile	$1,120	49
Exclosure Fence	$2,900/mile	$1,600	55
Pipeline	$4,500/mile	$ 540	12
Spring	$1,600/each	$ 336	21
Reservoir	$7,800/each	$7,300	94
Juniper Chaining	$ 120/acre	$ 120	100
Other Brush Control	$ 6/acre	$ 4	67
Brush Control & Seeding	$ 18/acre	$ 4	22

Dynamic Regional Analysis Model

Direct impacts (such as changes to ranch income and changes in the construction industry) cause other impacts to occur. For instance, when ranchers have less income, they purchase fewer goods and services in town, thus lowering the merchant's income. This is called the secondary impact. In order to analyze these impacts, a computer model is used, which estimates these impacts. It is called the Dynamic Regional Analysis Model (DYRAM). The direct income impacts are inputted and the model calculates direct employment and secondary income and employment impacts. The model uses industry earnings in combination with a 20 sector industry expected transaction matrix compiled from the national input-output table in order to estimate net exports or imports by industry for the economy of a given area. Multipliers are computed; they refer to impacts on personal income, not business income. Multipliers are the ratio between the ultimate increase of income arising from an increment of investment and the initial new investment itself. For example, an initial income increase in the livestock industry creates additional (or secondary) increases in both the livestock and other sectors of the economy). A multiplier estimates what this addition would be. With initial income increased by $1,000 and a multiplier of 1.5, the total income increase would be $1,500, with $500 being the additional increase estimated by the multiplier. The detailed mathematical explanation of DYRAM may be found in the Annals of Regional Science, November 1975, pp. 44-50.

Discounting

Since each alternative represents differing mixes of livestock use and construction activities, it was decided to determine the net present worth for each alternative. Present worth is the amount of money today which will become a given amount at a stated time in the future. For example, at 10 percent interest \$100 will grow to \$110 in one years; therefore, the present worth of \$110 one year from now at 10 percent interest is \$100. If the end product is a series of payments, the present worth is the amount that will result in the sum of the series. The nest present worth of each alternative then, is the sum of the present worths of the income streams associated with livestock, construction, etc. Discounting is the procedure whereby the present worth of future income is determined. The concept is the converse of growth in value due to accrued interest. The proposed action and the five alternatives have been discounted to reflect their present worth with an assumed interest rate of 7.125 percent (established by the Water Resources Council for use by federal agencies in 1980. Table L-4 shows the discounting procedure for the loss of direct rancher income in the proposed action.

Table L-4
Discounting Procedures
Proposed Action - Rancher Income

Time Frame (years)	Equations[1/]	Assumptions
1 - 10	$PW = \text{Annual Change } (1-(1+i)^{-n}/i)$ $= -\$367,000\ (6.98318)$ $= -\$2,562,827$	$n = 10$ $i = .07125$
11 - 15	$PW = \text{Annual Change } (1-(1+i)^{-n}/i)(1/(1+i)^{n})$ $= -\$290,000\ (4.08651)(.50245)$ $= -\$595,447$	$n = 10$ $-n = 5$ $i = .07125$
16 - 20	$PW = \text{Annual Change } (1-(1+i)^{-n}/i)(1/(1+i)^{n})$ $= -\$128,000\ (4.08651)(.35615)$ $= -\$186,293$	$n = 15$ $-n = 15$ $i = .07125$

1/ From Nelson, Lee, and Murray, (Agricultural Finance, Iowa State, Sixth Edition, 1973.

Economics, Statistics and Cooperative Service Budgets

The budgets which follow were prepared by the Economics, Statistics, and Cooperative Service (ESCS) of the U.S. Department of Agriculture. They are prepared from information provided by the BLM, the University of idaho, and their own data. These are draft budgets and have not received rancher input for the verification of their accuracy.

Appendix Table L-5
Owyhee EIS Area (Idaho) Beef Cow Budget
0-149 Head, 1978 (Draft)

Sales	Head	Avg. Weight (pounds)	Price/cwt	Total Dollar Value
Steers	43	690	46.88	13,909.29
Heifers	24	615	42.48	6,270.04
Cull Cows	16	1,000	22.00	3,520.00
Total				23,699.34
Total/cow				225.71

Cash Costs:	Total Dollar Value	Dollar Value/Cow
BLM permit	1,275.00	12.14
Hay (produced)	4,479.78	42.66
Salt and minerals	80.80	.77
Veterinary and medicine	820.00	7.81
Trucking	452.00	4.30
Marketing	370.00	3.52
Grazing association	1,560.32	13.86
Other feed	4,420.00	42.10
Fuel and lub.	955.87	9.10
Repairs	907.83	8.65
Equipment and labor	47.52	.45
Interest on operating capital	1,481.58	14.11
Land tax	1,101.26	10.49
General farm overhead	1,331.00	12.68
Insurance	533.74	5.08
Other taxes	252.63	2.41
Total	20,069.33	191.14

Other costs:		
Value of family labor	7,030.00	66.95
Depreciation	3,378.06	32.17
Interest on investment other than land	5,308.82	50.56
Interest on land investment	13,587.99	129.41
Management charge	2,427.94	23.12
Total	31,732.81	302.22
Total all costs	51,802.14	493.35

Return above cash costs	3,630.01	34.57
Return above cash costs and family labor	-3,399.99	-32.38
Return to total investment and management	-6,778.05	-64.55

Owyhee EIS Area (Idaho) Beef Cow Budget
150-399 Head, 1978 (Draft)

Sales	Head	Avg. Weight (pounds)	Price/cwt	Total Dollar Value
Steer calves	42	500	52.45	11,014.50
Heifer calves	29	500	44.91	6,511.95
Feeder steers	43	780	45.56	15,280.82
Feeder heifers	30	660	42.48	8,411.04
Cull Cows	16	1,000	22.00	3,520.00
Total				44,738.30
Total/cow				225.95

Cash Costs:	Total Dollar Value	Dollar Value/Cow
BLM permit	1,675.50	8.66
Hay (produced)	8,421.75	42.53
Salt and minerals	161.60	.82
Veterinary and medicine	1,234.00	6.23
Trucking	449.00	2.27
Marketing	403.00	2.04
Grazing association	5,089.50	25.70
Other feed	7,541.00	38.00
Fuel and lub.	1,211.33	6.12
Repairs	1,192.22	6.02
Hired labor	83.58	.42
Interest on operating capital	2,313.92	11.69
General farm overhead	1,657.00	8.37
Land tax	1,690.22	8.54
Other taxes	344.43	1.74
Insurance	880.64	4.45
Total	34,348.69	173.48

Other costs:		
Family labor	9,279.60	46.87
Depreciation	3,718.32	18.78
Management charge	3,894.96	19.67
Interest on investment other than land	8,995.07	45.43
Total	25,887.95	130.75
Total all costs but land	60,236.64	304.23

Return above cash costs	10,389.61	52.47
Return above cash costs and value of family labor	1,110.01	5.61
Return to total capital and management	-2,608.31	-13.17

Owyhee EIS Area (Idaho) Beef Cow Budget
400 Head, 1978 (Draft)

Sales	Head	Avg. Weight (pounds)	Price/cwt	Total Dollar Value
Steers	192	800	45.56	69,980.12
Heifers	125	710	42.48	37,700.97
Cull Cows	59	1,175	22.00	15,251.50
Total				122,932.56
Total/cow				274.40

Cash Costs:	Total Dollar Value	Dollar Value/Cow
BLM permit	2,197.50	4.91
Hay (produced)	19,118.85	42.68
Salt and minerals	541.36	1.21
Veterinary and medicine	2,785.00	6.22
Trucking	167.00	.37
Marketing	675.00	1.51
Pasture rent/lease	8,333.00	18.60
Grazing association	5,336.50	11.91
Other feed	18,446.00	41.17
State land	1,986.74	4.43
Fuel and lub.	2,858.83	6.38
Repairs	2,710.64	1.74
Equipment labor	186.36	.42
Interest on operating capital	5,182.53	11.57
Land tax	3,191.91	7.12
General farm overhead	2,999.00	6.69
Insurance	1,980.57	4.42
Other taxes	738.01	1.65
Total	79,434.80	177.31

Other costs:		
Value of family labor	18,559.20	41.43
Depreciation	10,391.16	23.19
Interest on investment other than land	20,307.67	45.33
Management charge	8,785.03	19.61
Total	51,090.46	114.04
Total all costs	136,781.25	305.32

Return above cash costs	43,497.76	97.07
Return above cash costs and family labor	24,938.56	55.67
Return to total investment and management	14,547.40	32.47

GLOSSARY

Active Grazing Preference: That portion of the total grazing preference that could be licensed and used should the livestock operator desire.

Active Use: Grazing privileges which have been paid for and are presently being used, also called actual use.

Activity Occasion: Participation by one person in one activity for all or part of one day.

Allotment Management Plan (AMP): A documented program which applies to livestock operators on the public lands, which is prepared in consultation with the permittee(s) or lessee(s) involved, and which: (1) prescribes the manner in and extent to which livestock operations will be conducted in order to meet the multiple-use, sustained-yield, economic, and other needs and objectives as determined for the public lands through land use planning; and (2) describes the type, location, ownership, and general specifications for the range improvements to be installed and maintained on the public lands to meet the livestock grazing and other objectives of land management; and (3) contains such other provisions relating to livestock grazing and other objectives as may be prescribed by the authorized officer consistent with applicable law.

Animal Unit Month (AUM): The amount of forage required by one mature cow (1,000 pounds) or the equivalent for one month.

Biological Limit Use Level: The level or degree of grazing that can be allowed without periodic rest treatments and still satisfy plant growth requirements. The levels vary with vegetation and season-of-use but are normally between 30 and 50 percent.

Canopy Cover: The uppermost layer consisting of crowns of trees or shrubs which protect the ground.

Competitive AUM: The cattle AUM equivalent of competitive forage requirements for other grazing hoofed animals.

Consumer Price Index: A statistical measure of changes in prices of good and services.

Contrast Rating System: A method of determining the extent of visual impact of a proposed activity. It measures the combined alteration of line, form, color and texture, from the existing landform, vegetation and structures.

Cultural Resources: Cultural resources include the fragile and nonrenewable remains of human behavior as reflected in sites and the components of sites, such as structures, objects and natural features that were utilized in human events. These are further defined as areas where significant human events occurred, even though evidence of the event no longer remains, and as the environment surrounding the actual resource. Cultural resources are commonly discussed in terms of their prehistoric and historic values.

Discounting: The procedure whereby the present worth of future income is determined. The concept is the converse of growth in value due to accrued interest.

Distance Zones: Areas that can be seen, e.g. foreground - middleground (0-5 miles), background (5-15 miles) and seldom-seen areas.

Dynamic Regional Analysis Model: DYRAM - The model used in determining secondary impacts. It uses industry earnings in combination with a 20 sector industry-expected transition matrix, compiled from the national input-output table, in order to estimate net exports or imports by industry for the economy of a given area. Multipliers for each industry are computed; they refer to impacts on personal income, not business income. The detailed mathematical explanation of the model may be found on file at the Boise District Office or in the Annals of Regional Science, November 1975, pp. 44-50.

Ecological Condition: The present state of vegetation on an ecological site in relation to the climax (natural potential) plant community for that site.

Fenced Federal Range: Public land fenced out with private land. See Management in Association with Private Lands.

Field Capacity (field moisture capacity): The amount of water remaining in a soil after the free water has drained away for a day or two if the root zone has been previously saturated. It is the greatest amount of water that the soil will hold under conditions of free drainage, usually expressed as a percentage of the oven-dry weight of soil or other convenient unit.

Forage: All browse and berbaceous foods that are available to grazing animals.

Ground Cover: The area of ground covered by living plants or dead parts of plants.

Infiltration Rate: The maximum rate at which the soil, under various specified conditions, can absorb falling rain or melting snow.

Intensive Management: The incorporation of specific grazing systems, levels of grazing use, season-of-use and range improvement projects into the management of public lands containing high resource values.

Interest: The price paid for the use of money or capital. Interest compensates the supplier of money or capital for uncertainty, for alternative uses of his capital, and for the loss of purchasing power due to inflation. Interest represents the time value of money.

Less Intensive Management: The development of grazing systems to improve the land to a good ecological site condition. This would apply to very small allotments or to those allotments containing large percentages of state or private lands.

Licensed Use: The maximum amount of livestock grazing authorized by BLM on a designated area for a period of time.

Management Framework Plan (MFP): A planning decision document which establishes for a given area, land use allocations, coordination guidelines for multiple use and management objectives to be achieved for each class of land use or protection. It is BLM's land use plan.

Management in Association with Private Lands: The application of range management to grazing allotments containing mostly private land and small acreages of fenced BLM land. Grazing use would be permitted only at biological use limit levels during any time of year, provided resource conditions were stable or improving.

Multiplier: The ratio between the ultimate increase of income arising from an increment of investment and the initial new investment itself. For example, an initial income increase in the livestock industry creates additional increases in both the livestock and other industries from added feed, seed, clothing, etc., purchases. A multiplier estimates what this addition would be. With initial income increased by $1,000 and a multiplier of 1.5 the total income increase would be $1,500 with $500 being the additional increase estimated by the multiplier.

Present Worth: An amount of money today which will become a given amount at a stated time in the future. For example, at ten percent interest $100 will grow to $110 one year; therefore, the present worth of $100 one year from now at ten percent interest is $100. If the end product is a series of payments, the present value is the amount that will result in the sum of that series.

Range Readiness: The stage of growth of the important palatable plants on the range and the condition of the soil which permit grazing without causing excessive soil compaction or endangering the ability of the plants to maintain themselves.

Rill Erosion: The removal of soil by running water, creating numerous shallow channels, less than six inches deep.

Sheet Erosion: The removal of a fairly uniform layer of soil from the land surface by runoff water or wind.

Standard Industrial Classification: A four digit code developed for use in the classification of establishments as kind-of-activity units by type of economic activity in which engaged.

Trade Area: The geographic area in which people make a majority of their purchases for goods and services.

Unit Resource Analysis (URA): A basic source of information on a specific area and its resources potential and capability of the land to fill the public's needs for various resource activities including recreation, wildlife, watershed and range management.

Universal Soil Loss Equation: An equation used for the design of water erosion control systems: A = RKLSPC wherein A = average annual soil loss in tons per acre per year; R = rainfall factor; K = soil erodibility factor; L = length of slope; S = percent of slope; P = conservation practice factor; and C = cropping and management factor (T = soil loss tolerance value that has been assigned each soil, expressed T/A/Year).

Vegetation: Plants in general, or the sum total of the plant life in the area.

Viewer Sensitivity: Indicates the degree of user interest in visual resources, and changes in the existing landscape character. This is based on travel volumes and level of public concern.

Water Resistant Layer: A wax-like layer that forms on soil particles following extremely hot, long lasting fires which impedes water infiltration.

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LIST OF PREPARERS

This list summarizes the qualifications and responsibilities of persons primarily accountable for the Owyhee EIS.

Oscar E. Anderson, Owyhee Resource Area Manager, was responsible for the MFP recommendations from which the proposed action evolved. He has a B.S. in range management from the University of Idaho. He began his career with the Bureau of Land Management as a soil and watershed specialist in Dillon, Montana, later becoming assistant area manager. Then he worked as a soil and watershed specialist in Elko, Nevada before promotion to Wells Resource Area Manager. He has been BLM's Owyhee Resource Area Manager since 1976.

D. Scott Brayton, has been Writer/Editor for the Bureau of Land Management since 1979. He has a degree in natural resources communications from Humboldt State University. Brayton has eleven years experience in public affairs and communications with the Washington State Department of Natural Resources, National Park Service and private industry.

Paul S. Card, wrote the sections on social conditions. He has degrees in math and sociology from Eastern Washington State College and attended graduate school at the University of Idaho. Card worked five years with the Idaho Transportation department supervising the production of many environmental documents. After two years working in the Executive Office of the governor of Idaho, he joined the BLM as a sociologist in 1979.

Dana C. Danzer, wrote the narrative for the watershed portion of the EIS. Danzer has a B.S. in fish and wildlife management from Montana State University. He has worked as a range conservationist for BLM's Boise District for three years.

Mark H. Davis, provided the expertise on the visual resources sections of the EIS. He has a B.A. in landscape architecture from Penn State University and a M.A. in landscape architecture from the University of Massachusetts. Davis has worked in planning and design with the firm of Beckman, Yoder and Seay, the Bureau of Reclamation and the Soil Conservation Service. He was an environmental reviewer for the Economic Development Administration and served on two presidential committees for the Heritage Conservation and Recreation Service before joining BLM in 1979.

Stanley C. Frazier, authored the sections on economics. A graduate of Oregon State University with a B.S. in agricultural economics, he has been an economist at BLM for five years and contributed to six EIS's. Frazier currently works out the BLM State Office in Boise.

Dean Littlepage, wrote the sections on wilderness. Littlepage has degrees in political science from the University of Texas and recreation and resource management from Stanford University. He has worked for the U.S. Forest Service, Bureau of Land Management and public school districts in various jobs including backcountry management, recreation planning, forestry, outdoor education and cultural resource survey.

Sam Mattise, coordinated writing of the wildlife sections in the EIS. He received a B.S. in wildlife biology from Panhandle State University and a M.S. in wildlife biology from South Dakota State University. Mattise has utilized his knowledge as a wildlife biologist for the BLM's Boise District since 1978.

Walter H. Meyer, Jr., analyzed the effects of the proposed action and alternatives on recreation opportunities in the Owyhee Resource Area. He is a graduate of Oregon State University with a B.S. in forest management. Meyers has 22 years experience in outdoor recreation planning and management with the National Park Service, U.S. Forest Service, Bureau of Outdoor Recreation and the Bureau of Land Management. He has been the Boise District outdoor recreation planner for nine years.

Ted Milesnick, as team leader for the EIS, also contributed to the development of the Proposed Action and its alternatives. He has a B.S. in range management from Montana State University and has worked for the BLM since 1971. He served BLM as a range conservationist in the Owyhee Resource Area and in Susanville, California before returning to the Boise District in 1979. Milesnick has assisted in the preparation of two prior grazing EIS's.

Mike Rath, wrote portions of the wildlife sections. He has a B.S. in wildlife management from Oregon State University. Rath has been a district wildlife biologist with BLM twelve years; working in Couer d'Alene and now Boise. He has worked on several EIS's.

Rob Roudabush, wrote and developed the soils sections of the EIS. He has a B.S. in soil and water science and a M.S. in range management from the University of California at Davis. Roudabush has worked for the BLM since 1976 as a soils consultant and soil scientist for their Idaho State Office and Boise District. Presently, he is the Boise District soil scientist and soil survey team leader.

Alan Sands, wrote portions of the wildlife narrative. He received a B.A. in geography from San Diego State University and a M.S. in wildlife management from Humboldt State University. Sands then worked as a planner for San Luis Obispo County and as a natural resource planner for the California Coastal Zone Conservation Commission before joining the BLM. He has been a wildlife biologist at the Boise district the past four years.

Ron Senn, developed the vegetation tables and narrative. He obtained his B.S. in forest watershed management and M.S. in range watershed management from the University of Arizona. He has published several articles in technical reports. Senn worked 2 1/2 years with the U.S. Forest Service and has spent the past 2 1/2 years as a range conservationist with the BLM's Boise District in southwest Idaho.

Douglas R. Sipes, wrote and prepared the narrative and tables for the livestock grazing and wild horse management sections of the EIS. He received a B.S. in range/forest management from Colorado State University and a M.S. in range management from the University of

Wyoming. Before joining the BLM in 1978, Sipes worked with the U.S. Forest Service and Mine Reclamation Consultants in Wyoming.

Debby Stefan, researched and wrote the fisheries narrative for the EIS. She received her B.S. in biology from Penn State University and an M.A. in aquatic ecology from the University of Montana. Stefan has worked as a water chemist for private industry, an aquatic biologist for Ichthyological Associates and helped complete an aquatic ecology contract between the University of Montana and the U.S.F.S. Northern Forest Fire Laboratory. She has worked for 3 1/2 years as the fisheries biologist for the Boise District, Bureau of Land Management.

John M. Young, contributed the cultural resources narrative to the EIS. Young has a M.A. in anthropological archaeology from Catholic University. He has taught at Howard University, Prince George's Community College and at Montgomery College. Young has worked as BLM's Resource Inventory Team archaeologist since 1977.

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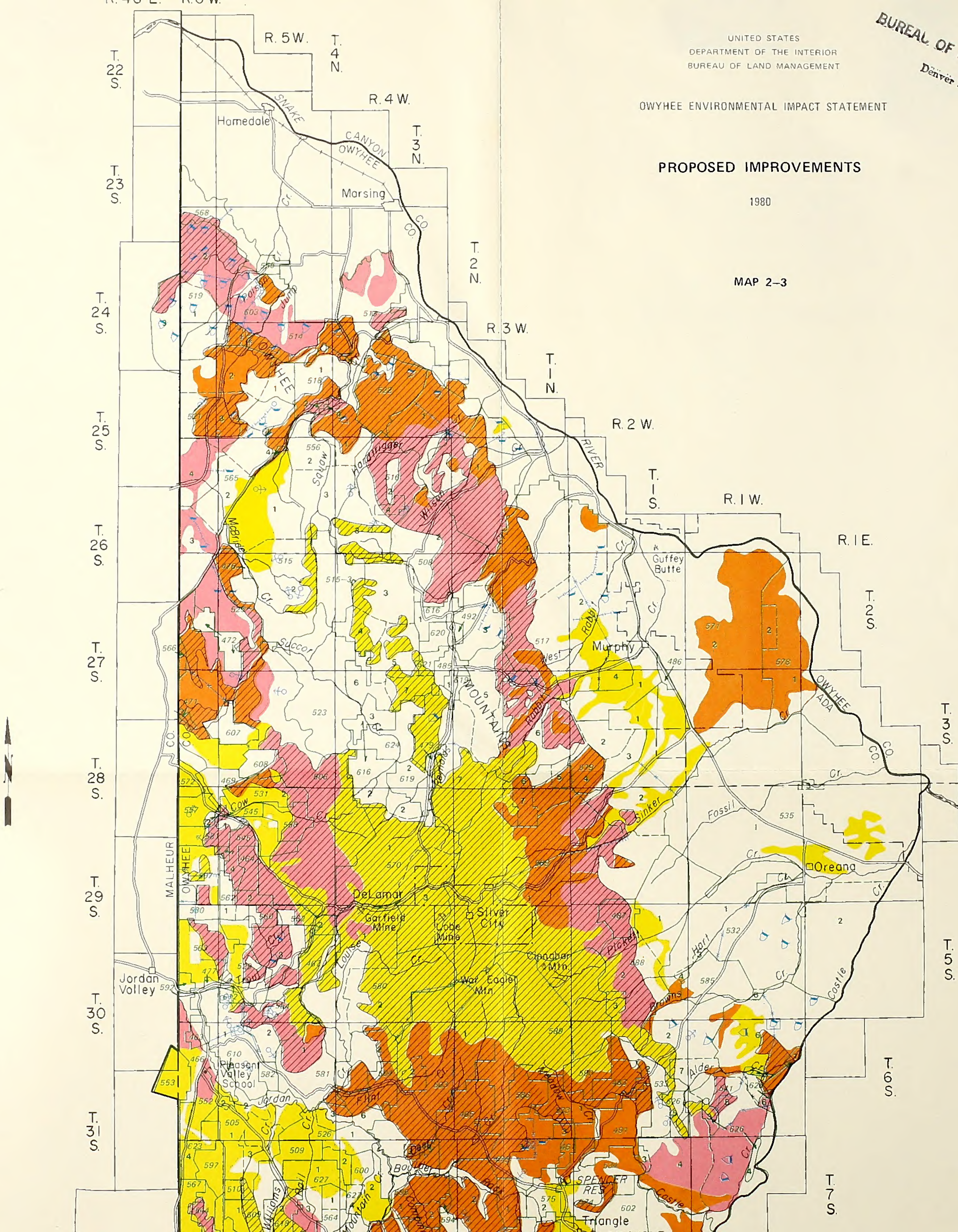
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

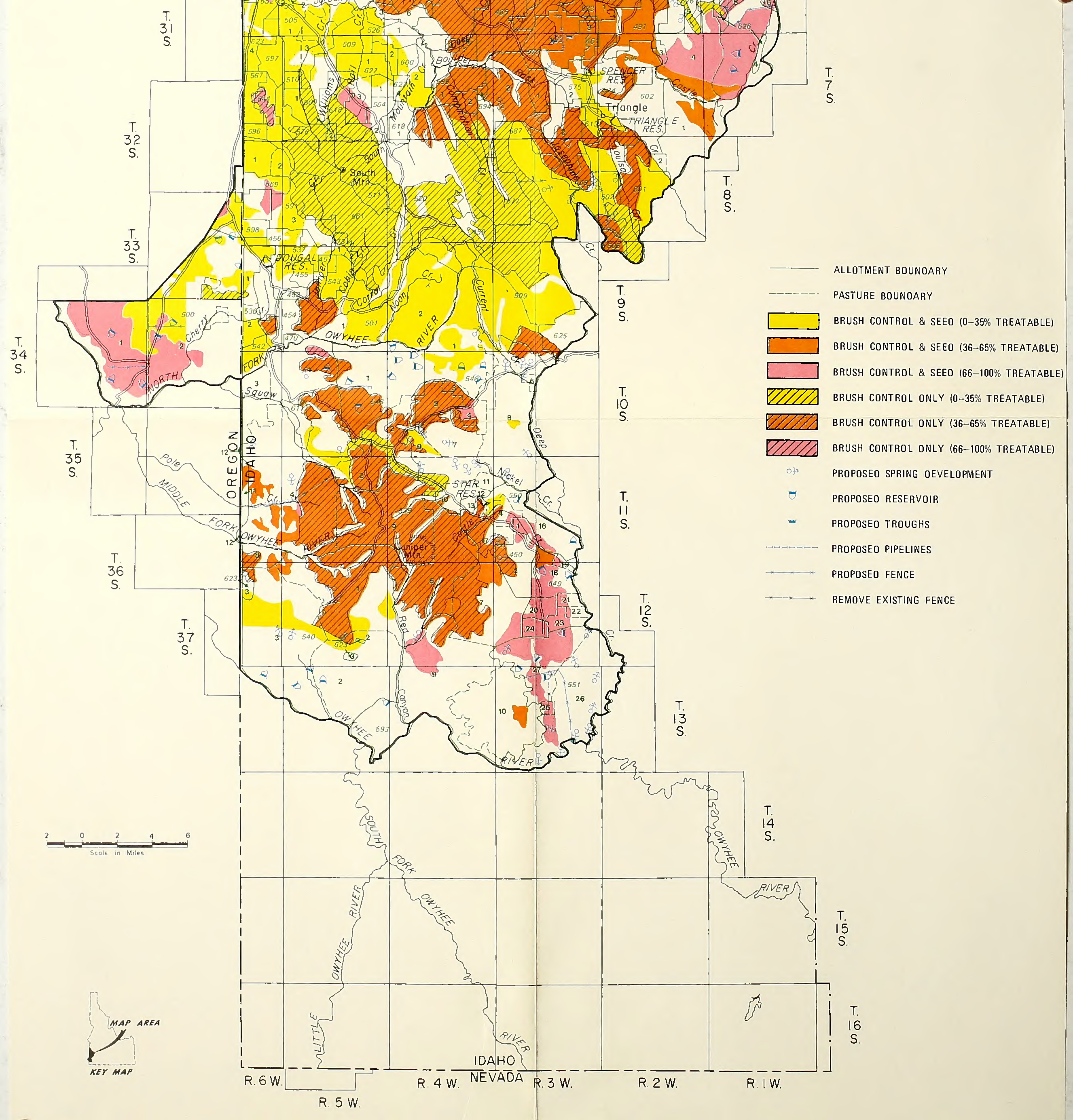
OWYHEE ENVIRONMENTAL IMPACT STATEMENT

PROPOSED IMPROVEMENTS

1980

MAP 2–3




ALLOTMENT BOUNDARY
PASTURE BOUNDARY
BRUSH CONTROL & SEED (0–35% TREATABLE)
BRUSH CONTROL & SEED (36–65% TREATABLE)
BRUSH CONTROL & SEED (66–100% TREATABLE)
BRUSH CONTROL ONLY (0–35% TREATABLE)
BRUSH CONTROL ONLY (36–65% TREATABLE)
BRUSH CONTROL ONLY (66–100% TREATABLE)
PROPOSED SPRING DEVELOPMENT
PROPOSED RESERVOIR
PROPOSED TROUGHS
PROPOSED PIPELINES
PROPOSED FENCE
REMOVE EXISTING FENCE
Scale in Miles
MAP AREA
KEY MAP
OREGON
IDAHO
NEVADA
R. 6 W.
R. 5 W.
R. 4 W.
R. 3 W.
R. 2 W.
R. 1 W.
T. 7 S.
T. 8 S.
T. 9 S.
T. 10 S.
T. 11 S.
T. 12 S.
T. 13 S.
T. 14 S.
T. 15 S.
T. 16 S.
T. 31 S.
T. 32 S.
T. 33 S.
T. 34 S.
T. 35 S.
T. 36 S.
T. 37 S.
SPENCER RES.
Triangle
TRIANGLE RES.
South Mtn.
DOUGAL RES.
STAR RES.
Juniper Mtn.
OWYHEE RIVER
NORTH FORK
MIDDLE FORK OWYHEE RIVER
SOUTH FORK OWYHEE RIVER
LITTLE OWYHEE RIVER

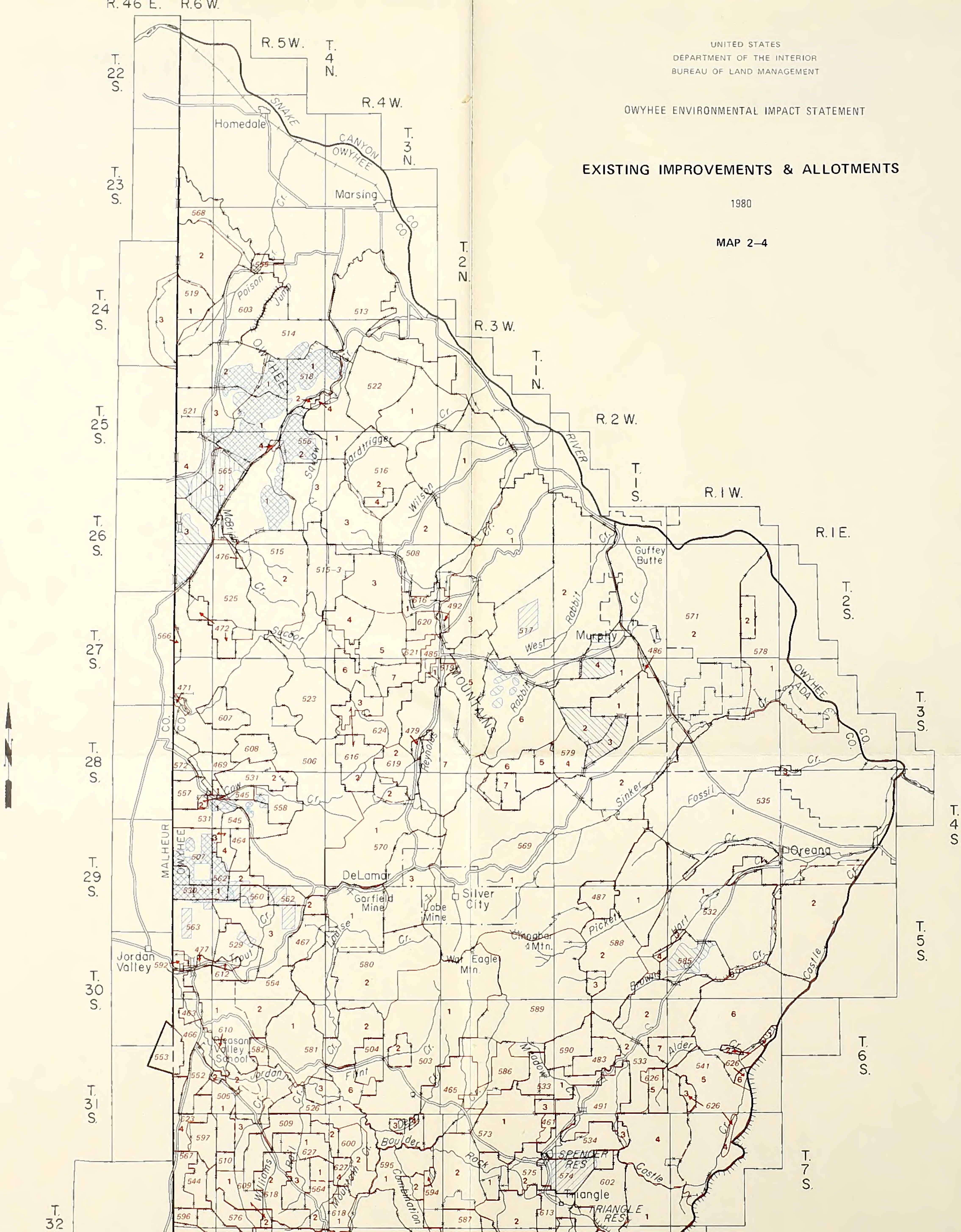
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

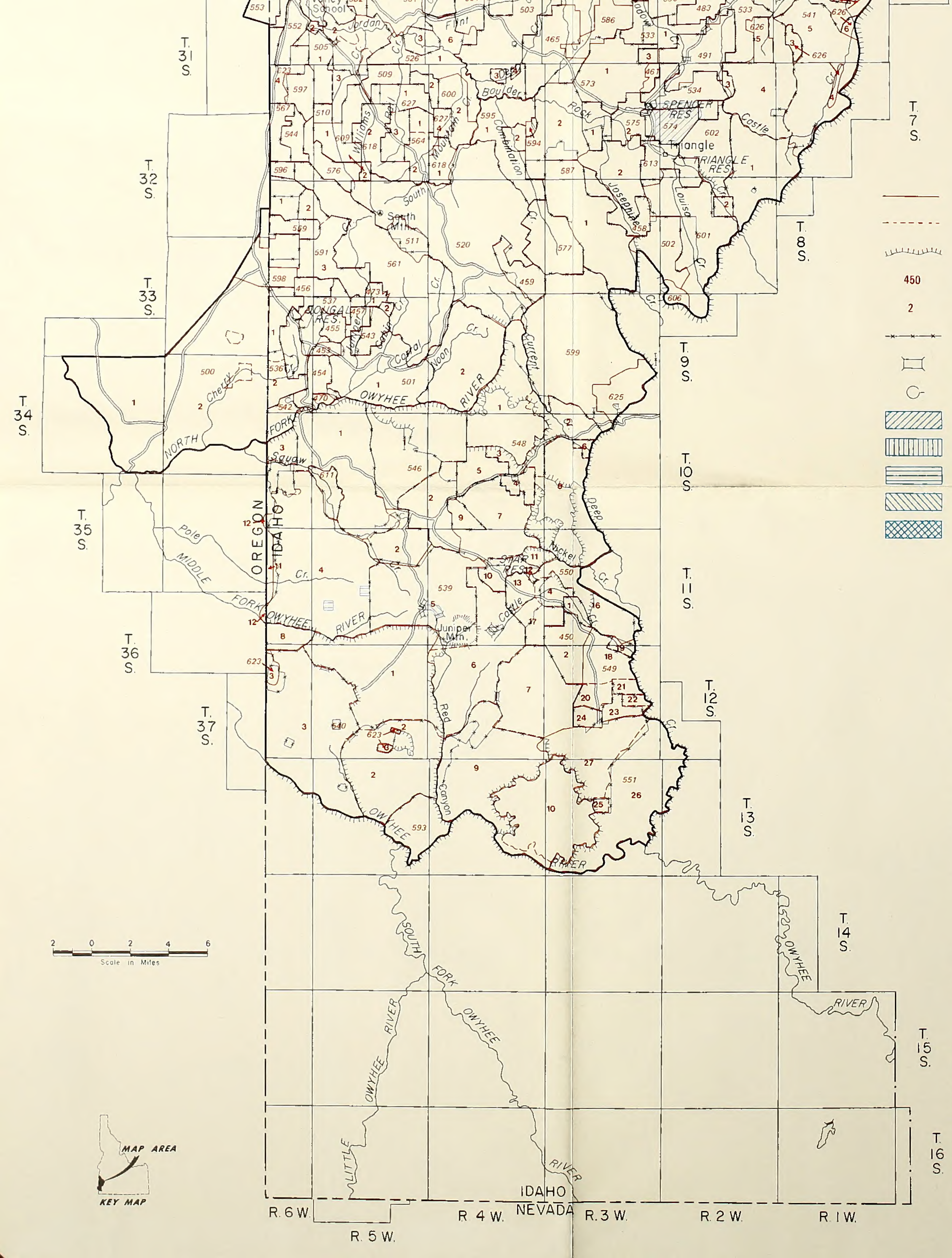
OWYHEE ENVIRONMENTAL IMPACT STATEMENT

EXISTING IMPROVEMENTS & ALLOTMENTS

1980

MAP 2–4





INTENSIVE MANAGEMENT ALLOTMENTS

450	SWISHER SP.	549	BEN MILLS FLAT
500	WHITEHORSE	550	STAR RANCH FIELD
501	CLIFFS	551	SHEEP HILLS
502	LOUISA CREEK	552	GLASS CREEK
503	FLINT CR.-DEER CR.	553	ROBERT GULCH IND.
505	MORGAN IND.	554	GUSMAN IND.
506	McBRIDE-JACKSON	556	SHARPS BASIN
507	PALMER	557	MADARIAGA
508	REYNOLDS	562	COW CR. IND.
509	BOULDER FLAT	563	TROUT CR. IND.
513	ELEPHANT BUTTE	565	ROCKVILLE
514	ALKALI-WILDCAT	568	GRAVEYARD POINT
515	BLACKSTOCK SP.	569	OREANA 2 & 3
516	RIVER GROUP	570	JUMP CR.
517	BLACK MTN.	571	OREANA 1
518	FRENCH JOHN	572	McDANIEL IND.
519	STRODES BASIN	573	HARDIMAN SP.
521	McBRIDE-SANDS	574	WEST ANTELOPE
522	RATS NEST	578	FOSSIL BUTTE
525	JUNIPER SP.	579	OREANA IND.
526	BOULDER FLAT	580	LOUSE CREEK
529	TROUT CR. IND.	581	DUCK CR.-WASH GULCH
530	TROUT CR. IND.	585	BROWNS CR.
531	JOINT ALLOTMENT	587	LONE TREE IND.
532	OREANA 5	588	OREANA IND.
533	NORTH CASTLE	589	BOONE PK.-BATES CR.
534	BOX "T"	590	BRIDGE CR.
535	FOSSIL BUTTE	593	CRUTCHER CROSS
536	SOUTH DOUGAL	595	COMBINATION CR.
539	TROUT SPRINGS	597	WROTEN IND.
540	BULL BASIN	599	BURGHARDT IND.
547	WHITEHORSE-ANTELOPE	600	SOUTH MTN. IND.
542	CHERRY CR. FIELD	601	LOUISA CR.
546	PLEASANT VALLEY	602	W. ANTELOPE
548	BATTLEGROUND BONE	603	POISON CR.

LESS INTENSIVE MANAGEMENT ALLOTMENTS

510	POLE BRIDGE	516	SOUTH MTN. IND.
520	INDIAN MEADOWS	586	TIPPEN HOMESTEAD
544	FELTWELL IND.	591	SOUTH MTN.-GRAZ. COOP.
558	FRANCONI	592	TROUT CR. IND.
559	SHEEP CR. IND.	594	TYSON HARDIMAN SP.
560	TROUT CR.-LEQUERIA	596	LONE TREE IND.
567	SOUTH MTN. AREA	598	WHITEHORSE ORE-IDA
564	OLD MAN		

MANAGEMENT WITH PRIVATE LANDS

453	HANLEY F.F.R.	515-3	BLACKSTOCK SP. F.F.R.
454	ANDERSON F.F.R.	523	CHIPMUNK FLD.
455	PAYNE F.F.R.	537	DOUGAL IND.
456	DOUGAL F.F.R.	543	STANFORD IND.
457	McKAY F.F.R.	545	FERRIS IND.
458	JOSEPHINE F.F.R.	555	HAZEN IND.
459	BROWN F.F.R.	566	MAHER F.F.R.
461	MUNRO F.F.R.	567	MAHER, Wm. IND.
463	PLEASANT VALLEY F.F.R.	575	MILLER F.F.R. IND.
464	COW CR. F.F.R.	577	BOGUS CREEK
465	QUINTANA F.F.R.	582	TROUT CREEK
466	THOMAS-COLASS	606	HARRIS IND.
467	GUSMAN F.F.R.	607	BALTZOR F.F.R.
469	McDANIELS F.F.R.	608	STANFORD F.F.R.
470	M. STANFORD F.F.R.	609	BERRETT F.F.R.
471	JACKSON-McBRIDE F.F.R.	610	STAPLES F.F.R.
472	JACKSON-McBRIDE F.F.R.	611	T. PAYNE F.F.R.
473	LEQUERIA F.F.R.	612	R. COLLINS F.F.R.
476	BUSH RANCH F.F.R.	613	STEINER F.F.R.
477	LOWERY F.F.R.	616	TYSON F.F.R.
479	NO NAME F.F.R.	618	JOHNSTONE F.F.R.
483	SALOVE F.F.R.	619	NETTLETON F.F.R.
485	REYNOLDS CR. F.F.R.	620	BASS F.F.R.
486	MURPHY F.F.R.	621	MASON F.F.R.
487	JOYCE F.F.R.	623	BULL BASIN F.F.R.
491	GRANNY-BOX "T"	624	JACA F.F.R.
492	O. BASS F.F.R.	625	BURGHARDT F.F.R.
504	BAHEM IND.	626	NANAS F.F.R.
511	LITTLE BOULDER F.F.R.	627	SOUTH MTN. IND. F.F.R.