

Sheep Complex, Big Springs and Owyhee Grazing Allotments Sensitive Bird Species Final Environmental Impact Statement



FES-06-14

May 2006

BLM

Elko Field Office / Nevada



BLM MISSION STATEMENT

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times.

Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific and cultural values.

BLM/EK/ES-06/015+1793

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Elko Field Office

3900 East Idaho Street

Elko, Nevada 89801-4611



In Reply Refer To:
1793/4130 (NV-012)

May 31, 2006

Dear Reader:

Enclosed is the *Sheep Complex, Big Springs, and Owyhee Grazing Allotments Sensitive Bird Species Final Environmental Impact Statement* (EIS). This EIS has been prepared by the Bureau of Land Management (BLM), Elko Field Office, following review by the U.S. District Court, Nevada District, of three multiple use decision issued in 2001 for the Sheep Allotment Complex, and 2002 for the Big Springs and Owyhee allotments. The EIS analyzes the impacts of livestock grazing on sage grouse in all three areas, and on sensitive raptors in the Big Springs and Owyhee allotments. The impacts of four alternatives are analyzed for each of the three decisions:

Alternative 1 - Re-issue Grazing Permits at Historic Levels (No Action)

Alternative 2 - Implement the Multiple Use Decision, As Modified (Proposed Action)

Alternative 3 - Grazing without Riparian Exlosures and Seedings

Alternative 4 - Adjust Grazing in Key Sensitive Species Habitat

This EIS is subject to review for a 30-day period, which will end on June 30, 2006. The document is being distributed to those on the EIS mailing list. It will also be posted on the internet at <http://www.nv.blm.gov/elko/planning.htm>.

Because the actions considered in this EIS concern the grazing of livestock on public lands, the description of BLM's proposed action in the EIS, Alternative 2, represents a proposed grazing decision. In accordance with regulations for grazing management found at 43 CFR 4160.2, any permittee or other interested public may protest the proposed grazing decision. A protest must be filed in writing within 15 days after receipt of the proposed decision, and should be addressed to:

BLM Elko Field Office
Helen Hankins, Field Manager
3900 East Idaho Street
Elko NV 89801

Comments not filed as a protest should be addressed to the Sensitive Bird Species EIS Project Manager, and may be provided at the above address, via facsimile to 775-753-0255, or by e-mail

to: bryan_fuell@nv.blm.gov. For additional information, please call Bryan Fuell at 775-753-0200.

Thank you for your interest in the management of public lands in northeastern Nevada.

Sincerely,

/s/

Helen M. Hankins
Field Manager

FINAL
ENVIRONMENTAL IMPACT STATEMENT
SHEEP COMPLEX, BIG SPRINGS AND OWYHEE GRAZING ALLOTMENTS
SENSITIVE BIRD SPECIES

Lead Agency: U.S. Department of the Interior
Bureau of Land Management
Elko Field Office

Cooperating Agency: Nevada Department of Wildlife

Project Location: Elko County, Nevada

**Comments on this EIS
Should be Directed to:** **Bryan Fuell**
EIS Co-Project Lead
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(775) 753-0200

Date Final EIS Filed with EPA: May 31, 2006 (FES-06-14)

**Date by Which Comments Must
Be Received by the BLM:** June 30, 2006

ABSTRACT

On April 14, 2003, three multiple use decisions made by the Bureau of Land Management (BLM) Elko Field Office for the Sheep Allotment Complex, Big Springs and Owyhee allotments were challenged in the United States District Court. On August 18, 2004, the U.S. Department of the Interior, BLM was directed to complete an Environmental Impact Statement (EIS) to determine impacts of livestock grazing with respect to the following sensitive birds:

Sheep Allotment Complex: Western burrowing owls, raptors and sage-grouse;

Owyhee Allotment: Western burrowing owls, raptors and sage-grouse; and

Big Springs Allotment: sage-grouse.

The Elko district is located in northeastern Nevada. The Sheep Allotment Complex and Big Springs Allotment are in the southeast corner and the Owyhee Allotment is in the northwest corner of the district.

This EIS analyzes the effects of four alternative grazing systems and proposed range improvements to the species and their habitat, including uplands, springs and riparian areas. The no action alternative is to re-issue the grazing permits that were in place prior to issuance of the multiple use decisions. Alternative 2 is BLM's proposed action. It would implement each of the multiple use decisions, as modified to include a phased approach to the level of grazing to be permitted, in combination with range improvement projects. It and two additional alternatives analyzed were developed with the goal of making significant progress in meeting rangeland health standards and multiple use objectives for the allotments. The two alternatives involve making adjustments to the grazing systems without some or all of the projects. BLM's preferred alternative is to implement the multiple use decisions, as modified (Alternative 2).

Responsible Official for FEIS: **Helen M. Hankins**
Manager, Elko Field Office

EXECUTIVE SUMMARY

INTRODUCTION

This Final Environmental Impact Statement (FEIS) was prepared by the Bureau of Land Management (BLM), Elko Field Office, in response to an August 18, 2004, U.S. District Court order, following review of three multiple use decisions by the Honorable Judge Howard D. McKibben, District of Nevada (CV-N-013-197-HDM (VFC)). The multiple use decisions reviewed included decisions for grazing, wildlife, and wild horse management within the following areas:

1. Sheep Allotment Complex – This complex is comprised of nine allotments, and consists of 454,066 acres of public land located in the southeastern corner of the county. BLM issued the multiple use decision in 2001.
2. Big Springs Allotment – The East and West Big Springs allotments consist of 479,088 acres located north and west of the Sheep Allotment Complex. The Big Springs Final Multiple Use Decision was issued in 2002.
3. Owyhee Allotment – The Owyhee Allotment consists of 371,431 acres of public land in the northwest corner of Elko County, and its multiple use decision was issued in 2002.

The EIS analyzes impacts of livestock grazing (including both sheep and cattle) on the following sensitive bird species:

- Sheep Allotment Complex: sage grouse and raptors, including Western burrowing owl;
- Owyhee Allotment: sage grouse and raptors, including Western burrowing owl; and
- Big Springs Allotment: sage grouse.

As ordered, *“To the extent applicable to these sensitive species the BLM shall evaluate the impacts of grazing, considering springs, seeps*

and riparian areas, uplands habitat and land use plans.”

The Draft EIS (DEIS) was distributed for public review in December 2005. Changes made as a result of public review include modifications to the proposed action and alternatives and to the analysis of direct, indirect and cumulative impacts of each alternative.

Based on the analysis, and considering any additional comments received during a 30-day public review period of this FEIS, the BLM, Elko Field Office will issue a Record of Decision concurrent with amendments to the grazing decisions in each of the multiple use decisions.

PURPOSE AND NEED

The purpose of the proposed action is to manage livestock grazing in the subject allotments to maintain and enhance productivity for all rangeland values, including habitat of the sensitive bird species. The need for action is to adjust grazing management to make significant progress toward meeting the *Standards and Guidelines for Rangeland Health* for the Northeastern Great Basin, and achieve the multiple use objectives established by the Elko or Wells Resource Management Plan, and Rangeland Program Summary.

RELATIONSHIP TO BLM POLICIES AND PLANS

All actions proposed were reviewed and found to conform to the two approved land use plans that cover the Elko District. For the Sheep Allotment Complex and Big Springs allotments, this includes 1985 Wells Resource Management Plan, as it has since been amended for wild horses, elk, and fire management. The Owyhee Allotment conforms to the 1987 Elko Resource Management Plan, which has also been recently amended for wild horses and fire management. The actions were further determined to be consistent with other federal, state and local laws, regulations, policies and plans to the maximum extent possible.

ALTERNATIVES

For each area, four alternatives are analyzed including a No Action alternative (Alternative 1) and BLM's Proposed Action (Alternative 2). BLM also considered five additional alternatives, but eliminated them from detailed analysis for reasons stated in chapter 2 (section 2.6).

As a result of public review of the DEIS, the action alternatives were modified to make grazing use adjustments under a phased approach based on monitoring. Changes include:

- Introduction of stocking levels, in terms of the number of animal unit months (AUMs) initially authorized that are below the calculated carrying capacity for the allotment. This is referred to as an interim system. The interim system defined in the DEIS for the East and West Big Springs was replaced.
- Addition of short-term objectives as terms and conditions on grazing permits, and disclosure of all allotment-specific objectives.

Under the modified alternatives, the difference between the initial stocking levels and permitted use (i.e., calculated carrying capacity) would be held in temporary suspension until monitoring shows that the allotment-specific objectives are being met.

The action alternatives also propose range improvement projects to implement the grazing strategy. Protection of riparian habitat within a given allotment is dependent, in part, on construction of riparian exclosures or pasture fences. Water developments, such as wells, or piping water from the springs to troughs outside of a riparian area, are also integral for implementation of the grazing strategies for most of the alternatives. Changes to the alternatives as described for the DEIS with respect to range improvements are:

- Categorization of proposed range

improvement projects, to distinguish between those needed to implement each alternative and those that would facilitate the alternative; and

- Incorporation of standard operating procedures for construction of projects.

All three action alternatives propose a grazing strategy and issuance of a term grazing permit with terms and conditions. Actual use and livestock carrying capacity of the allotments had been calculated as part of the allotment evaluation process. Development of a grazing strategy for each allotment included identification of pastures and/or use areas and periods of use that would improve specific conditions within the allotments. The AUMs that would be specified in the term permit for each allotment were based on the number of carrying capacity AUMs that may be removed in a given allotment, in accordance with the specified periods of use and permit terms and conditions.

Alternative 1 -- Re-issue Grazing Permits at Historic Levels

Alternative 1 would continue the grazing systems that were in place prior to the allotment evaluations that were completed in 2000. These evaluations identified the number of AUMs authorized by existing livestock grazing permits. The allotment evaluations determined that the grazing systems were not achieving rangeland health standards, thus adjustments were necessary. This conclusion led to development of and issuance of the three multiple use decisions. Because continuation of grazing as historically permitted is would not meet BLM's need for action, it is not considered a viable alternative for selection by the authorized officer. This alternative is included for comparative purposes only.

Alternative 2 -- Implement the Multiple Use Decision As Modified

With the modifications with respect to management of livestock grazing as noted above, Alternative 2 is BLM's Proposed Action.

Alternative 3 -- Permit Grazing without Riparian Enclosures and Vegetation Treatments

This alternative grazing system was developed as a result of public scoping comments expressing concerns for riparian enclosures and vegetation treatments proposed under the Multiple Use Decisions. The grazing system was modified to achieve riparian objectives without these range improvements. The periods and conditions under which grazing would be permitted were adjusted under this alternative to accommodate the riparian protection goals.

Alternative 4 -- Adjust Grazing in Key Sensitive Species Habitats

This grazing system was developed as a result of public scoping comments expressing concern about grazing impacts to use of habitat by the sensitive species, including the potential for range improvements to increase the establishment and spread of non-native species.

Under this alternative, range improvement projects were eliminated, as practicable, and

grazing season of use was adjusted to address specific wildlife habitat objectives.

Alternatives Considered But Eliminated from Detailed Analysis

Four alternatives were considered in the DEIS, and fifth alternative was considered but eliminated as a result of review of the DEIS.

The alternatives that were considered but eliminated from detailed consideration are:

- No Grazing
- Permit Grazing Based on Drought Conditions with Temporary Non-Renewable Use for Non-Drought Years
- Restore Non-Native Vegetation to Native Vegetation
- Change Type of Livestock from Sheep to Cattle (Sheep Allotment Complex)
- Limit Grazing Levels to Below Average Actual Use.

Sheep Allotment Complex - Comparison of Alternatives

	Alternative 1	Alternative 2 Proposed Action	Alternative 3 w/o Enclosures or Vegetation Treatments	Alternative 4 Adjust Grazing in Key Habitats
Permitted Use (Carrying Capacity)	39,915	26,652	Same as Alternative 2	Same as Alternative 2
Change From No Action (Percent Reduction)	n/a	-13,263 (or -33%)	Same as Alternative 2	Same as Alternative 2
Average Actual Use Initial Stocking Rate	17,573	17,474	Same as Alternative 2	Same as Alternative 2
Non-Use or Suspended Use (Percent of Permitted Use)	-22,342	-9,178 (or -34%)	Same as Alternative 2	Same as Alternative 2

Big Springs Allotments - Comparison of Alternatives

	Alternative 1	Alternative 2 Proposed Action	Alternative 3 w/o Exclosures or Vegetation Treatment	Alternative 4 Adjust Grazing in Key Habitats
Permitted Use (Carrying Capacity)	21,983	16,963	15,808	14,509
Change From No Action (Percent Reduction)	n/a	-5,020 (or -23%)	-6,175 (or -28%)	-7,474 (or -34%)
Average Actual Use Initial Stocking Rate	13,581	13,601	13,601	14,509
Non-Use or Suspended Use (Percent of Permitted Use)	8,402	-3,362 (or -20%)	-2,207 (or -14%)	0 n/a

Owyhee Allotment - Comparison of Alternatives

	Alternative 1	Alternative 2 Proposed Action	Alternative 3 w/o Exclosures or Vegetation Treatments	Alternative 4 Adjust Grazing in Key Habitats
Permitted Use (Carrying Capacity)	30,155	29,903	27,837	20,706
Change From No Action (Percent Reduction)	n/a	-252 (or < -1%)	-2,318 (or -8%)	-9,449 (or -31%)
Average Actual Use Initial Stocking Rate	18,862	23,247	Same as Alt.2	20,706
Non-Use or Suspended Use (Percent of Permitted Use)	-11,295	-6,656 (or -22%)	-4590 (or -16%)	0 (n/a)

**SUMMARY OF ENVIRONMENTAL
CONSEQUENCES**

Through the public scoping and DEIS review process, it was determined that grazing effects on sage grouse and the sensitive raptors were most likely to occur as a result of changes to the species' habitats. The habitats for these species include the sagebrush-bunchgrass communities, salt desert shrub community, riparian zones, and woodlands.

The analyses with respect to vegetation included short-term and long-term effects from herbivory. These effects were analyzed with respect to the time (i.e., season of use), duration (i.e., the period

of time over which the vegetation was subject to grazing), and the intensity (i.e., the amount of live tissue removed from the plant with respect to photosynthetic tissue, growing points, and carbohydrate production and storage). Each alternative was analyzed to determine if the proposed grazing systems would allow grazed plants to maintain vigor over the entire grazing cycle (i.e., short-term, from one to four years), as well as over multiple grazing cycles (i.e., the long-term). Grazing systems that permitted grazing during a season, over too long a period, or at too high an intensity level without some opportunity for plants to develop new growing points, restore photosynthetic tissue (i.e., leaves), and/or complete root growth and replacement, were

considered detrimental to the health of the plants, and therefore had potential for long-term impacts to the plant community.

In addition to the removal of plant tissue, the analysis also included effects to vegetation from concentration of livestock at water sources, along fences, and bedding areas (for sheep). These areas are not only subject to the herbivory, but also to hoof action that can result in shearing action to remove the plant.

The public also expressed concern about the effects of grazing and implementation of range improvements with respect to the establishment and spread of non-native, invasive species and subsequent reduction in habitat quality for the subject species. The analysis focused on the potential for surface disturbance, such as the construction of a pipeline or areas of concentrated livestock use. Linear type projects and road corridors were considered pathways for non-native, invasive species to spread. These areas of disturbance provide suitable seedbed conditions for many of the non-native, invasive species. In addition, an alternative which included areas where plant health was adversely impacted were considered as having high potential for non-native, invasive species to establish.

Riparian habitat is used in some way by all of the subject species, and therefore, this habitat component was also included in the analyses of each alternative on each of the subject allotments. For riparian vegetation, the analysis was similar to the analysis of the upland vegetation – the effects of herbivory and the effects of concentrated use of these areas by livestock (and wild horses). In addition, the range improvements proposed Alternatives 2 and 4 included troughs supplied by spring flows. The amount of water removed from the spring area and diverted to the trough was considered as a potential for reducing the area of the riparian vegetation associated with the spring.

Because riparian areas have higher soil moisture longer into the season, they are prime areas for non-native, invasive species to establish if the riparian vegetation is not healthy. Each of the

alternatives was evaluated with respect to the effects of the grazing system and range improvements on riparian vegetation.

For each of the subject avian sensitive species, the impacts analysis for vegetation, non-native, invasive species, and riparian areas for each alternative was examined to determine if the alternative would improve or degrade the species' habitat(s) or result in some other effect (e.g., disturbing sage grouse at leks during breeding season). For the raptor species, the potential impacts of each alternative on prey habitat was also examined, as number of prey species and prey abundance would be a function of the habitat quality.

Through this process, the effects of each alternative on vegetation, establishment and spread of noxious weeds, riparian habitats, and the subject avian sensitive species were determined.

For the Sheep Allotment Complex the analysis concluded that:

Alternative 1 (Re-Issue Grazing Permits at Historic Levels) was determined to have long-term adverse effects to shrub and grass vigor, high potential for establishment and spread of non-native, invasive species, long-term degradation of riparian zones, and long-term degradation of habitat for sage grouse, long-eared owl, short-eared owl, and to a lesser extent, the other raptors.

Alternative 2 (Implement the Multiple Use Decision) was determined to have potential to improve the upland vegetation (with some areas of continued adverse impact), decrease the establishment and spread of non-native species, improve the riparian vegetation, improve brood habitat for sage grouse in the short-term, potentially adversely impact sage grouse brood habitat over the long-term, improve sage grouse nesting habitat, improve habitat for long-eared and short-eared owls, and improve the overall habitat for the other raptor species.

Alternative 3 (Permit Grazing without Riparian Enclosures and Vegetation Treatments) was determined to have potential to improve the upland vegetation (with some areas of continued impact), increase the establishment and spread of non-native, invasive species, degrade riparian zones (primarily by wild horses) over the long-term, degrade raptor habitat, especially for long-eared and short-eared owls, and degrade sage grouse brood habitat over the long-term.

Alternative 4 (Adjust Grazing in Key Sensitive Species Habitats) was determined to have potential to improve upland vegetation greater than for Alternative 2 and 3, decrease the establishment and spread of non-native, invasive species, long-term degradation of riparian zones, improve raptor habitats, and improve sage grouse brood habitat over the short-term.

For the Big Springs Allotment the analysis concluded that:

Alternative 1 (Re-Issue Grazing Permits at Historic Levels) was determined to have long-term adverse effects to shrub (in areas of concentration) and grass vigor (in spring use areas), high potential for establishment and spread of non-native, invasive species, long-term degradation of riparian zones, and long-term degradation of brood and nesting habitat for sage grouse.

Alternative 2 (Implement the Multiple Use Decision) was determined to have potential to improve the upland vegetation (with some areas of continued adverse impact), decrease the establishment and spread of non-native, invasive species, improve the riparian vegetation, improve brood and nesting habitat for sage grouse, and reduce disturbance at leks.

Alternative 3 (Permit Grazing without Riparian Enclosures and Vegetation Treatments) was determined to have potential to improve the upland vegetation (with some areas of continued impact), result in the establishment and spread of non-native, invasive species, improve riparian vegetation (but not to the extent of Alternative 2), improve some sage grouse nesting and some

brood habitat, and degrade some sage grouse nesting and brood habitat.

Alternative 4 (Adjust Grazing in Key Sensitive Species Habitats) was determined to have potential to improve upland vegetation, decrease the establishment and spread of non-native, invasive species, improve riparian habitat more than Alternative 3, but not as much as Alternative 2, and improve sage grouse nesting and some brood habitat.

For the Owyhee Allotment Complex the analysis concluded that:

Alternative 1 (Re-Issue Grazing Permits at Historic Levels) was determined to improve grass and shrub vigor in the uplands with some areas of livestock concentration with adverse impacts to vegetation. The grazing system had moderate potential for establishment and spread of non-native, invasive species in the uplands, high potential in the riparian zones. The riparian areas were at risk of long-term degradation. The system would result in adverse impacts to sage grouse brood habitat, potential for long-term impacts to nesting habitat, and disturbance at leks during the breeding season. Degradation of habitat for long-eared owl and short-eared owl was likely to occur and habitat for prey species for most raptors would not be improved in the riparian habitats.

Alternative 2 (Implement the Multiple Use Decision) was determined to have potential to improve the upland vegetation (with some areas of continued adverse impact), decrease the establishment and spread of non-native species, improve the riparian vegetation, improve brood and nesting habitat for sage grouse, reduce disturbance at leks, improve habitat for raptors, especially long-eared and short-eared owls, and general improvement in habitat for prey species.

Alternative 3 (Permit Grazing without Riparian Enclosures and Vegetation Treatments) was determined to have potential to improve the upland vegetation (with some areas of continued impact), result in the establishment and spread of non-native, invasive species, improve riparian vegetation (but not to the extent of Alternative 2),

improve some sage grouse nesting and some brood habitat, degrade some sage grouse brood habitat, reduce disturbance at the leks, improve long-eared and short-eared owl habitats, and overall improvement in prey species habitats.

Alternative 4 (Adjust Grazing in Key Sensitive Species Habitats) was determined to have potential to improve upland vegetation (with some areas of continued impact), decrease the establishment and spread of non-native, invasive species, improve riparian habitat more than Alternative 3, but not as much as Alternative 2, improve sage grouse nesting and some brood habitat, reduce disturbance at leks, improve habitat for burrowing owl, short-eared owl, and long-eared owl, general improvement of prey species habitats.

AGENCY-PREFERRED ALTERNATIVES

In accordance with the National Environmental Policy Act, Federal agencies are required by the Council on Environmental Quality (40 CFR § 1502.14) to identify their preferred alternative in a FEIS. For each of the areas, BLM's preferred

alternative and Proposed Action is to Implement the Multiple Use Decisions as Modified, as described and analyzed in the FEIS as Alternative 2. The reasons for this preference are spelled out in section 2.8 of the FEIS, and are summarized as follows:

The preferred alternative and proposed grazing decision for each of the three areas is not the final agency decision. The Elko Field Office will issue the Record of Decision for this EIS concurrent with a final decision to amend the multiple use decisions with respect to grazing. The Record of Decision will be issued following consideration of any public comments received on the FEIS in the 30 days after its release. Concurrent with the ROD, or later depending on BLM's resolution of any protest received on any of the three proposed grazing decision, the Elko Field Office will also issue BLM's final grazing decision. The final grazing decision will be subject to administrative appeal in accordance with 43 CFR 4.470, 4160.3(c), and 4160.4.

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1.0 INTRODUCTION

1.1 Overview and Background

On April 14, 2003, three Multiple Use Decisions (MUDs) made by the Bureau of Land Management (BLM) Elko Field Office (EFO) for the Sheep Allotment Complex, Big Springs and Owyhee allotments (**Map 1-1, Appendix A**)¹ were challenged in the United States District Court for the District of Nevada. The challenge was with respect to the requirements of the Federal Land Policy and Management Act of 1976 (FLPMA), and its implementing regulations including the Fundamentals of Rangeland Health (FRH), and the National Environmental Policy Act of 1969 (NEPA), including its implementing regulations. Specifically, the legal action against the BLM sought declaratory and injunctive relief for the management of livestock grazing on the identified lands and a “halt to ecological degradation which grazing and livestock is causing upon those public lands.”

On August 18, 2004, the U.S. Department of the Interior, Bureau of Land Management (BLM) was directed to complete an Environmental Impact Statement (EIS) with respect to sensitive avian species for three MUDs issued by the BLM’s Elko Field Office. Per Minute Order by The Honorable Judge Howard D. McKibben, U.S. District Court, District of Nevada, CV-N-013-197-HDM (VFC), the EIS is intended to determine impacts of livestock grazing (including both sheep and cattle) with respect to the following sensitive birds:

- Sheep Allotment Complex: sage grouse (*Centrocercus urophasianus*) and raptors, including Western burrowing owl (*Athene cunicularia*);
- Owyhee Allotment: sage grouse and raptors, including Western burrowing owls; and
- Big Springs Allotment: sage grouse.

As ordered, “*To the extent applicable to these sensitive species the BLM shall evaluate the impacts of grazing, considering springs, seeps and riparian areas, uplands habitat and land use plans.*”

When Judge McKibben ordered that this Sensitive Species EIS be prepared, he did not also vacate the MUDs.

The Nevada Department of Wildlife (NDOW) is a cooperating agency for the development of the EIS.

The Draft EIS (DEIS) was distributed for public review on December 1, 2005. The public comment period extended through January 24, 2006. BLM received 40 comment letters.

Changes made in the DEIS as a result of public review of the DEIS include:

- Introduction of interim grazing systems in the Sheep Allotment Complex and Owyhee Allotment;
- Modification of the Final MUD interim grazing system for the Big Springs Allotments;
- Categorization of proposed range improvement projects to distinguish between those which are essential to the implementation of each alternatives and those that would facilitate the alternative;
- Inclusion of more site-specific analysis of the essential range improvement projects, including incorporation of standard operating procedures for construction;
- Addition of short-term key area objectives as terms and conditions on grazing permits;
- Disclosure of all allotment specific objectives for the allotments;
- Expanded analysis of cumulative impacts;

¹ All maps are included in Appendix A.

- Modified analysis of impacts of projects by allotment, due to categorization of essential projects and non-essential projects; and
- Incorporation of additional alternatives considered, but eliminated from detailed analysis.

1.2 Purpose and Need

The purpose of the proposed action is to manage livestock grazing in the subject allotments to maintain and enhance productivity for all rangeland values, including habitat of the sensitive bird species. The need for action is to adjust grazing management to make significant progress toward meeting the *Standards and Guidelines for Rangeland Health* for the Northeastern Great Basin Resource Advisory Council area and achieve the multiple use objectives established by the Elko or Wells Resource Management Plan (RMP), and Rangeland Program Summary (RPS). Through monitoring, livestock grazing in the subject allotments has been determined to be a causal factor in not making significant progress towards meeting some rangeland health standards. Therefore, changes in grazing management are required in order to meet these standards and achieve the multiple use objectives.

1.3 Relationship to BLM Policies and Plans

1.3.1 Land Use Plan Conformance

In his order to prepare this EIS, the Judge required that, *“To the extent applicable to these sensitive species the BLM shall evaluate the impacts of grazing, considering ... land use plans.”*

The proposed actions for the Sheep Allotment Complex and Big Springs Allotment conform to the following decisions and objectives of the Wells RMP, as approved July 19, 1985 and since

amended for wild horses, elk, and fire management:

1. Livestock Grazing (Wells RMP Record of Decision (ROD), page 17)
 - Provide for livestock grazing consistent with other resource uses.
 - Monitor and adjust grazing management systems and livestock numbers as required. Livestock use will continue to occur in all allotments Once sufficient monitoring information is obtained, livestock stocking rates may be adjusted according to what the range will support.
2. Terrestrial Wildlife Habitat (Wells RMP ROD, pages 19-22)
 - Conserve and/or enhance wildlife habitat to the maximum extent possible while eliminating all of the fencing hazards in crucial big game habitat, most of the fencing hazards in non-crucial big game habitat and all of the high and medium priority terrestrial riparian habitat conflicts in coordination with other resource uses.
 - Continue to monitor the interaction between wildlife habitat condition and other resource uses and consider adjustments in livestock seasons of use to improve or maintain essential and crucial wildlife habitats.
 - Designate and manage 6,200 acres as the Salt Lake ACEC to protect and enhance peregrine falcon habitat.
 - Protect, enhance and/or develop 250 spring sources for their wildlife values.
 - Active raptor nests adjacent to areas proposed for vegetation manipulation will be protected. On-the-ground work will be confined to the period preceding nesting activity or after the young have fledged (left the nest). Areas containing suitable nesting habitat will be inventoried for

active raptor nests prior to initiation of any project.

- Alteration of sagebrush areas either through application of herbicides, prescribed burning, or by mechanical means will be in accordance with procedures specified in the Western States' Sage-Grouse Guidelines, the Memorandum of Understanding between the Nevada Department of Wildlife and Bureau of Land Management, as amended, and as future studies might dictate.
3. Riparian/Stream Habitat (Wells RMP ROD, pages 22-23)
- Improve high and medium priority riparian/stream habitat to at least good condition. Improve stream habitat ... resulting in benefits ... to other resources such as watershed, wildlife, livestock, erosion, flood control, water quality and recreation.
 - Improve high and medium priority riparian/stream habitat to at least a good condition and prevent undue degradation of all riparian/stream habitat due to other uses.
 - Manage areas in good or better habitat condition so that further declines in habitat quality do not occur.

For the Owyhee Allotment, the proposed actions conform to the Elko RMP, as approved March 11, 1987, and since amended for wild horses and fire management including:

1. Livestock Management (Elko RMP ROD, page 20)
- Maintain or improve the conditions of the public rangelands to enhance productivity for all rangeland values.
 - Implement a rangeland monitoring program to determine if management objectives are being met and adjust

grazing management systems and livestock numbers as required.

2. Wildlife (Elko RMP ROD, pp. 29 - 30)

- Conserve and enhance terrestrial, riparian and aquatic wildlife habitat.
- Monitor the interaction between wildlife habitat condition and other resource use and make adjustments in season of use for livestock to improve or maintain essential and crucial wildlife.

3. Threatened, Endangered and Sensitive Species (Elko RMP ROD, Standard Operating Procedure (SOP), p. 40)

- Actions in threatened, endangered, or candidate species' habitat will be designed to benefit these species through habitat improvement.... Other species considered sensitive, but not under protection of the [Endangered Species] Act, are given special management considerations through Bureau policy. If adverse impacts to these other sensitive species are identified during project planning, the project will be modified or possibly abandoned to avoid these impacts.

Standard operating procedures (SOPs) pertinent to construction of range improvements are listed in **Appendix B**, and projects that would facilitate the proposed grazing strategy for each alternative are discussed in the reasonably foreseeable future actions section for each allotment. Consistent with pertinent laws, regulations and policy, the approved land use plans for the Elko district require monitoring of the interaction between wildlife habitat condition and other resource use, and that adjustments be made in livestock grazing when necessary to improve or maintain habitat for wildlife. All actions proposed as part of the MUDs are derived from evaluations of monitoring data for the grazing allotments. The Elko and Wells RMPs, as amended, and the allotment evaluations and multiple use decisions for the Sheep Allotment Complex, Big Springs Allotment and Owyhee Allotment, are available

for inspection upon request to the Elko Field Office.

1.3.2 Healthy Rangeland Standards and Guidelines

The Elko Field Office is within the Northeastern Great Basin Resource Advisory Council (RAC) area. In 1997 the RAC developed *Standards and Guidelines for Rangeland Health* for the area. In 2000, the RAC added standards and guidelines for wild horses. These standards and guidelines provide direction for BLM management, consistent with the objectives established by the Wells and Elko RMPs, as amended.

The rangeland health standards are:

1. Upland Sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, and land form.
2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.
3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover, and living space for animal species and maintain ecological processes. Habitat conditions meet the life cycle requirements of threatened and endangered species.
4. Cultural Resources: Land use plans will recognize cultural resources within the context of multiple use.
5. Healthy Wild Horse and Burro Populations: Wild horses and burros exhibit characteristics of a healthy, productive, and diverse population.

This EIS focuses on actions to help meet the standards for upland sites, riparian and wetland sites, and habitat requirements of the sensitive species. In addition, all actions would be in accordance with current procedures to protect cultural resources and manage wild horses at

appropriate levels. Issuance of the multiple use decisions includes establishment and monitoring use to meet allotment-specific management objectives, and these objectives are listed in Appendix C. All actions proposed by the MUDs and alternatives are consistent with meeting the standards and guidelines.

1.3.3 Guidelines to Manage Sage Grouse Populations and Their Habitats

In addition to the many other management objectives and/or standards that apply to sage grouse and/or sagebrush habitats, both the Wells and Elko RMPs require that alterations of sagebrush areas would be in accordance with the 1977 *Western States Sage-Grouse Guidelines*, as amended, and as future studies might dictate. In 2000 the Western Association of Fish and Wildlife Agencies (WAFWA) finalized an update of the 1977 guidelines. The BLM, U.S. Forest Service, and U.S. Fish and Wildlife Service signed a memorandum of agreement to consider these guidelines in their respective planning efforts, utilizing local expertise and quantitative data. In addition, the agencies are urged to “use an adaptive management approach, using monitoring and evaluation to assess the success of implementing these guidelines to manage sage-grouse populations”. In accordance with the existing land use plans and the 2000 Memorandum of Agreement, the BLM considers the WAFWA guidelines in all sage grouse and/or sagebrush habitat enhancement projects that occur on public lands and/or are federally funded. These guidelines encourage working collaboratively to improve rangeland health. The BLM recognize that these guidelines need to be adapted to local environments and based on scientifically credible ecological data collected and analyzed at the local level.

1.3.4 Guidance for Sage Grouse and Sagebrush Ecosystems

In Nevada, the BLM has recognized that generally lower moisture regimes prevail throughout the majority of Nevada's sagebrush

ecosystem. Therefore, BLM developed a set of sage grouse management guidelines consistent with the WAFWA guidelines, yet adapted to Nevada to provide interim guidance to BLM field managers without restricting options being explored for local sagegrouse conservation planning. The Nevada BLM Guidelines apply the most current sage grouse science to BLM activities, within the context of a multiple use mandate. Because they are consistent with the WAFWA guidelines and more specific to Nevada, the Elko Field Office would continue to consider the Nevada guidelines, together with the WAFWA guidelines, in managing resources and planning projects to enhance sage grouse and/or sagebrush habitat. The standard operating procedures for the various range improvements necessary for implementation of the alternatives have been reviewed and are consistent with the Nevada and WAFWA guidelines. Nevada BLM Guidelines specific to Fire Management, Emergency Fire Rehabilitation, and Vegetation Treatments have been incorporated into the *Elko* and *Wells RMPs Fire Management Amendment* as standard operating procedures (BLM 2003).

1.4 Relationship to Other Laws, Policies, and Plans

1.4.1 Migratory Birds

The International Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 *et seq.*) (MBTA) protects all migratory birds, including most raptors. With respect to the MBTA, Executive Order 13186 directs the federal agencies taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to integrate bird conservation principles, measures, and practices into agency activities, plans, and planning processes; restore and enhance the habitat of migratory birds, as practicable; and prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

1.4.2 Endangered Species Act and Bald and Golden Eagle Protection Act

The Endangered Species Act of 1973 (16 U.S.C. 1531-1544) and the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) prohibit the direct or indirect taking of an eagle, eagle part or product, or eagle nest. These acts allow for the Fish and Wildlife Service to issue a permit for any take. No take of any raptor protected by these acts is anticipated as a result of implementation of the proposed action or alternatives. Thus, no permit is required.

1.4.3 National Historic Preservation Act

Compliance with the National Historic Preservation Act (NHPA) is guided by the State Protocol Agreement between the Nevada BLM and the State Historic Preservation Office (SHPO). Decisions concerning inventory requirements and specific procedures to be followed both during and following inventories, including the production of reports, determinations of site eligibility, determinations of project effects to historic properties, and consultation with the State Historic Preservation Officer are detailed in the Protocol Agreement, as well as in BLM manual 8100 and the BLM's "Cultural Resources Inventory General Guidelines", 4th edition. The Elko Field Office strictly adheres to these documents as standard operating procedures in order to comply with Section 106 of the NHPA.

Inventories are generally not conducted during the issuance of general grazing permits; rather, they are completed during site specific project proposals. A discussion of the procedures followed to ensure that actions would not result in adverse impacts to significant cultural resources is provided in Appendix B, "Management Framework".

1.4.4 State Plans

1.4.4.1 Nevada and Eastern California Sage-Grouse Conservation Plan

A State Sage Grouse Conservation Team (State Team) was convened by the Governor of Nevada in August 2000 with the purpose of developing a strategy for conserving sage grouse in Nevada and providing an example for other states to follow. The State Team developed a strategy that included seven local working groups within Nevada and eastern California. The local working groups developed local sage grouse conservation plans that were combined into one comprehensive plan for Nevada and eastern California (State Plan).

The State Plan (NDOW 2005) basically outlines procedures for maintaining existing sage grouse habitats, identification of degraded habitats in need of restoration and/or rehabilitation, and projects to enhance key habitats. The proposed actions for the Sheep Allotment Complex, Owyhee, and Big Springs allotments are consistent with the State Plan.

1.4.4.2 Nevada Bird Conservation Plan

The Partners in Flight Working Group developed a statewide plan (Neel 1999) for bird conservation which provides objectives and strategies for conserving avian habitats, including sage grouse and raptors that are the focus of this EIS.

1.4.4.3 Nevada Comprehensive Wildlife Strategy

NDOW, in partnership with several conservation organizations, developed the State of Nevada Comprehensive Wildlife Conservation Strategy in 2005. This strategy was necessary to make Nevada eligible for federal funding under the State Wildlife Grants Program, and the Conservation and Reinvestment Act, if passed by Congress. The overriding goal of this strategy is "to maintain healthy, self-sustaining populations of Nevada's Species of Conservation Priority and their habitats" (NDOW 2005).

1.5 Significant Issues Addressed in this EIS

In making his ruling, the Honorable Judge McKibben indicated that the NEPA documents completed for the three MUDs were adequate for

all resources except for the sensitive bird species identified in the Minute Order. Many of the issues raised by the public during the scoping period for this EIS were determined to be beyond the scope of this EIS, as defined by the Minute Order.

Issues addressed by the alternatives and analyzed in Chapter 3 of this EIS area summarized in **Table 1-1**. Consistent with the court order, this EIS addresses the effects of the grazing actions proposed by four alternatives, including a no action alternative, to determine potential impacts on sage grouse, burrowing owls, and other sensitive raptors. Input received from the public during the scoping process and DEIS review process is discussed in Chapter 4.

1.6 Organization of this EIS

The Final EIS is published as two Volumes. Volume I includes the Chapters 1.0 through 8.0 and Appendices A, B, and C. Volume II includes Appendix D.

This chapter provides an overview and background, purpose and need statement, applicable regulatory requirements, and significant issues to be addressed. Chapter 2.0 describes the four alternatives in detail. Chapter 3.0 provides a description of the affected environment and environmental consequences of implementing the alternatives, recommends mitigation measures to reduce or eliminate impacts, identifies residual impacts, and identifies cumulative effects for each resource. Chapters 2.0 and 3.0 are organized geographically to consolidate the discussion of affected environment and environmental consequences of each alternative for a given allotment. Chapter 4.0 details the public participation and agency coordination conducted for the EIS process. Chapters 5.0 and 6.0 provide a list of preparers and the references used in preparation of the EIS, respectively. Chapter 7.0 consists of the glossary of terms and a list of acronyms used in the EIS. Chapter 8.0 is an index to the major subjects of the EIS. The maps that are called out in this EIS are in Appendix A. Appendix B includes additional information pertinent to

implementation of the actions analyzed in this EIS, consistent with the direction from approved RMPs and current guidance. Appendix C has been added to the EIS and includes Allotment-Specific Management Objectives.

Volume II includes Appendix D, the public comment letters on the DEIS and response to public comments.

Table 1 - 1: Elko Avian Sensitive Species EIS - Public Scoping Issues to be Addressed in the EIS

Public Scoping Comment	Issue
No adverse impacts to raptor habitat from grazing.	Grazing may affect the various resources which constitute the habitat for raptors and their prey.
Do not believe that their grazing has harmed habitat for raptors.	
Sheep Creek Allotment evaluation - Nesting and wintering habitat for raptors.	
Burrowing owl declining populations.	
Evaluation needs to address the habitat needs of raptors with respect to grazing.	
Raptor migration through Goshute Mountains.	Wild horse grazing may affect the various resources which constitute the habitat for raptors and their prey, and for sage grouse.
Concern for wild horse numbers and impacts.	
What are current avian species and their populations in the allotments?	Adequacy of the quantity and type of data used in the evaluation and available for EIS analysis.
What avian habitat components occur in the allotments?	
What are the habitat conditions?	
Lack of use pattern mapping data.	
What impacts has past grazing had on habitat conditions?	Analyze past, present, and reasonably foreseeable future actions.
Most avian species included in the EIS depend on sagebrush communities, except burrowing owl, which uses disturbed areas.	Inclusion of avian species and determination of available habitat type areas consistent with the Judge's order.
Antelope and elk populations expected to increase with water development implementation.	Impacts to other wildlife species were previously analyzed and are beyond the scope of this EIS.
NDOW still desires to reintroduce bighorn sheep in the Goshutes.	Bighorn sheep introduction would be considered if domestic sheep are either removed from the allotments or limited to the lower elevation areas.
Proposed action would result in potential for increased stocking rates; can Land Use Plan (LUP), RPS, and allotment goals be met?	Determination of appropriate stocking rates through the evaluation of Alternatives.
Proposed action would result in potential for increased stocking rates; can LUP, RPS, and allotment goals be met?	

Public Scoping Comment	Issue
State sage grouse conservation efforts should be included in the EIS analysis.	Analysis of grazing and range improvements should include consideration of sage grouse conservation efforts.
Altered fire cycles.	Grazing may affect fire ecology as related to changes in fuel and fire cycles.
How will proposed grazing systems and range improvements impact avian species and habitats?	Grazing and range improvements may affect the various resources which constitute the habitat for raptors and their prey, and sage grouse.
Non-game wildlife was not adequately covered in the Sheep Allotment Complex Evaluation	
Non-game wildlife was not adequately covered in the Big Springs Allotment Evaluation.	
Oppose crestline fence on the Pequops due to big game movements.	
Will range improvements be cost-effective?	
Issues in Squaw Creek watershed - non-functioning troughs, diversions to the creek, lack of maintenance of range improvements.	
Weeds in areas of livestock concentration.	
Over utilization of bitterbrush in Squaw Creek.	
More range improvements will lead to more roads and more habitat fragmentation for sage grouse.	
Sagebrush biome - has been degraded across the west.	
Sagebrush bird species summaries - Livestock impacts to birds need to be considered.	
Conservation strategies - issues - cheatgrass, altered fire regimes, invasive species microbiotic crusts.	
Threats to habitats to be addressed - list of threats.	
Altered composition and structure/lost productivity.	
Predator-prey relationships.	
Herbaceous cover for sage grouse and other special status species.	
Road rehab/restoration.	
Sheep Allotment Complex - water developments - condition, impacts, etc.	
Noxious weeds.	
Fourmile Butte well, pipeline and fence - concern that this project is going forward without the EIS being completed first. All issues raised in this letter have been previously raised in all of the other letters.	
Condition of springs indicated as wild horse issue, but livestock have also damaged springs.	Grazing and range improvements may affect the various resources which constitute the habitat for raptors and
Improvement of riparian areas at springs is necessary.	constitute the habitat for raptors and

Public Scoping Comment	Issue
<p>Full inventory and assessment of all springs, seeps, and wet meadows and study the role of historic and ongoing livestock impacts and other impacts (roads, mining, wild horses, etc.).</p> <p>Restoration actions for damaged or degraded riparian areas must be assessed under all alternatives.</p> <p>Intermittent/perennial drainages - livestock impacts - water quality, channel morphology, riparian vegetation, trampling.</p> <p>Desertification and watersheds - has this occurred and to what levels?</p>	<p>their prey, and sage grouse, including springs and riparian areas.</p>
<p>Sagebrush and other habitat assessments - must consider all habitats on regional basis</p>	<p>Determination of the analysis area and methods to encompass all indirect impacts as necessary.</p>
<p>Sage grouse.</p>	<p>Determination of effects of grazing and range improvements on the various resources which constitute the habitat for sage grouse.</p>
<p>BLM past management has failed to protect these water/habitat sources.</p>	<p>Determination of cumulative effects on water/habitat sources.</p>
<p>Concern for lack of woody vegetation along S.F. Owyhee River</p> <p>Suggestion for Wildlife Objective Technical Recommendation for Riparian Pasture.</p>	<p>Grazing and range improvements may affect the various resources which constitute the habitat for raptors and their prey, and sage grouse, including riparian areas.</p>
<p>Recommend inclusion of other avian species in the EIS; all BLM sensitive species.</p>	<p>Grazing and range improvements may affect other sensitive species in addition to raptors and sage grouse.</p>
<p>Fences are barriers and hazards to sage grouse and other wildlife.</p> <p>Range improvements - habitat degradation and fragmentation.</p> <p>Livestock range installations and vegetation treatments.</p> <p>Water hauling.</p>	<p>Range improvements may affect the various resources which constitute the habitat for raptors and their prey, and sage grouse.</p>
<p>Sagebrush mammal summaries - Livestock impacts to mammals, as prey species, need to be considered.</p>	<p>Grazing and range improvements may affect prey species.</p>
<p>Grazing suitability and capability analysis - BLM must re-evaluate old forage adjudication studies; must evaluate suitability of grazing on public lands.</p> <p>Livestock grazing suitability analysis.</p>	<p>Use of best information available on carrying (grazing) capacity.</p>
<p>Data collection for alternatives and analysis.</p>	<p>Use of current data and literature.</p>
<p>Regional analysis of special status species, landscapes/ecosystems, watersheds and aquifers for EIS.</p>	<p>Use of the most current data and science to evaluate the impacts of the Proposed Action and alternatives.</p>
<p>Die-off and drought.</p>	<p>Drought and die-off may interact with grazing management to produce cumulative effects.</p>

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2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

This chapter describes four alternatives that are analyzed in detail, and also includes a section on other alternatives that were considered, but eliminated from detailed analysis in this EIS. It ends with a summary comparison of the alternatives and their impacts, based on the analysis in Chapter 3 of this EIS.

The alternatives include the No Action Alternative (Alternative 1), which involves continuing the grazing systems that were in place prior to the allotment evaluation process. The allotment evaluation analysis determined that this “No Action” alternative was not achieving some of the Rangeland Health Standards or making significant progress toward some of the allotment objectives. Therefore, the No Action Alternative is not considered a viable alternative for selection, but does provide the baseline condition to which the action alternatives may be compared.

Implementation of the MUDs, as modified, is the Proposed Action (Alternative 2). In addition, the scoping process identified issues and potential alternatives for analysis that resulted in the development of two additional alternatives for the EIS. Grazing without riparian exclosures and vegetation treatments (Alternative 3) was developed in response to the concern regarding potential impacts of range improvements. Alternative 4 was developed in response to concern over the number of livestock and consists of reduced grazing in key sensitive species habitats where standards are not being met and/or significant progress is not being made, and livestock are determined to be the causal factor.

The description of each action alternative includes identification of range improvement projects believed essential to the implementation of the proposed grazing system, and those that

would facilitate the alternative are identified as reasonably foreseeable future actions. Each of the alternatives is described below for each of the subject allotments. To reduce or eliminate some impacts to resources, construction of range improvement projects would incorporate environmental protection measures (standard operating procedures) as identified in Appendix B. As a result of the public review of the Draft EIS, each of the action alternatives have been modified to incorporate additional features to ensure that progress is made towards meeting the rangeland health standards for upland, riparian, and sensitive species habitats. For reasons discussed in the summary comparison, BLM’s preferred alternative for all three areas (Sheep Complex, Big Springs and Owyhee) is the Proposed Action Alternative 2, Implement the Multiple Use Decision, as modified.

2.2 Actions Common to All Alternatives

The following resource protection measures, grazing permit terms and conditions, and monitoring actions are included as part of all alternatives.

2.2.1 Resource Protection Measures

All actions authorized by BLM are subject to the following resource management requirements from BLM policy and approved plans.

1. A term livestock grazing permit will be issued.
2. Administer all grazing and any developments or projects within WSAs in full compliance with the *Interim Management Policy for Lands Under Wilderness Review*.
3. Wild horse appropriate management levels (AML) were established in the MUD for each Herd Management Area (HMA) by allotment and this applies to all alternatives.

4. As budget and scheduling allows remove sufficient numbers of wild horses associated with the HMAs to attain the AML and maintain wild horse populations at a level which will maintain a thriving natural ecological balance consistent with other resource values.
5. Continue to remove all wild horses that occupy areas managed as horse-free areas.
6. Treat invasive and noxious weeds in a manner that is most appropriate to the weed species and degree of infestation. Treatment will be in accordance with the procedures outlined by *the Programmatic Environmental Assessment of Integrated Weed Management on Bureau of Land Management Lands* (BLM 1999; BLM/EK/PL-98/008, and any more current direction issued by the BLM.
7. Manage sage grouse habitat (i.e. leks, nesting, brooding, and summer and winter habitats) consistent with the *Western States Sage-Grouse Guidelines*, as adapted for use in Nevada.
8. As range improvement projects are planned, incorporate conservation measures from the 1999 *Nevada Bird Conservation Plan* and the 2005 *Nevada Comprehensive Wildlife Conservation Strategy* as recommended by NDOW, when practical.
9. Water will be left at the source for spring developments for wildlife (as required by Nevada Revised Statutes [NRS]). Well site investigations will be done by a trained employee prior to drilling any new wells².
10. Remove or retire non-functioning and/or unnecessary range improvements, and repair, redesign, or rehabilitate spring developments and fences to mitigate wildlife concerns and to improve habitat conditions, as time and funding allow.
11. Annual grazing authorizations will be adjusted in response to drought, fire, or other natural disturbances.
12. Project construction activities will incorporate environmental protection measures (Standard Operating Procedures) which are listed in **Appendix B.**

2.2.2 Permit Terms and Conditions

The following terms and conditions will be included in all grazing permits:

1. Authorized grazing use will be in accordance with the Assistant Field Manager's *Final Multiple Use Decision* as modified by the Record of Decision for this EIS.
2. Allotment-specific short term utilization objectives included in the term grazing permit should not be exceeded in any given year. As short term utilization objectives are approached, and before they are exceeded, livestock shall be moved to another area in the pasture or use area, removed to the next pasture/use area in the rotation, or moved off of the allotment.
3. Attainment of the short-term utilization objectives will be used as an indicator of progress toward or maintenance of the Standards for Rangeland Health, and as such, will be used to determine the level of livestock use to be authorized in a given year. Lack of attainment of these objectives will result in an adjustment in grazing use in the affected pasture/use area before the next grazing year.

² Currently, BLM cannot hold stockwater rights, and therefore, cannot contribute to water developments. The financial responsibility for implementation of water developments would be that of the permittee or others receiving benefit from the improvement.

4. The numbers of livestock to be grazed will remain flexible according to the needs of the permittee. The grazing system is based on the number of animal unit months³ (AUMs) that may be removed from each pasture/use area. Livestock numbers and periods of use would be applied for on an annual basis. Deviations beyond the flexibility described above and/or those described in the individual grazing systems may be allowed to meet the needs of the resources and the permittee as long as these deviations are consistent with multiple use objectives. Deviations beyond the limits of the flexibility outlined above, including deviations in the turnout date, increases in livestock numbers, and deviation from the grazing system, will require an application, and written authorization from the Assistant Field Manager for Renewable Resources prior to grazing use.
5. Payment of grazing fees would be made prior to livestock turnout. The current permit for the Owyhee Allotment includes the privilege of After-The Fact billing, in which case this does not apply.
6. The terms and conditions of grazing permits may be modified if additional information indicates that revision is necessary to conform with 43 CFR §4180.
7. Supplemental feeding would be limited to salt, mineral, and/or protein supplements in block, granular or liquid form. Such supplements will be placed at least one-quarter mile from live waters (springs, streams, and troughs), wet or dry meadows, and aspen stands.
8. An actual use report (Form 4130-5) showing use by use area within the allotment would be turned in within 15 days after completing annual use.
9. All range improvements will be maintained/repared by the permittee prior to livestock turn out and throughout the grazing season in accordance with range improvement authorization permits.
10. All riparian exclosures, including spring development exclosures, will be closed to livestock use unless specifically authorized in writing by the Assistant Field Manager for Renewable Resources.

These terms and conditions would implement Guidelines 1.1, 2.1, 2.4, 3.1, 3.2, and 3.3, which have been developed by the Northeastern Great Basin Resource Advisory Council of Nevada to establish significant progress towards conformance with the *Standards for Rangeland Health for Upland Sites, Riparian and Wetland Sites, and Habitat*.

2.2.3 Monitoring

The BLM would continue to conduct necessary monitoring studies and periodically evaluate the effects of grazing to determine if progress is being made in meeting the standards for rangeland health and multiple use objectives for each allotment (which are listed for each allotment in **Appendix C**). The allotments would be re-evaluated in accordance with priorities established in the Elko Field Office Monitoring and Evaluation Schedule. If monitoring studies indicate a need to bring grazing use in line with capacity, necessary adjustments would be made. Studies would be conducted in conformance with BLM policy manual guidance and associated handbooks and technical references, or the *Nevada Rangeland Monitoring Handbook*.

2.3 Sheep Allotment Complex Alternatives

The Sheep Allotment Complex encompasses 454,066 acres of mostly public lands in Elko

³ An animal unit month is the amount of forage necessary for the sustenance of one cow/calf pair or its equivalent (e.g., five sheep) for a period of one month.

County, Nevada (**Map 2-1, Appendix A**). Prior to the MUD, the complex consisted of eight allotments but two allotments were administratively created from UT/NV #1 Allotment through the 2001 Final MUD, creating nine total allotments (**Table 2-1**). The allotments are used as fall, winter, and early spring pastures for sheep.

Table 2 - 1: Sheep Allotment Complex - General Information for Individual Allotments

Allotment Name and Number	Acres of Public Land
	Total Acres
Leppy Hills (4322)	65,551
UT/NV North(0151)	78,913
UT/NV South (4320)	37,681
Lead Hills (4321)	80,603
White Horse (4353)	61,571
West White Horse (4352)	7,208
Boone Springs (4307)	78,936
Sugarloaf (4147)	23,170
Ferber Flat (4314)	20,433
Total	454,066

After the 2001 MUD was issued, seven of the nine allotments in the Sheep Allotment Complex

had been impacted by drought closures. The closures were issued in November 2003 and continue in effect on 2006. Monitoring would be conducted in the summer of 2006 to determine if any of the allotments would be re-opened for livestock grazing for the 2006-2007 grazing season.

2.3.1 Alternative 1 – Re-issue Grazing Permits at Historic Levels

Under this alternative, BLM would continue to implement the pre-2001 Sheep Allotment Complex MUD grazing management strategies with the existing range improvements (**Map 2-2, Appendix A**). The No Action Alternative grazing systems for the Sheep Allotment Complex are described below.

The historic stocking levels and average actual use by allotment and period of use for the Sheep Allotment Complex are detailed in **Table 2-2**. Total authorized use by livestock kind is 39,915 AUMs for sheep. The period of use is primarily winter, with early spring use in most of the allotments. During the period analyzed in the MUD, 1985 to 1999, the average actual use was 17,573 AUMs. This was 21,488 less AUMs than was permitted.

Table 2 - 2: Sheep Allotment Complex - Authorized Use, Historic Suspended Use (HSU), Voluntary Non-Use (VNU) and Period of Use

Allotment	Authorized Use (AUMs)	HSU	VNU	Period of Use	Average Actual Use (AUMS)
Leppy Hills	3,807 ¹	867	0	11/16 to 4/30	2,257
UT/NV North	4,325 ²	643	976	11/10 to 4/30	2,115
UT/NV South	6,599	3,249	0	11/10 to 5/10	1,690
Lead Hills	7,930	0	0	11/15 to 4/15	3,314
White Horse	7,500	0	0	11/15 to 4/15	2,154
West White Horse	670	330	0	11/15 to 3/31	564
Sugarloaf	3,105	0	0	11/15 to 4/20	1,979
Ferber Flat	2,735	0	0	11/20 to 4/20	1,498
Boone Springs	3,244	0	0	11/15 to 3/31	2,002
TOTAL	39,915	5,089	976		17,573

¹ On January 28, 2000, the Elko Field office issued a decision closing a portion of the Leppy Hills Allotment that burned in the 1999 Pilot Fire. This resulted in 260 AUMs placed in suspension during the closure.

² On June 15, 1999 the Elko Field Office issued a decision canceling 61 AUMs in the North Pasture of the UT/NV #1 Allotment. The AUMs were cancelled as a result of the Big Springs Ranch (BSR) Land Exchange.

Under this alternative, many of the allotment objectives were achieved; however, the allotment evaluation indicated that there were objectives that had not been met. The objectives from the Resource Management Plan, as well as objectives for Key Areas, Wild Horses, Wilderness, Recreation, and Standards for Rangeland Health are included in Appendix C. The attainment or non-attainment of the objectives and standards are indicated following the description of the objective or standard. Non-attainment of utilization objectives on a consistent basis was a primary factor in developing an alternative grazing system and implementing Resource Protection measures as described in Section 2.2.1.

2.3.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Under this alternative, livestock use would be managed in accordance with the Final Multiple Use Decision for the Sheep Allotment Complex (BLM 2001). In addition, this alternative includes a series of grazing management decisions, short-term key area utilization objectives (see Section 2.3.2.2), and specific permit terms and conditions in addition to those specified in Section 2.2.2 and other management actions (see Section 2.3.2.3). This alternative would implement grazing use adjustments suggested in the MUD. As a result of the public review of the DEIS, grazing use adjustments would be implemented under a phased approach based on monitoring. This is defined as the interim grazing system.

Under this alternative, the allotments would be divided into Use Areas, which are equivalent to pastures, except fences are not used to define the Use Areas (**Map 2-1, Appendix A**). Because sheep are herded, the herder is responsible for maintaining the sheep in the designated Use Area for the designated grazing period.

2.3.2.1 Grazing Management Decision

Rather than implement the grazing system using the calculated carrying capacity AUMs (26,652 livestock AUMs + 568 wild horse AML = 27,220

AUMs) (**Table 2-3**), the system would be implemented using the average actual use AUMs (17,474 total AUMs) during the period 1987 through 1999⁴ as indicated in **Table 2-2** above, which represents a 34 percent reduction from the calculated carrying capacity. The difference between the average actual use AUMs and the calculated carrying capacity AUMs (i.e., 9,178 AUMs) would be held in temporary suspension until short-term objectives are met, proposed range improvements are constructed, and monitoring shows the ability of the vegetative resources to sustain additional grazing use. The short term key area objectives would also be used to determine the sustainability of existing use and non-attainment of these objectives would result in adjustment of authorized use downward with reduced AUMs going back into temporary suspension. For the West White Horse Allotment, where the average actual use was higher than the carrying capacity established in the Sheep Allotment Complex FMUD, the initial grazing level would be the calculated carrying capacity.

The AUMs in temporary suspension would be restored when short-term objectives are achieved in all years of a grazing rotation cycle (i.e., three to four years, depending on the allotment). The AUMs would be restored at a rate to be determined by utilization goals and objectives, but not beyond the increases suggested by the FMUD carrying capacity calculations.

If, following the increase in AUMs, the short-term objectives are again exceeded, or if short-term objectives are not achieved during the initial cycle and livestock are determined to be the causal factor, use would be reduced equivalent to the change suggested by the carrying capacity calculations for the specific key area where objectives are not being met (i.e., the key area utilization values would not be averaged over the entire Use Area or pasture, but would be based on the key area where objective(s) are not being achieved). This calculation would be used to set

⁴ This period of use was selected because of drought closures and voluntary non-use between 2000 and 2005.

Table 2 - 3: Alternative 2 - Sheep Allotment Complex - Livestock AUMs, Wild Horse AML, and Total AUMs

Allotment	MUD Carrying Capacity		Alternative 2 - Desired Carrying Capacity (CC)		Total CC
	Livestock permitted use (AUMs)	Wild Horse AML (AUMs)	Livestock permitted use	Wild Horse AML (AUMs)	(Livestock and Wild Horses)
Leppy Hills	3,351	96	2,257	96	2,353
UT/NV North	3,704	108	2,115	108	2,223
UT/NV South	2,646	87	1,690	87	1,777
Lead Hills	5,609	12	3,314	12	3,326
White Horse	3,916	incidental use	2,154	incidental use	2,154
West White Horse	465	incidental use	325 325 465 ¹	incidental use	465
Sugarloaf	2,001	incidental use	1,979	incidental use	1,979
Ferber Flat	2,013	incidental use	1,498	incidental use	1,498
Boone Springs	2,947	265	2,002	265	2,267
Total	26,652	568	17,474	568	18,002

¹Two Use Areas would be used one out of three years; 465 AUMs are included in the total.

the allowable AUMs for the entire pasture or Use Area.

In addition, no livestock grazing would be permitted within ¼-mile of seep or springs or along riparian areas until riparian projects are constructed or until Proper Functioning Condition (PFC) of the riparian areas are attained.

During each grazing season, as utilization reaches the short-term utilization objective within a Use Area or allotment, livestock would be removed within five days.

Allotments that continue to be closed as of 2006 due to drought would be managed with the following criteria upon reopening and the first five years after reopening: if the utilization objectives are exceeded by one or more utilization class in a Use Area or pasture, that Use Area or pasture

would be rested the following year (for drought closure areas).

The actions proposed for the Sheep Allotment Complex include:

1. Establish the total number of AUMs of permitted use for livestock in the Sheep Allotment Complex as indicated in **Table 2-4**. The AML of wild horses for the Antelope Valley HMA is 144 to 259 and for the Goshute HMA is 74 to 123 wild horses. The AUMs allocated for wild horses is 568 AUMs.
2. Implement management systems and/or establish the season of use for each allotment in the Sheep Allotment Complex as indicated below and in **Table 2-4**.

Table 2 – 4: Alternative 2 – Grazing and Period of Use for the Sheep Allotment Complex

Allotment	Period of Use	Livestock Number	AUMs
Leppy Hills	11/01 to 2/28;	1,896	2,257
	3/01 to 4/30	1,896	
UT/NV North	11/01 to 2/28;	1,777	2,115
	3/01 to 4/30	1,777	
UT/NV South	11/15 to 2/28;	1,539	1,690
	3/01 to 4/30	1,539	
Lead Hills	11/01 to 2/28;	3,316	3,314
	3/01 to 4/15	3,316	
White Horse	11/15 to 2/28;	2,155	2,154
	3/01 to 4/15	2,155	
West White Horse	12/01 to 2/28	549	325
	12/01 to 2/28	549	325
	12/01 to 2/28	786	465
Sugarloaf	11/01 to 2/28	1,760	1,979
	3/01 to 4/20	1,760	
Ferber Flat	11/01 to 2/28	1,332	1,498
	3/01 to 4/20	1,332	
Boone Springs	11/01 to 2/28	2,016	2,002
	3/01 to 3/31	2,016	
Total			17,474

¹Two Use Areas would be used one out of three years; 465 AUMs are included in the total.

Leppy Hills Allotment. The allotment would be divided into three use areas (**Map 2-1, Appendix A**). Use Area A would be located from the Playa reservoirs south to the allotment boundary and west of BLM road #1050. Use Area B would be located north and east of the Goshute Mountains and Use Area A. Authorized use would be from November 1 to March 31 allotment-wide. The Morris Basin Use Area would be located in the Goshute Mountains. Approximately 450 AUMs occur in this basin, and grazing would be authorized on an annual review basis for this Use Area. When authorized, use would be from November 1 to December 1 and from April 1 to April 30. Unless specifically authorized in writing, no grazing would be allowed in the Morris Basin Use Area. Use Area A and Use Area B

would be used on a rest rotation schedule as indicated in **Table 2-5**.

Table 2 - 5: Leppy Hills Allotment Spring Use System

Year	Use Area
1	B
2	A
3	Repeat

Utah/Nevada North Allotment. The allotment includes three use areas (**Map 2-1, Appendix A**). Authorized use would be from November 1 to March 31 allotment-wide. The Oana corral is located in both Use Area A and B, and the permittee would be allowed to utilize the corrals each year for loading and handling. For the period April 1 to April 30 each year, the grazing system would rotate between Use Area A and Use Area B as

indicated in **Table 2-6**. In addition, approximately 976 AUMs occur in Morgan Basin Use Area, but grazing would be authorized on a pre-use review basis for this use area. Unless specifically authorized in writing no grazing would be allowed in the Morgan Basin use Area.

Table 2 - 6: UT/NV North Allotment Grazing System for the Period April 1 to April 30

Year	Use Area
1	B
2	A
3	Repeat cycle

Utah/Nevada South Allotment. Fall and winter use, November 1 to March 31 would be authorized allotment-wide. Use during April 1 to April 30 would occur west of Ferber Flat Road. Sheep would also be allowed in and around the Ferber Corral during shearing and loading times.

Lead Hills Allotment. Fall and winter use, November 1 to March 31, would be authorized allotment-wide, except that no grazing would be allowed in the ACEC after March 1. Spring use, April 1 to April 15 each year, would be made among three use areas on a rest rotation basis as indicated in **Table 2-7**. Use Area A would include all land to the west of Alternate Highway 93 and south of the Felt Wash to the allotment boundary (**Map 2-1, Appendix A**). Use Area B would include all of the land west of Alternate Highway 93 and north of Felt wash to the allotment boundary. Use Area C would include all of the land east of Alternate Highway 93 to the Ferguson Flat Road (BLM Road # 1118). No grazing would be allowed in the ACEC after March 1.

Table 2 - 7: Lead Hills Allotment Grazing Rotation for the Period April 1 to April 15

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

White Horse Allotment. Fall and winter use, November 1 to March 31, would be authorized allotment-wide. Use during April 1 to April 15 each year would be authorized among three of the four use areas on a rest rotation basis as indicated in **Table 2-8**. Use Area A would include all land west of Alternate Highway 93 from the north boundary of the allotment south to White Horse Pass (**Map 2-1, Appendix A**). Use Area B would include land from the West White Horse Allotment boundary north to one mile south of the Ibapah Road. Use Area C would include all land on the west side of the Goshute Mountains to the east of Antelope Valley on the upper foothills. Use Area D would include all of the land east of Alternate Highway 93 and north of the Ibapah Road to the Ferguson Flat Road (BLM Road # 1118), on its south and eastern boundary. Due to the close proximity of Use Area C to extensive white sage vegetation, this Use Area would not be included in the rotation, except through written authorization.

Table 2 - 8: White Horse Allotment Grazing Rotation for the Period April 1 to April 15

Year	Use Area
1	A
2	B
3	D
4	Repeat cycle

West White Horse Allotment. Winter use, December 1 to February 28, would occur in two use areas, the Valley Use Area and the Bench Use Area (**Map 2-1, Appendix A**). The Valley Use Area would be used in all years, and the Bench Use Area would be used only one out of every three years (**Table 2-9**). When the Bench Use Area is rested, 140 AUMs would be placed into non-use for conservation of the federal range. No sheep bedding would be allowed in the Bench Use Area of the allotment.

Table 2 - 9: West White Horse Allotment Winter Use Grazing

Year	Use Area
1	Valley
2	Valley
3	Valley and Bench
4	Repeat cycle

Sugarloaf Allotment. Fall and winter use, November 1 to March 31, would be authorized allotment-wide. Use during April 1 to April 20 would be among three use areas on a rest rotation basis as indicated in **Table 2-10**. Use Area A would include land to the west of the Ferber Flat Road (BLM Road # 1025) (**Map 2-1, Appendix A**). Use Area B would include all land from the northern extent of the Ferber Hills south to the allotment boundary. Use Area C would include land north of the Ferber Hills to the allotment boundary and west to the Ferber Flat Road.

Table 2 - 10: Sugarloaf Allotment Grazing Rotation for the Period April 1 to April 20

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

Ferber Flat Allotment. Fall and winter use, November 1 to March 31, would be authorized allotment-wide. Use during April 1 to April 20 would be among three use areas on a rest rotation basis as indicated in **Table 2-11 (Map 2-1, Appendix A)**. Use Area A would include land from Ferber Flat Road (BLM Road # 1025) west to the Upper Bench Road (BLM Road # 1026). Use Area B would include all land east of the Ferber Flat Road. Use Area C would include land from the Upper Bench Road west to Little White Horse Pass and south to the allotment boundary.

Table 2 - 11: Ferber Flat Allotment Grazing Rotation for the Period April 1 to April 30

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

Boone Springs Allotment. Two use areas have been identified for this allotment (**Map 2-1, Appendix A**). Use Area A would include the land north and west of Alternate Highway 93, with a capacity of 947 AUMs. Use Area B would include lands south and east of Alternate Highway 93, with a capacity of 2,000 AUMs.

Use Area B would be used during fall and winter, November 1 to February 28. Use in Use Area A would be uses from March 1 to March 31. Use in Use Area A would be limited to one in three years to limit any possible impacts to historic sage grouse leks in the western portion of the Boone Springs Allotment (**Table 2-12**).

When Use Area A is grazed, permitted use would be 947 AUMs and when Use Area B is grazed, permitted use would be 2,000 AUMs. The permittee

Table 2 - 12: Boone Springs Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	B
4	Repeat cycle

would limit use so as not to exceed permitted use within each Use Area.

3. Vacate the UT/NV#1 Allotment Management Plan (AMP) approved on November 8, 1972.
4. Construct the range improvement projects within the Sheep Allotment Complex as listed in **Table 2-13**, and shown in **Map 2-3, Appendix A**. The permittee will maintain all range improvements except for Ferguson Spring.

Table 2 - 13: Proposed Range Improvements for the Sheep Allotment Complex

Project	Allotment/Location	Units	Inside WSA
Exclosure	Leppy Hills/Rock Springs	¼ acre	yes
Well	Leppy Hills/Use Area B	1	no
Exclosure and trough	UT/NV North/Side Hill Spring	½ acre and 1 trough	yes
Exclosure and trough	UT/NV North/Morgan Basin Spring	¼ acre and 1 trough	yes
Exclosure and trough	UT/NV North/Spring Gulch Spring	¼ acre and 1 trough	yes
Exclosure and trough	Lead Hills/Felt Spring	¼ acre and 1 trough	yes
Exclosure	Lead Hills/Ferguson Spring	¼ acre	no
Exclosure and trough	Boone Springs/Perkins Spring	¼ acre and 1 trough	no

5. The permittee(s) would be assigned maintenance of existing spring developments and exclosures. Maintenance responsibility for the proposed Ferguson Spring Exclosure would be assigned to the NDOW.

Maintenance responsibility for other future spring developments and exclosures would be assigned to the party(s) deriving the primary benefit(s).

6. Establish new key areas in the Sheep Allotment Complex Continue to conduct necessary monitoring studies and periodically evaluate the effects of grazing to determine if progress is being made in meeting the multiple use objectives and standards for rangeland health. The Sheep Allotment Complex would be re-evaluated in accordance with priorities established in the Elko Field Office Monitoring and Evaluation Schedule. If monitoring studies indicate a

need to bring grazing use in line with capacity, necessary adjustments would be made. Studies would be conducted in accordance with BLM policy manual guidance as outlined in the *Nevada Rangeland Monitoring Handbook*.

2.3.2.2 Short-Term Key Area Objectives

The short-term objectives are utilization objectives for all the allotments. The following short-term Key Area Objectives must be met before any of the voluntary non-use AUMs would be reinstated.

1. Maximum utilization of 60 percent of previous year's growth on key herbaceous species by the end of the grazing season;
2. Maximum utilization of 50 percent of previous year's growth on salt desert shrub or other key shrubs (such as black sagebrush), by the end of the grazing season;

3. Maximum utilization of 30 percent on current year's growth on salt desert shrub and other key shrubs (such as black sagebrush), and 50 percent on key herbaceous species in spring use areas, based on use of current year's growth at the end of spring use; and
4. Allow for a maximum of ten percent utilization by wild horses prior to livestock turnout in the winter combined use areas.

The Standards and Guidelines for Rangeland Health, Wells Resource Management Plan Objectives (as amended), and Allotment-Specific Objectives (including Rangeland Program Summary Objectives) are all applicable and detailed in the MUD. These objectives are incorporated by reference. Other Short-Term and Long-Term Key Area Objectives and Riparian Objectives are included in **Appendix C**.

2.3.2.3 Permit Terms and Conditions

In addition to the permit terms and conditions that would apply to all grazing permits (Section 2.2.2), establish terms and conditions on each term grazing permit within the Sheep Allotment Complex that would read as follows:

1. No sheep camps will be located in WSAs or the ACEC.
2. No water hauling or placement of troughs will be allowed inside the boundaries of the Bluebell and Goshute Peak WSAs.
3. All hay for the use in and around sheep camps must be certified weed free prior to livestock turnout.
4. The livestock permittee is expected to move their livestock so as to not exceed established utilization objectives for previous years growth on fall and winter use areas (short term key area objectives 1 and 2), and/or current years growth in spring use areas (short term key area objective 3).
5. If BLM determines that objectives are being approached and will be exceeded before the scheduled livestock removal date, the permittee will be notified and will have five calendar days to remove livestock to other areas not yet having approached objective use levels, or remove livestock from the allotment.
6. If objective use levels are exceeded, scheduled off dates would be adjusted the following year to March 31, and remain in effect until monitoring for one complete grazing rotation cycle indicates incremental extensions or further reductions in period of use are warranted.
7. No livestock grazing will be permitted within ¼-mile of springs and seeps until exclosures are constructed or they are determined to be in proper functioning condition.
8. Sheep camps will only be located in areas approved by the authorized officer.
9. Sheep bedding areas will only be located in areas approved by the authorized officer. Sheep may not be bedded in the same location more than seven consecutive days before being moved. Once moved, the next bedding area may not be within ¼-mile of the last bedding area.
10. The permittee will submit a grazing application to the Elko Field Office prior to the start of the grazing each year describing use within each Use Area. Planned use would be reviewed in relation to permitted use.
11. Actual use reports will be specific to sheep camp/bedding areas within use areas.

2.3.2.4 Other Management Actions

The MUD also included actions and decisions with respect to fire management, wildlife, and wild horses, which are summarized below.

1. Construct wildlife water catchment projects within the Sheep Allotment Complex as outlined in EA BLM/EK/PL-97/018.
2. Establish and maintain an AML for wild horses within the Sheep Allotment Complex. The AML of wild horses for the Antelope Valley HMA is 144 to 259 and for the Goshute HMA is 74 to 123 wild horses. The total AUMs allocated for wild horses in the Sheep Allotment Complex is 568 AUMs (**Table 2-3**).
3. Inventory, identify, and eliminate existing wire hazards. Clean up and dispose of old wire, especially where it creates a significant hazard to wild horses.
4. Continue to collect combined use utilization data and collect wild horse use only utilization data.
5. Continue to collect seasonal wild horse distribution data on the Antelope Valley and Goshute HMAs.

2.3.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

This alternative is the same as Alternative 2 except the seven spring enclosures and associated troughs would not be constructed. Herding would be used to keep sheep away from the springs.

2.3.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, sensitive species habitats were identified for the Sheep Allotment Complex and livestock use was developed which would mitigate or reduce impacts to their habitats resulting from non-attainment of Standards of Rangeland Health, or where progress toward attainment was not being made and livestock were determined to be the causal factor. The key sensitive species habitats addressed by this

alternative include sage grouse nesting habitat and white sage or winterfat habitats that are important raptor prey species' habitat.

The grazing would be similar to Alternative 2, except all early spring grazing would be eliminated. The number of livestock would be reduced on the allotments for which spring grazing is eliminated (**Table 2-14**) Grazing would be restricted to the dormant season by ceasing all livestock use on March 31. The total carrying capacity for livestock would be 17,474 AUMs and 568 AUMs would be available for wild horses. Under this alternative, the spring sources would be protected with enclosure fencing. The grazing system would include the short-term objectives identified for Alternative 2, except the following short-term objective would not apply because there would be no spring use:

1. Maximum utilization of 30 percent on current year's growth on salt desert shrub and other key shrubs (such as black sagebrush), and 50 percent on key herbaceous species in spring use areas, based on use of current year's growth at the end of spring use.

The actions proposed for the Sheep Allotment Complex under this alternative include:

1. Establish the total number of AUMs permitted use for livestock and appropriate management level (AML) for wild horses for the Sheep Allotment Complex as indicated in (**Table 2-3**) until rangeland health standards are met.
2. Implement management systems and/or establish the season of use for each allotment in the Sheep Allotment Complex as indicated below and in **Table 2-14** and **Map 2-4, Appendix A**.

The Permit Terms and Conditions for Alternative 4 would be the same as for Alternative 2, except:

1. Term and Condition No. 4 would be revised as follows:

The livestock permittee is expected to move their livestock so as to not exceed

established utilization objectives for previous year's growth on fall and winter use areas (short term key area objectives 1 and 2).

Table 2 - 14: Alternative 4 - Period of Use, Livestock Numbers, and AUMs for Allotments in the Sheep Allotment Complex

Allotment	Period of Use	Livestock Numbers	AUMs
Leppy Hills	11/01 to 2/28;	2,273	2,257
	3/01 to 3/31	2,273	
UT/NV North	11/01 to 2/28	2,130	2,115
	3/01 to 3/31	2,130	
UT/NV South	11/15 to 2/28	1,702	1,690
	3/01 to 3/31	1,702	
Lead Hills	11/01 to 2/28	3,338	3,314
	3/01 to 3/31	3,338	
White Horse	11/15 to 2/28	2,169	2,154
	3/01 to 3/31	2,169	
West White Horse	12/01 to 2/28	549 ¹	325
	12/01 to 2/28	549	325
	12/01 to 2/28	786	465
Sugarloaf	11/01 to 2/28	1,993	1,979
	3/01 to 3/31	1,993	
Ferber Flat	11/01 to 2/28	1,509	1,498
	3/01 to 3/31	1,509	
Boone Springs	11/01 to 2/28	2,016	2,002
	3/01 to 3/31	2,016	
Total			17,474

¹Two Use Areas would be used one out of three years; 465 AUMs are included in the total.

2. Term and Condition No. 6 would be revised as follows:

If objective use levels are exceeded, scheduled off dates would be adjusted the following year by two weeks (earlier) and remain in effect until monitoring for one complete grazing rotation cycle indicates incremental extensions or further reductions in period of use are warranted.

Leppy Hills Allotment. The allotment would be divided into three use areas. Use Area A would be located from the Playa reservoirs south to the allotment boundary and west of BLM road #1050. Use would be authorized from March 1 to March 31. Use Area B would be located north and east of the

November 1 to February 28. Morris Basin Use Area would be located in the Goshute Mountains. Approximately 450 AUMs occur in this basin, but grazing would be authorized on an annual review basis for this Use Area. When authorized, use would be authorized from November 1 to December 31 and from March 1 to March 31. Unless specifically authorized in writing, no grazing would be allowed in the Morris Basin Use Area.

Utah/Nevada North Allotment. The allotment includes three use areas. Authorized use would be from November 1 to February 28 for Use Areas A and B. The Oana corral is located in both use areas and the

permittee would be allowed to utilize the corrals each year for loading and handling. For the period March 1 to March 31, the grazing system would rotate among the three use areas as indicated in **Table 2-15**. In addition, approximately 976 AUMs occur in Morgan Basin Use Area, but grazing would be authorized on a pre-use review basis for this use area. Unless specifically authorized in writing, no grazing would be allowed in the Morgan Basin Use Area.

Table 2 - 15: UT/NV North Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	Repeat cycle

Utah/Nevada South Allotment. Fall and winter use, November 15 to February 28, would be authorized allotment-wide. Use during March 1 to March 31 would occur west of Ferber Flat Road. Sheep would also be allowed in and around the Ferber Corral during shearing and loading times.

Lead Hills Allotment. Fall and winter use, November 1 to February 28, would be authorized allotment-wide. Late winter use, March 1 to March 31, would be made among three use areas on a rest rotation basis as indicated in **Table 2-16**. Use Area A would include all land to the west of Alternate Highway 93 and south of the Felt Wash to the allotment boundary. Use Area B would include all of the land west of Alternate Highway 93 and north of Felt wash to the allotment boundary. Use Area C would include all of the land east of Alternate Highway 93 to the Ferguson Flat Road (BLM Road # 1118). No grazing would be allowed in the ACEC after March 1.

Table 2 - 16: Lead Hills Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

White Horse Allotment. Fall and winter use, November 15 to February 28, would be authorized allotment-wide. Use during March 1 to March 31 would be among three use areas on a rest rotation basis as indicated in **Table 2-17**. Use Area A would include all land west of Alternate Highway 93 from the north boundary of the allotment south to White Horse Pass. Use Area B would include land from the West White Horse Allotment boundary north to one mile south of the Iapah Road. Use Area C would include all land on the west side of the Goshute Mountains to the east of Antelope Valley on the upper foothills. Use Area D would include all of the land east of Alternate Highway 93 and north of the Iapah Road to the Ferguson Flat Road (BLM Road # 1118), on its south and eastern boundary. Due to the close proximity of Use Area C to extensive white sage vegetation, this Use Area would be not be included in the rotation, except through written authorization.

Table 2 - 17: White Horse Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	D
4	Repeat cycle

West White Horse Allotment. Winter use, December 1 to February 28, would occur in two use areas, the Valley Use Area and the Bench Use

Area. The Valley Use Area would be used in all years, and the Bench Use Area would be used only one out of every three years (**Table 2-18**). When the Bench Use Area is rested, 140 AUMs would be placed into non-use for conservation of the federal range. No sheep bedding would be allowed in the Bench Use Area of the allotment.

Table 2 - 18: West White Horse Allotment Winter Use Grazing

Year	Use Area
1	Valley (325 AUMs)
2	Valley (325 AUMs)
3	Valley and Bench (465 AUMs)
4	Repeat cycle

Sugarloaf Allotment. Fall and winter use, November 1 to February 28, would be authorized allotment-wide. Use during March 1 to March 31 would be among three use areas on a rest rotation basis as indicated in **Table 2-19**. Use Area A would include land to the west of the Ferber Flat Road (BLM Road # 1025). Use Area B would include all land from the northern extent of the Ferber Hills south to the allotment boundary. Use Area C would include land north of the Ferber Hills to the allotment boundary and west to the Ferber Flat Road.

Table 2 - 19: Sugarloaf Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

Ferber Flat Allotment. Fall and winter use, November 1 to February 28, would be authorized allotment-wide. Use during March 1 to March 31 would

be among three use areas on a rest rotation basis as indicated in **Table 2-20**. Use Area A would include land from Ferber Flat Road (BLM Road # 1025) west to the Upper Bench Road (BLM Road # 1026). Use Area B would include all land east of the Ferber Flat road. Use Area C would include land from the Upper Bench Road west to Little White Horse Pass and south to the allotment boundary.

Table 2 - 20: Ferber Flat Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

Boone Springs Allotment. Two use areas have been identified for this allotment. Use Area A would include the land north and west of Alternate Highway 93, with a capacity of 947 AUMs. Use Area B would include lands south and east of Alternate Highway 93, with a capacity of 2,000 AUMs.

Use Area B would be used during fall and winter, November 1 to February 28. Use in Use Area A would be uses from March 1 to March 31. Use in Use Area A would be limited to one in three years to limit any possible impacts to historic sage grouse leks in the western portion of the Boone Springs Allotment (see **Table 2-21**).

Table 2 - 21: Boone Springs Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	B
4	Repeat cycle

When Use Area A is grazed, permitted use would be 947 AUMs and when Use Area B is grazed, permitted use would be 2,000 AUMs. The permittee would limit use so as not to exceed permitted use within each Use Area.

Springs MUD included creation of the West and East Big Springs allotments, and a reduction of the calculated carrying capacity apportioned to the two allotments.

The livestock permittee is expected to move their livestock so as to not exceed established utilization objectives for fall and winter use. Annual utilization on the previous year's growth in the three use areas would not exceed 50 percent on the salt desert shrubs and other key shrubs (e.g., black sagebrush), and 50 percent on key herbaceous species. When either utilization objective is reached, livestock would be removed from the allotment within five days.

The permittee would submit a grazing application to the EFO prior to the start of grazing each year describing the intended use within each use area. Planned use would be reviewed in relation to permitted use.

2.4 Big Springs Allotment

The Big Spring Allotment contains 479,088 acres (76 percent) of public (24 percent) of private lands, administered by the BLM's Elko Field Office. The Big Springs Allotment is located north and west of the Sheep Allotment Complex (**Map 1-1, Appendix A**). The allotment is divided by the crest of the Pequop Mountains, and 173,280 acres are west of the divide and 305,808 acres are east of the divide (**Map 2-2, Appendix A**). Private lands are intermingled with public lands, with 58 percent public land on the west side and 87 percent public land on the east side. The Big Springs Allotment was divided into two grazing use areas through a Rangeline Agreement. In 1995, the carrying capacity was calculated and AUMs were apportioned between two permittees for the West and East Big Springs Use Areas. In 1999, completion of the Big Springs Ranch Land Exchange (BSR Exchange), following BLM's issuance of the Big Springs Allotment Evaluation, resulted in increased AUMs in the East Big Springs Use Area. Issuance of the 2002 Big

2.4.1 Alternative I – Re-issue Grazing Permits at Historic Levels

Under this alternative, BLM would continue the pre-2002 Big Springs Allotment MUD grazing management strategies (**Map 2-2**). The No Action Alternative grazing systems for the Big Springs Allotment are described below.

1. The total allotment grazing privilege is 21,983 AUMs, apportioned as 16,598 AUMs within the East Big Springs grazing area and 5,385 AUMs within the West Big Springs grazing area (**Table 2-22**). The allotment was under a year-long grazing system (March 1 to February 28). Kind of livestock permitted within the allotment includes cow/calf pairs, dry cows, and yearlings.
2. Actual use during the last ten years for West Big Spring Allotment averaged 3,631 AUMs, with a low of 2,803 AUMs and a high of 4,402 AUMS. For the East Big Springs Allotment the actual use ranged from 5,199 AUMs to 11,929 AUMS, with an average of 9,950 AUMs over this same period.

Under this alternative, many of the allotment objectives were achieved; however, the allotment evaluation indicated that there were objectives that had not been met. The objectives from the Wells RMP, as well as objectives for Key Area, Wild Horse, Wilderness, Recreation, and Areas of Critical Environmental Concern, and Standards for Rangeland Health are included in Appendix C. The attainment or non-attainment of the objectives and standards are indicated following the description of the objective or standard. Non-attainment of utilization objectives and riparian objectives on a consistent basis were the primary factors in developing an alternative grazing system

Table 2 - 22: Big Springs Allotment Historic and Proposed Use AUMs

Allotment/Pasture	Alternative 1 Permitted Use (AUMs)	Alternative 2 Active Permitted Use (AUMs)
<i>West Big Springs Allotment</i>	5,385 ¹	4,788 ^{1,2}
Holborn Pasture	450	550
North Pequop Mountain Pasture	1,264	1,168
Independence Valley Pasture	3,651	2,750 ³
Fenced Federal Range (FFR)	20	20
Warm Springs Ranch Pasture (private)	n/a	n/a
<i>East Big Springs Allotment</i>	16,598 ¹	12,175 ^{1,2}
North Pequop Mountain Pasture	1,064	1,762
Upper Squaw Creek Riparian	Part of the North Pequop Mountain Pasture	To be Determined
Railroad Field/Seeding Pasture	88	255
Windmill Field/Seeding Pasture	98 ⁴	420
East Squaw Creek Pasture	470	330
Collar and Elbow Pasture	2,961	1,899
East Pequop Bench Pasture	3,096	3,069
Shafter Pasture	6,836	3,396
North of Home Pasture	116	116
Payne Basin Pasture and Six-Mile Canyon Pasture	828	756
Squaw Creek Ranch Pasture	55 ⁵	55
Lower Squaw Creek Ranch Pasture	6 ⁵	100
Fenced Federal Range (FFR)	17	17
Big Springs Ranch Pasture (private)	n/a	n/a

¹ Includes Fenced Federal Range (FFR) AUMs; 20 AUMs – West Big Springs and 17 AUMs – East Big Springs.

² The AUMs credited to owned and leased private lands intermingled with public lands would be reduced by the same percentage as public land permitted use. The AUMs placed in voluntary non-use would be reinstated as the range improvements are implemented and as standards and guidelines are met.

³ 3,050 AUMs would be authorized if stockwater is hauled to the northwest portion of the valley or if a new water source is developed in this area.

⁴ AUMs based on range survey data prior to seeding.

⁵ This pasture was all private land prior to the BSR Land Exchange of 1999. AUMS are based on range survey data.

2.4.2 Alternative 2 - Implement the Multiple Use Decision as Modified

Under this alternative, livestock use would be managed in accordance with the Final Multiple use Decision for the Big Springs Allotment (BLM, 2002a), as amended. In addition, this alternative includes a series of grazing management decisions, short-term key area utilization objectives, specific permit terms and conditions, and other management actions. This alternative also implements grazing use adjustments suggested in the MUD. As a result of the public review of the DEIS, grazing use adjustments would be implemented under a phased approach based on monitoring. This is defined as the interim grazing system.

The initial stocking levels for the interim grazing system would be 13,800 AUMs. The initial stocking rate is based on past use and voluntary non-use taken by the permittees, and calculations of the carrying capacity. The difference between the calculated carrying capacity (i.e., 16,963 AUMs) and the initial stocking rate AUMs (i.e., 13,800 AUMs), or 3,163 AUMs, would be held in temporary suspension until short-term objectives (see Section 2.4.2.2) are met, essential range improvements are constructed, and monitoring shows the ability of the vegetative resource to sustain additional grazing use. The short term key area objectives would also be used to determine the sustainability of existing use, and non-attainment of these objectives would result in adjustment of authorized use downward, with reduced AUMs going back into temporary

suspension. The terms and conditions and short-term key area objectives would apply to both the interim (initial) grazing system and the final grazing system.

2.4.2.1 Grazing Management Decisions

The 2002 FMUD divided the Big Springs Allotment into two separate allotments called East and West Big Springs Allotments with the dividing line on the crest/watershed, or nearly so, of the Pequop Mountains.

The actions proposed for the Big Springs Allotment include:

1. When fences are constructed to separate all or a portion of these two allotments, the dividing line created by the new fence(s) would be considered the actual allotment boundary (**Map 2-3, Appendix A**).
2. Establish the Total Number of AUMs of Permitted Use for Livestock within the West Big Springs and East Big Springs allotments as indicated in **Table 2-22**.
3. Implement livestock grazing management systems within the West Spring Allotments as follows:

(a) West Big Springs Allotment

Deferred rotation grazing would be applied to all pastures. The final grazing system includes construction of fences essential to implementation of the grazing system (**Table 2-23, and Map 2-3, Appendix A**).

Table 2 - 23: Proposed Range Improvements West and East Big Springs Allotments – Alternative 2

Project	Allotment/Location	Units
Allotment Boundary Fence	West and East Big Springs/Pequop Summit	3 miles
Pasture Fence	East Big Springs/North Pequop Mountain-East Squaw Creek Pastures	3 miles
Riparian Pasture Fence	East Big Springs/North Pequop Mountains	1½ miles
Exclosures and troughs	East Big Springs/North Pequop Mountains and Payne Basin	To be determined

Under this alternative, the grazing system included in the MUD for the Big Springs Allotment would not be fully implemented until essential projects are completed and monitoring of conditions demonstrates (through the achievement of short-term objectives) that additional grazing use is possible. A phased approach would be used to release the AUMs in temporary suspension. The interim grazing plan is described below.

Interim Grazing System

This grazing system replaces the interim system for Alternative 2 in the FMUD and DEIS in its entirety. The original interim system assumed that livestock could be held out of the East Squaw Creek

drainage during the hot season by using riding and herding techniques. This has proved to be ineffective as riding and herding could not be conducted often enough during the hot season. The new interim system is included in **Table 2-24** and incorporates changes in scheduled use with shorter periods of use in the crucial pastures with riparian concerns, allowing for a reduced dependence on herding. The riparian areas within the South Use Area of the North Pequop Mountains (which includes a portion of East Squaw Creek) would rotate between rest and late growing season use.

The initial stocking level (i.e., Permitted Use) would be 3,651 AUMs with 1,137 AUMs placed in Voluntary Non-Use.

Table 2 - 24: Interim Grazing System for West Big Springs Allotment

PASTURE/USE AREAS	YEARS 1 and 3	YEARS 2 and 4
Independence Valley Pasture ¹	9/01 - 6/30	9/01 - 6/30
Holborn Pasture	5/1 – 6/30	Rest
North Pequop Mountains		
North Use Area	7/1 – 9/30	7/1 – 9/30
South Use Area	Rest	5/1 – 6/30

¹Use in the Independence Valley pasture would be rotated through use areas as described in the FMUD.

Independence Valley Pasture. Some Use Areas would be grazed in the spring/early summer and the remaining Use Areas would be grazed in late summer/fall/winter/early spring. Generally, the areas grazed in the spring/early summer in one year would be grazed in late summer/fall of the next year. The southeast part of Independence Valley associated with Boxcar Well and North Boxcar Well would normally be reserved for late fall/winter use annually. Use Areas are associated with water sources in this pasture; there are no fences that separate the Use Areas within the pasture. Planned grazing would be

controlled by turning on and off stock water, which is provided by wells with the exception of the springs at the Warm Springs Ranch. Installation of a water pipeline and trough on private land and water hauling would be performed by the permittee to facilitate the grazing system. The general grazing system is detailed in **Table 2-24**. The apparent “ten months on” and “three months off” for this pasture schedule in **Table 2-24** does not reflect the distribution that would occur due use of several Use Areas. None of the Use Areas would receive more than about three months use, followed by at least one growing season of rest.

Holborn Pasture. Between early May and end of June, livestock would be moved from the Independence Valley Pasture into the Holborn Pasture north of Interstate 80. The rest rotation plan would allow growing season use one year followed by a complete year of rest. The amount of time livestock remain in the pasture is dependent on available water for adequate distribution. In dry years, livestock would be moved to the North Pequop Mountain pasture earlier than the planned turn out date.

North Pequop Mountain Pasture. In normal precipitation years the pasture would receive deferment from livestock grazing in the North Use Area. Movement into this Use Area in July would coincide with seed ripe or seed dissemination for most of the forage plants, resulting in deferment (i.e., growing season rest) each year.

The South Use Area would be rested one year and receive growing season use the following year, alternating with the Holborn Pasture.

This deferred rotation plan/rest rotation plan would require the cattle to be moved to the North Use Area each year from the Holborn Pasture and to the South Use Area in alternate years from the Independence Valley Pasture. The permittee would be responsible for monitoring livestock drift to the east side of this pasture, where the adjoining permittee grazes, and moving his livestock back to the west side in a timely manner. An important measure of the interim grazing system would be to remove livestock that drift into the East Squaw Creek and Upper Beacon Spring

areas until the proposed riparian management fences are constructed.

Livestock tend to drift to the south end of this pasture; therefore, the permittee would move livestock drifting to the south end back to the north end in a timely manner.

Final Grazing Plan

The final grazing plan would include the pasture rotation and schedules identified in the MUD (**Table 2-25**). Initial stocking levels would remain at the interim grazing plan levels until monitoring demonstrates changes are possible or needed. Based on performance, the AUMs could be increased to 4,788 AUMs.

The following is the essential range improvement for implementation of this system:

The East and West Big Springs Allotments Boundary Fence (three miles) is the proposed boundary fence within the North Pequop Mountain Pasture. The fence is proposed for approximately three miles from Interstate 80 at Pequop Summit to Rocky Point, with a short gap fence in the canyon immediately north of Rocky Point. This would be a four-wire fence in areas where heavy livestock pressure is expected and three-wire fence elsewhere. Most, if not all of this fence would be designed as a let-down fence, to be let down by September 30 and put up prior to entry of livestock the following year.

Other range improvements that would facilitate the grazing system are outlined in Section 2.7.2.2 (Reasonably Foreseeable Future Actions).

Table 2 - 25: West Big Springs Allotment Final Grazing System

<i>Independence Valley Pasture</i>		
USE AREAS	YEAR 1	YEAR 2
Boxcar Well	Late Fall/Winter (12/01 - 03/31)	Late Fall/Winter (12/01 - 03/31)
North Boxcar Well Miners Well Rattlesnake Well NE Water Haul Site Honor Camp Troughs	Spring/Early Summer (04/01 - 06/30)	Late Summer/Fall/Winter/Early Spring (09/01 - 03/31)
Section 12 Well Warm Springs Johnson Well NW Water Haul Site	Late Summer/Fall/Winter/Early Spring (09/01 - 03/31)	Spring/Early Summer (04/01 - 06/30)
The private field at the Warm Springs Ranch is often grazed in the late summer/fall offering an additional use area. This field is currently leased by the permittee.		
<i>Holborn Pasture</i>		
USE AREAS	YEARS 1 and 2	YEARS 3 and 4
Holborn Pasture	Early (05/15 – 9/30)	Late (07/01 – 09/30)
<i>North Pequop Mountain Pasture</i>		
USE AREAS	YEARS 1 and 2	YEARS 3 and 4
North	Late (08/01 – 09/30)	Early (05/15 – 09/30)
South	Early (05/15 – 09/30)	Late (08/01 – 09/30)

(b) East Big Springs Allotment

Deferred rotation grazing would be applied to all pastures receiving grazing use during the critical growing season. Pastures receiving only fall or winter use would be deferred from grazing during the growing season every year. The final grazing system uses terms and conditions, and includes short-term key area objectives (See Section 2.4.2.2) similar to the West Big Springs Allotment. The East Big Springs Allotment also utilizes an interim grazing system with a phased approach to changing livestock use which is based on achievement of the short term key objectives.

Interim Grazing Plan

The interim grazing system includes authorization of up to 12,175 AUMs of annual livestock use. However, 2,225 AUMs would be held in voluntary non-use until all essential range improvements have been completed and

monitoring of the allotment with respect to short-term key area objectives demonstrates that additional use is warranted or it is determined the additional use must be withdrawn to ensure progress toward attainment of Standards of Rangeland Health. The initial stocking level would be 10,150 AUMs.

This grazing system replaces the interim system for Alternative 2 in the FMUD and DEIS in its entirety. The original interim system assumed that livestock could be held out of the East Squaw Creek drainage during the hot season by using riding and herding techniques. This has proved to be ineffective when livestock are in a pasture with riparian areas during the hot season. The new interim system is included in **Table 2-26** and incorporates changes in scheduled use with shorter periods of use in the crucial pastures with riparian concerns allowing for a reduced dependence on herding.

Table 2 - 26: East Big Springs Allotment Interim Grazing System

PASTURE/USE AREA	YEARS 1 and 3	YEARS 2 and 4
Shafter	11/01 - 4/15	12/1 – 3/01
East Pequop Bench ¹	3/15 – 6/15 10/01 – 10/30	3/01 – 6/15 10/01 – 11/30
Collar and Elbow ²	6/16 – 1/31	7/01 – 12/15
East Squaw Creek	6/20 – 6/30 9/01 - 9/15	7/01 – 8/30
North Pequop Mountain ³		
North Use Area	7/01 – 9/30	Rest
South Use Area	Rest	5/01 – 6/30
Payne Basin	7/01 – 9/14	6/16 -9/05
Long Canyon/Six Mile	6/16 – 8/30	6/16 – 9/05
Railroad	Reserved Use	7/01 – 8/30
Windmill	8/01 – 9/15	7/01 – 8/30
North of Home	Drift Use	Drift Use
Squaw Creek Ranch	Drift Use/Gather	Drift Use/Gather
Lower Squaw Creek Ranch	Drift Use/Gather	Drift Use/Gather

¹Use of the East Pequop Bench Pasture would be rotated through use areas as described in the FMUD, with the exception of the North Bench area in East Pequop Bench, which would be deferred to last every year to minimize conflicts with sage grouse strutting and nesting.

²Livestock authorized in the North Pequop Mountain Pasture would be removed in a timely manner so that at the end of the growing season or grazing season, whichever occurs later:

- a) a minimum of four inches average stubble height of selected key herbaceous riparian species (sedges/rushes) would be left along the stream banks of East Squaw Creek and;
- b) Use on current year’s growth of aspen and willow along East Squaw Creek is 35 percent or less.

³ Collar and Elbow Pasture would be open as a place to move cattle when utilization objectives on East Squaw Creek in the North Pequop Mountain Pasture are met.

In years 1 and 3, livestock would winter in the Shafter Pasture. Starting around 15 March, livestock would move into the East Pequop Bench pasture, where they would follow the rotation described in the FMUD. Use in the North Bench Use Area of this pasture would be deferred until last to minimize any potential conflicts with sage grouse strutting and nesting. Starting in mid-June, the cattle would be split, with cattle going to the Collar and Elbow, East Squaw Creek, and Long Canyon/Six Mile pastures. The cattle in Collar and Elbow would remain there through August; the cattle in East Squaw Creek would spend ten days

there before going to the north end of the North Pequop Mountain pasture.

Cattle would be removed from the North Pequop Mountain pasture when utilization objectives along East Squaw Creek are met, at which time they would be moved to Railroad Field, Windmill Seeding, and Collar and Elbow pastures.

Other parts of the herd would summer in the Long Canyon/Six Mile and Payne Basin pastures. If utilization levels along East Squaw Creek allow, livestock would remain in the north end of that pasture until 1 September, at which time they would pass again through East Squaw Creek for another fifteen days. All

livestock would be removed to the private fields through September. Some cattle would go back to Collar and Elbow for some late fall/winter use, while the rest of the herd would spend October in East Pequop Bench before entering Shafter pasture on 1 November. The cattle in Collar and Elbow would be moved to Shafter by 31 January.

In years 2 and 4, livestock would leave Shafter Pasture by 1 March. The cattle would use East Pequop Bench from 1 March through 15 June, using the rotation system between Use Areas outlined in the FMUD. The North Bench use area in this pasture would be deferred until last in this pasture to minimize any potential impacts to sage grouse strutting and nesting. Starting in mid-June, the herd would be split, with some cattle going to Payne Basin and Six Mile/Long Canyon pastures. Starting on 1 May, some livestock would move into the North Pequop Mountain Pasture, where they would remain until the end of June or until utilization objectives along East Squaw Creek are met. On July 1, these cattle would be moved to Collar and Elbow, East Squaw Creek, Railroad, and Windmill pastures. By early September all cattle would be moved into the private fields. Cattle would re-enter the range around early October, with some cattle going to Collar and Elbow Pasture and the rest going to East Pequop Bench Pasture. Starting around 1 December, all livestock would be moved to Shafter for the winter.

Final Grazing Plan

The final grazing plan would be the same pasture rotation and schedules identified in the MUD (**Table 2-27**). Initial stocking levels would remain the same as for the interim system until monitoring demonstrates increases are warranted (i.e., short-term objectives outlined in Section 2.4.2.2 have been achieved),

and the essential range improvement projects in **Table 2-23** have been installed. These projects are described below.

The East and West Big Springs Allotments Boundary Fence (three miles) within the North Pequop Mountain Pasture is proposed for approximately three miles from Interstate 80 at Pequop Summit to Rocky Point, with a short gap fence in the canyon immediately north of Rocky Point. This fence is proposed as a let-down fence to be let down by September 30 and put up prior to entry of livestock the following year.

The North Pequop Mountain/East Squaw Creek Pasture Fence consists of approximately three miles of fence from a connection with the proposed allotment boundary fence eastward along the northern side of East Squaw Creek to a connection with the Squaw Creek Ranch fence. The upper portion of this fence would be a let-down design to be let down by September 30 and put up prior to entry of livestock the following year. This fence would require water gaps into East Squaw Creek. This fence would be a three-wire fence, but four-wire fence would be used where livestock pressure is anticipated to be high. Liberty pipe may be used for portions of the fence that are not required to be let-down. Elk jumps or other facilities to promote elk passage would be installed along natural corridors.

The Upper East Squaw Creek Riparian Pasture Fence consists of one and one-half miles of fence running east from the Squaw Creek Ranch fence, running along the south side of East Squaw Creek and would fully enclose the length of the perennial portion of the main channel, except for water gaps. This fence would be a three-wire fence, but four-wire fence would be used where

livestock pressure is anticipated to be high. Liberty pipe may be used for

Table 2 - 27: East Big Springs Allotment Final Grazing System

PASTURE/USE AREA	YEARS 1 & 2	YEARS 3 & 4
Shafter	10/01 - 4/15	10/01 - 4/15
East Pequop Bench North Bench/Seeding/Long Canyon	05/01 - 07/15	03/01 - 05/15 09/01 - 12/31
South Bench/Seeding/Hardy Creek	05/01 - 07/15	03/01 - 05/15 09/01 - 12/31
Pipeline seeding	03/01 - 05/15 09/01 - 12/31	05/01 - 07/15
Pipeline native	03/01 - 05/15	05/01 - 07/15
Payne Basin	05/16 - 09/30	07/01 - 09/30
Six-Mile Canyon	Period of use to be defined on an annual basis.	Period of use to be defined on an annual basis.
East Squaw Creek South seeding	04/01 - 10/15 Period of use to be defined on an annual basis.	04/01 - 10/15 Period of use to be defined on an annual basis.
North native	05/01 - 10/15	07/01 - 10/15
North Pequop Mountain East Beacon/South Squaw Creek North Squaw Creek/Baker Spring	05/01 - 07/31 07/01 - 09/30	07/01 - 09/30 05/01 - 07/31
Upper Squaw Creek riparian	Initially rest until proper functioning condition (PFC), then Up to 3 Weeks 05/01 - 07/31 ¹	Initially rest until PFC, then Up to 3 Weeks 05/01 - 07/31 ¹
Squaw Creek Ranch	Up to 3 Weeks 05/01 - 07/31 ¹	Up to 3 Weeks 05/01 - 07/31 ¹
Lower Squaw Creek Ranch	Up to 3 Weeks 08/01 - 10/31	Up to 3 Weeks 08/01 - 10/31
Windmill Seeding	04/01 - 10/31 Period of use to be defined on an annual basis.	04/01 - 10/31 Period of use to be defined on an annual basis.
Railroad Seeding	07/01 - 10/31	05/01 - 10/31
Collar & Elbow	08/15 - 01/31	08/15 - 01/31
North of Home	Period of use to be defined on an annual basis.	Period of use to be defined on an annual basis.

¹The following stubble height/utilization limits would apply:

- Stubble Height of Herbaceous Riparian Species: A minimum of four inches average stubble height of selected key herbaceous riparian species (sedges/rushes) would be left along the stream bank at the end of the growing season or grazing season, whichever occurs later.
- Willow Utilization: Do not exceed 35 percent average utilization of the total current year's leader growth on the portion of the willow within five feet of ground level by the end of the growing season or grazing season, whichever occurs later.
- Aspen Utilization: Do not use more than 30 percent of available aspen stems by the end of the growing season or grazing season, whichever occurs later.

portions of the fence to accommodate wildlife movement and in snow pocket areas. Elk jumps or other facilities to promote elk passage would be installed along natural corridors.

Spring exclosures in the North Pequop Mountain and Payne Basin pastures would be considered to enclose springs to protect the spring source. In addition, existing spring developments would be evaluated for re-development that would allow water to remain at the source instead of capturing the entire spring flow and conveying all of the water away from the spring.

Other range improvements that would facilitate the grazing system are outlined in Section 2.7.2.2 (Reasonably Foreseeable Future Actions).

Shafter Pasture. This pasture would be the primary area for winter/early spring use. Livestock would graze this pasture beginning in November, using the northern part of the pasture (Silver Zone Use Area) in November and then moved south to the use area associated with Shafter Well #1, Shafter Well, and Shafter Well #2 until mid-April. However, late winter/early spring use occurs on the west side of the Shafter Pasture when snowmelt and/or rains provide sufficient water for use in this area. The Shafter wells would be turned off and the livestock would be moved to the greasewood flats and sagebrush draws. The livestock would be moved out of this pasture in March to mid-April (**Table 2-27**).

East Pequop Bench Pasture. Fire rehabilitation actions following the Big Springs Fire of 2000 resulted in the installation of a fence on the south end of the fire and seeding in the burned area. The fence separates the northern part of the east Pequop bench from the

remainder of the pasture. This North Use Area is closed to livestock grazing until the seeding establishment criteria have been met. Until the North Use Area is open, the South Bench/Hardy Creek Use Area and the Pipeline Use Area (east of Big Springs Ranch) would be available for livestock use. Grazing in the use areas would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this pasture. Deferred grazing use of each use area during the critical growing season two out of every four years is the goal. However, during the period of fire closure of the North Use Area, use in the South Bench, Hardy or Pipeline use areas would be planned so that utilization of key forage species would not exceed 40 percent use by the end of the critical growth period.

Payne Basin Pasture. This pasture would receive two years of use which includes critical growing season followed by two years of deferred use.

Six Mile Canyon Pasture. This pasture would receive two years of use which includes the critical growing season followed by two years of deferred use. In years of use during the critical growth period of key forage species (May 15 to July 15), utilization would be managed so as not to exceed 40 percent. In years of deferment (after July 15), utilization would be managed so as not to exceed 50 percent of the key forage species.

East Squaw Creek Pasture. The grazing of this pasture would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this pasture. The South Seeding portion of this pasture would be grazed each year between April 1 and October 15. Grazing in the spring prior to the livestock being

moved into the North Pequop Mountain Pasture, and grazing again in the late summer/fall as the livestock come off of the summer range would be the most common use of this pasture. Use during late summer/fall would depend on the level of use made in the spring and the amount of regrowth available for later use.

The native portion of this pasture would be grazed in conjunction with the seeding on the south end; however, use in the native area is expected to be light because most of the livestock tend to graze the South Seeding portion of this pasture. In the event that the level of grazing use on the native key forage grasses at the Key Area exceeds the light utilization category by the end of the growing season for two years in a row, or more than two out of four consecutive years, use on the native area would be deferred until July 1 for two out of four consecutive years.

North Pequop Mountain Pasture. This pasture is the primary summer range for the livestock operation. The portion of this pasture associated with Upper East Squaw Creek and East Beacon Spring encompasses most of the riparian areas within this pasture. Deferred rotation grazing would be applied to uses areas within this pasture. Livestock would graze the upper East Squaw Creek and East Beacon spring areas between May 1 and July 31, and then move north to the Baker Spring/Pipeline area. The Baker Spring/Pipeline area would be grazed from as early as July 1 to September 30 in conjunction with the Railroad and Windmill Seeding Fields. The permittee would be responsible for monitoring livestock drift outside the planned use area(s) and moving them back to the planned use area(s) in a timely manner.

Railroad Field and Windmill Seeding Field. The grazing system calls for these

two fields to be used in conjunction with the Baker Spring Use Area in the North Pequop Mountain Pasture. These two fields would be needed to supplement the forage for summer use when the livestock are not to be grazing the Upper East Squaw Creek and East Beacon Spring use areas in the North Pequop Mountain Pasture.

Squaw Creek Ranch Field. This field includes a portion of East Squaw Creek and would be managed as a riparian pasture with use limited to no more than three weeks. Monitoring of the utilization on stream bank herbaceous riparian plants and willows would be used to determine if further adjustments would be made in order to achieve proper functioning condition and habitat objectives. The grazing of this riparian pasture would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this pasture.

Lower Squaw Creek Ranch Field. This field has been irrigated to grow meadow grasses for livestock use in late summer/fall. This field would continue to be irrigated by the permittee and grazed up to three weeks between August 1 and October 31. The grazing of this field would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this field.

Collar and Elbow Pasture. This pasture would be used beginning on or after August 15 for late summer/fall/early winter use. The valley portions of this pasture tend to be dusty when the dry surface is disturbed during summer/fall. To avoid dust pneumonia in the calves, the permittee plans to wean the calves from the mother cows, generally around August 20 or later, before placing the mother cows in this pasture.

North of Home Pasture. Use in this pasture is generally trailing livestock to and from other pastures; however, some livestock may periodically be held in this pasture for a longer period of time. Because of the variability in the use of this pasture, the grazing of this pasture would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this pasture. If this pasture is to be grazed annually during the critical growth period for key forage species (May 1 to June 30), utilization would be managed so as not to exceed 40 percent. If this pasture is deferred at least two out of four years until July 1, utilization would be managed so as not to exceed 50 percent. Planned use would be directed toward maintaining healthy forage plants and a stable watershed for the Source Water Area Protection Zone associated with the watershed that supplies water to West Wendover, Nevada.

The BLM would continue to conduct necessary monitoring studies and periodically evaluate the effects of grazing to determine if progress is being made in meeting the multiple use objectives and standards for rangeland health. The Big Springs Allotment(s) would be re-evaluated in accordance with priorities established in the Elko Field Office Monitoring and Evaluation Schedule:

(a) Establish new key areas or conduct supplemental studies in the select locations.

(b) Studies would be conducted in accordance with BLM policy manual guidance as outlined in the *Nevada Rangeland Monitoring Handbook* and other technical references.

2.4.2.2 Short-Term Key Area Objectives

Both the interim and final grazing systems would be governed by the achievement of short-term key area utilization objectives. Livestock would be moved out of the pasture as utilization levels are approached. If utilization levels are exceeded in any given year, livestock use would be adjusted before the next grazing season.

The following short-term Key Area Objectives must be met before any of the voluntary non-use AUMs would be reinstated.

1. The utilization objective for native key forage grasses is 50 percent use, not to exceed 55 percent in any single year.
2. The utilization objective for introduced seeded grasses is 65 percent use, not to exceed 70 percent in any single year.
3. The utilization objective for native half-shrubs as white sage and saltbush is 55 percent, not to exceed 60 percent in any single year.
4. The utilization objective for bitterbrush is 25 percent use by livestock at the end of the summer use period and 45 percent use by wildlife and livestock combined, at the end of winter.
5. The utilization objective applicable to wild horses is 10 percent use by wild horses prior to entry by livestock on winter range and 55 percent use by wild horses and livestock combined at the end of winter.
6. A minimum of four inches average stubble height of selected key herbaceous riparian species (sedges/rushes) would be left along the lentic and lotic areas in both East and West Big Springs allotments at the conclusion of livestock use.
7. Use on current years growth of aspen and willow along East Squaw Creek and other upland riparian sites containing this woody riparian resource does not exceed

35 percent by the end of the grazing period.

2.4.2.3 Permit Terms and Conditions

Establish terms and conditions as follows:

1. The livestock permittees are expected to move their livestock so as to not exceed established short term key area objectives.
2. If BLM determines that objectives are being approached and will be exceeded before scheduled livestock removal date, permittee will be notified and will have five calendar days to remove livestock to other areas within the pasture/use area not yet having approached objective use levels, to the next pasture in the schedule, or off the allotment.
3. If short term key area utilization objectives are exceeded, period of use for the next grazing period in that pasture/use area will be reduced by a minimum of two weeks where it shall remain until additional changes are indicated through monitoring. Period of use adjustments will apply to the next grazing season.
4. Period of use extensions will be authorized only after two consecutive years of use with monitoring which indicates incremental extensions in period of use are warranted.

The Standards and Guidelines for Rangeland Health, Wells Resource Management Plan Objectives (as amended), and Allotment-Specific Objectives (including Rangeland Program Summary Objectives) are all applicable and detailed in the MUD. These objectives are incorporated by reference. Other Short-Term and Long-Term Key Area Objectives and Riparian Objectives are included in **Appendix C**.

2.4.2.4 Other Management Actions

The MUD also included actions and decisions with respect to watershed protection, wildlife, and wild horses, which are summarized below.

1. Drinking Water Source Protection Plan for the City of West Wendover, Nevada. The BLM agrees not to locate or allow the location of any Potential Contamination Sources (PCS), as defined by the United States Environmental Protection Agency and the Nevada Division of Environmental Protection, in Protection Zones 1, 2 ,3, and 4, so far as this is consistent with the authority granted to BLM to regulate public land activities.
2. Modify the wire spacing on the West Pequop Bench Fence (#5608) to meet current BLM specifications. On three-wire fences, the wire spacing would be 18"-10"-12" from the ground up, and the bottom wire would be smooth. On four-wire fences, the wire spacing would be 18"-6"-6"-12" from the ground up, and the bottom wire would be smooth.
3. Inventory the remaining fences on public lands and modify those fences to BLM specifications as needed to facilitate the movement of big game.
4. Modify existing fences and design new fences to facilitate the movement of deer, antelope, and elk, and to reduce maintenance costs.
5. Establish an AML range for wild horses of 34 to 56 wild horses for 12 months (408 to 672 AUMs) within that portion of the Goshute HMA in the Shafter Pasture of the Big Springs Allotment.
6. Prepare a Population Management Plan to guide the management of wild horses within the Goshute Herd Area to ensure that wild horse populations maintain their free-roaming, self-sustaining, genetically viable status.

7. Inventory, identify, and eliminate existing wire hazards. Clean up and dispose of old wire, especially where it creates a significant hazard to wild horses.
8. Continue to collect pre-livestock use by wild horses and combined use (cattle and horses) utilization data.
9. Continue to collect seasonal distribution and census data on the Goshute HMA. Continue to collect seasonal distribution and census data on horse populations that are occupying areas managed as horse-free.
10. Do not construct the fence described in the Wells RMP Wild Horse Amendment that was intended to prevent wild horses from drifting north into the checkerboard land pattern of the Goshute Herd Management Area.

2.4.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, the interim grazing system for both the East and West Big Springs allotments would be as described under Alternative 2. The terms and conditions, short-term key area utilization objectives, and other management actions are the same as for Alternative 2. The difference between Alternative 3 and Alternative 2 are that to implement Alternative 3, the Upper East Squaw Creek Riparian Pasture Fence and the spring exclosures in the East Squaw Creek Riparian Pasture and Payne Basin Pasture would not be constructed, but the West Squaw Creek Riparian fence would be included in Alternative 3. The West Squaw Creek Riparian Fence would connect the Pequop Summit Fence with the Holborn/North Pequop Mountain pasture fence. Approximately four miles of fence, most of which would be three-wire, would be constructed. Four-wire fence may be used where livestock pressure

is anticipated to be high. Liberty pipe may be used in portions of the fence to accommodate wildlife movement and in snow pocket areas. Elko jumps or other facilities would be installed to promote elk passage at natural movement corridor locations.

2.4.3.1 Grazing Management Decisions

The actions proposed for the Big Springs Allotment under Alternative 3 include:

1. Divide the Big Springs Allotment into two separate allotments called East and West Big Springs Allotments with the dividing line on the crest/watershed divide, or nearly so, of the Pequop Mountains. When fences are constructed to separate all or a portion of these two allotments, the dividing line created by the new fence(s) would be considered the actual allotment boundary.
2. Establish carrying capacity for each pasture as indicated in **Table 2-28**.
3. The essential range improvements identified in **Table 2-29** would be constructed under this alternative (**Map 2-3, Appendix A**). The East Squaw Creek Pasture Fence and West Squaw Creek Riparian Fence are included in this alternative to provide riparian habitat protection.
4. The initial permitted use for the interim grazing system would be established as indicated in **Table 2-30**.

This alternative would include the same interim grazing systems for East and West Big Springs allotments as described in Section 2.4.2.1. The final grazing system would not be fully implemented until essential projects are completed and monitoring of conditions demonstrates (through the achievement of short-term objectives) that additional grazing use is possible. A phased approach would be used to release the AUMs in temporary suspension.

Table 2 - 28: Alternative 3 - Carrying Capacity by Pasture - West and East Big Springs Allotments

Pasture	Carrying Capacity (AUMs)
West Big Springs Allotment	
Independence Valley	3,050 (2,750)*
Holborn	550
West Squaw Creek Riparian	399
North Pequop Mountain (West)	769
Fenced Federal Range (FFR)	20
Subtotal	4,788
East Big Springs Allotment	
North Pequop Mountain (East)	1,139
Railroad Field	255
Windmill Field	420
East Squaw Creek Riparian	623
East Squaw Creek	330
Collar & Elbow	1,899
Shafter	3,396
Squaw Creek Ranch	55
Lower Squaw Creek Ranch	100
North of Home	116
Payne Basin/Six Mile	756
East Pequop Bench	3,069
Fenced Federal Range (FFR)	17
Subtotal	12,175

* 3,050 AUMs authorized if stockwater is hauled to northwest portion of valley or if a new water source is developed in this area.

Table 2 - 29: Range Improvements Essential for Implementation of Final Grazing System for the East and West Big Springs Allotments - Alternative 3

Project	Allotment/Location	Units
Allotment Boundary Fence	West and East Big Springs/Pequop Summit	3 miles
Riparian Fence	West Big Springs/North Pequop Mountains	4 miles
Pasture Fence	East Big Springs/North Pequop Mountain-East Squaw Creek Pastures	3 miles

The interim system incorporates changes in scheduled use with shorter periods of use in the crucial pastures with riparian concerns, allowing for a reduced dependence on herding.

The final grazing system proposed under Alternative 3 is provided in **Table 2-30**. The combination of the East and West Big Springs

Boundary Fence, the Upper East Squaw Creek Pasture Fence, and the West Squaw Creek Pasture Fence would create two riparian pastures encompassing the East and West Squaw Creek drainages. These fences would allow for the implementation of a grazing system with spring use every other year in these pastures, with rest years in alternate years. Holborn Pasture in the

Table 2 - 30: Big Springs Allotment - Alternative 3 Final Grazing System and Permitted Use

Pasture	Years 1 and 3	Years 2 and 4	# Livestock*	AUMs
East Big Springs Allotment				
Shafter	10/1-4/15	10/1-4/15	602	3,396
East Pequop Bench	4/1-7/31	4/1-7/31	879	3,069
Payne Basin	No use	5/1-6/30	357	623
East Squaw Creek Riparian	5/1-6/30	No use	357	623
North Pequop Mountain	7/1-9/30	7/1-9/30	433	1,139
Collar & Elbow	8/15-1/31	8/15-1/31	390	1,899
East Squaw Creek	7/1-9/30	7/1-9/30	125	330
Railroad Field	7/1-9/30	7/1-9/30	97	255
Windmill	7/1-9/30	7/1-9/30	159	420
Squaw Creek Ranch	Up to 3 Weeks 5/1-7/31	Up to 3 Weeks 5/1-7/31	**	55
Lower Squaw Creek Ranch	Up to 3 Weeks 8/1-10/31	Up to 3 Weeks 8/1-10/31	**	100
North of Home	Period of use to be defined on an annual basis	Period of use to be defined on an annual basis	**	116
FFR				17
Total				11,419
West Big Springs Allotment				
Independence Valley	9/15-6/30	9/15-6/30	519	3,050
W. Squaw Creek	No use	5/1-6/30	337	399
Holborn**	5/1-6/30	No Spring Use	337	550
	9/15-9/30	9/15-9/30	488	151
North Pequop Mountain	7/1-9/30	7/1-9/30	431	769
FFR				20
Total				4,389**

* This is the maximum number of cattle that can be run in this date range in each pasture. Actual numbers would be determined through the annual grazing planning and application process. These figures assume percent public land remains at 87 percent (East Side) and 59 percent (West Side). Livestock numbers may decrease if percent public land increases.

** Holborn pasture would be used early every other year and late every year. Use in spring and fall years would be 550 AUMs, and use in fall only years would be 151 AUMs.

West Big Springs Allotment and Payne Basin in the East Big Springs Allotment would be grazed during the spring on years when the Squaw Creek Riparian pastures are rested. Holborn and Payne Basin pastures would be rested in the years that the Squaw Creek Riparian pastures are grazed.

This grazing use would allow the spring complexes in the East Big Springs Allotment to remain unfenced except for one complex in the North Fork of East Squaw Creek that would be north of the pasture fence. Therefore, this

complex would be in an area to receive hot season use on a yearly basis. Grazing use in all other spring/summer/fall pastures would continue under the deferred use rotational patterns, allowing those pastures to complete two full growing seasons before the onset of grazing in two years out of four. North Pequop Mountain and Collar and Elbow pastures would continue to receive deferred use every year. The water developments proposed would provide additional water sources for livestock and wildlife across both allotments. Permitted use in both allotments would drop to account for the AUMs that would

not be available on an annual basis due to the rested pastures.

Carrying capacity for each pasture would remain the same as in the MUD, with the North Pequop Mountain AUMs split between the new riparian pastures.

2.4.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative permit terms and conditions, short-term utilization objectives, and other management actions are the same as for Alternative 2. Under this alternative, sensitive species habitats were identified for the East and West Big Springs allotments, and livestock use was developed which would mitigate or reduce impacts to their habitats resulting from non-attainment of Standards of Rangeland Health, or where progress toward attainment was not being made and livestock were determined to be the causal factor. The key sensitive species habitats addressed by this alternative include sage grouse breeding habitat (leks), nesting habitat, and summer brood habitat.

The grazing system would be adjusted to permit 3,971 AUMs in the West Big Springs Allotment and 10,538 AUMs in the East Big Springs Allotment, including FFR AUMs. The AUMs were reduced from the carrying capacity of the two allotments to account for the reduced use in the North Pequop Mountain Pasture.

2.4.4.1 Grazing Management Decisions

The actions proposed for the Big Springs Allotment under Alternative 4 include:

1. Establish carrying capacity for each pasture as indicated in **Table 2-31**.
2. There are no range improvements essential to implement the final grazing system under Alternative 4. Other range improvements that would facilitate the grazing system are outlined in Section 2.7.2.2 (Reasonably Foreseeable

Future Actions) and depicted on **Map 2-4, Appendix A**).

The grazing system proposed under Alternative 4 is provided in **Table 2-32**. The grazing system would implement rotational deferred use in Independence Valley and East Pequop Bench pastures during the critical growing season. Use in all other pastures would occur either after the end of the growing season or during the dormant season.

Use in North Pequop Mountain pasture would be limited to September 15 to October 31 annually to eliminate any potential livestock impacts to sage grouse nesting and summer brood habitat in that pasture. Grazing use in the portion of the East Pequop Bench pasture that contains sage grouse leks would occur after the end of the sage grouse strutting and early brood rearing periods, at which time these birds have normally moved into the adjacent fenced private fields. This alternative would eliminate all proposed fencing in the North Pequop Mountain pasture. The two permittees would be responsible for monitoring drift across the allotment boundary, both on the divide between East and West Squaw creeks and in the flats off the north end of the Pequop Mountains. Payne Basin pasture would be used every other year during the spring.

The grazing system would eliminate the need for fencing the spring complexes in North Pequop Mountain and Payne Basin pastures. The water projects would provide additional water sources for wildlife and livestock. The proposed seedings would use native plants to the extent that selected species could be expected to survive in adequate numbers to meet objectives. Some of the seedings not already enclosed within pasture fences may need additional temporary and/or permanent protection fence to allow those seedings to establish. AUMs would be reduced on both allotments to account for the reduced use in the North Pequop Mountain pasture.

Table 2 - 31: Alternative 4 - Carrying Capacity by Pasture – West and East Big Springs Allotments

Pasture	Carrying Capacity Under this Alternative (AUMs)
<i>West Big Springs Allotment</i>	
Independence Valley	3,050 (2,750)*
Holborn	550
North Pequop Mountain (West)	1,168
Fenced Federal Range (FFR)	20
Subtotal	4,788
<i>East Big Springs Allotment</i>	
North Pequop Mountain (East)	1,762
Railroad Field	255
Windmill Field	420
East Squaw Creek	330
Collar & Elbow	1,899
Shafter	3,396
Squaw Creek Ranch	55
Lower Squaw Creek Ranch	100
North of Home	116
Payne Basin/Six Mile	756
East Pequop Bench	3,069
Fenced Federal Range (FFR)	17
Subtotal	12,175

*3,050 AUMs authorized if stockwater is hauled to northwest portion of valley or if a new water source is developed in this area.

Table 2 - 32: Big Springs Allotment - Alternative 4 Grazing System

Pasture	Years 1 and 3	Years 2 and 4	# Livestock ¹	AUMs
East Big Springs Allotment				
Shafter	11/1-4/15	11/1-4/15	715	3,395
East Pequop Bench ²	4/15-4/30 6/6 – 8/31	4/15-8/31	715	2,843 2,106
Payne Basin	5/1-6/5	No use	715	737
East Squaw Creek	8/15-9/15	8/15-9/15	360	329
Windmill Seeding	8/15-9/15	8/15-9/15	355	325
North Pequop Mountain	9/15-10/31	9/15-10/31	715	961
Railroad Field	7/1-9/30	7/1-9/30	190	255
Collar and Elbow	9/1-1/31	9/1-1/31	434	1,899
Squaw Creek Ranch	Up to 3 Weeks 5/1-7/31	Up to 3 Weeks 5/1-7/31	**	55
Lower Squaw Creek Ranch	Up to 3 Weeks 8/1-10/31	Up to 3 Weeks 8/1-10/31	**	100
North of Home	Period of use to be defined on an annual basis	Period of use to be defined on an annual basis	**	116
West Big Springs Allotment				
Independence Valley	11/1-7/14	11/1-7/14	363	1,803
Holborn	7/15-9/14 11/1-11/15	7/15-9/14 11/1-11/15	363	550
North Pequop Mountain	9/15-10/31	9/15-10/31	363	331

¹These figures assume the percent public land remains at 86 percent (East Big Springs Allotment) and 59 percent (West Big Springs Allotment). Livestock numbers may decrease if the public land increases.

² Use in East Pequop Bench Pasture would be rotated as described in the MUD except for the area burned in the 2000 Big Springs fire, which would be deferred to last every year so that livestock do not affect sage grouse strutting grounds located in the southern end of this field.

2.5 Owyhee Allotment

The Owyhee Allotment is approximately 376,270 acres, of which 371,431 acres are public lands (98.7 percent public lands), and is located in the northwest corner of the public lands managed by BLM's Elko Field Office, along the Idaho-Nevada border (**Map 1-1, Appendix A**).

The Wilson Fire Complex burned 42,097 acres of public and private lands within the Owyhee, Petan-Owyhee, and YP Allotments in July of 2005. Following the fire, the Elko Field Office implemented emergency fire rehabilitation and stabilization measures which included:

- native shrubs, perennial grasses, and forbs as part of Watershed Aerial Seeding;
- fence repair and new, temporary fence construction (no new temporary fences were constructed in the Owyhee Allotment); and
- potential for closure of the burned areas within the three allotments to livestock grazing through full force and effect decisions anticipated in May 2006.

The Upper and Lower Fourmile Pastures within the Owyhee Allotment were affected by the

Wilson Fire Complex and have been closed to grazing until rehabilitation objectives are achieved. It is anticipated that these pastures will be closed to livestock grazing in 2006 and possibly 2007. Once the rehabilitation objectives are achieved and the burned area is open to livestock grazing, AUMs would remain reduced until the riparian objectives are met, at which time grazing would resume in the Upper and Lower Fourmile Pastures under the grazing alternative selected as a result of this EIS.

For the purposes of analysis, the effects of the alternatives are assessed as if these two pastures were to be included in the interim and final grazing systems. During the period of the fire closure, these pastures would receive complete rest and the permittee would remove livestock from public lands during the scheduled use periods for these two pastures. Following attainment of the rehabilitation objectives, the two pastures would be available as per the grazing system of the selected alternative.

2.5.1 Alternative I - Re-issue Grazing Permits at Historic Levels

Under this alternative, BLM would continue to implement the existing grazing management strategies. However, the allotment evaluation analysis determined that the No Action Alternative was not achieving some of the Rangeland Health Standards or making significant progress toward some of the allotment objectives, specifically, the riparian objectives for Lower Fourmile Pasture and ecological condition at several key areas. The objectives from the Resource Management Plan, as well as objectives for Key Areas, Wild Horses, Wilderness, and Recreation, and Standards for Rangeland Health, are included in Appendix C. The attainment or non-attainment of the objectives and standards are indicated following the description of the objective or standard. Non-attainment of the objectives was a primary factor in developing an alternative grazing system.

The No Action Alternative grazing system for the Owyhee Allotment is described below.

The active grazing use for the allotment was 30,155 AUMs, but the permittee also had 1,692 AUMs that had been historically suspended. An AMP was developed in 1987, but was not completely implemented until 1990 after the fences necessary to implement the system were constructed (**Map 2-5, Appendix A**). The cross fencing resulted in five native pastures (Star Ridge, Dry Creek, Chimney Creek, and Upper and Lower Fourmile Pastures), and one seeding pasture (Winters Creek Seeding). The AMP implemented a combination of rest-rotation and deferred-rotation system to provide growing season rest in each of the native pastures one - year out of two. The rest-rotation use on both the Star Ridge and Dry Creek pastures outlined in the AMP is from March 1 to August 15. However, in order to reduce the hot season grazing use on the South Fork Owyhee River, the ranch has voluntarily ceased grazing use by June 30, within the Star Ridge Pasture since 1995. Deferred-rotation use on the Lower and Upper Fourmile and Chimney Creek pastures is from March 1 to May 15 and November 15 to January 31 one year and August 16 to October 15 the next year.

Under this alternative, the average actual use between 1981 and 1999 on this allotment was 18,862 AUMs, with a low of 10,247 AUMs and a high of 29,379 AUMs. The average actual use has resulted in less AUMs being used than are provided for in the permit. Short-term and long-term objectives for the uplands are generally being met, with the exception of some wildlife objectives, for which the causal factor has been determined not to be livestock.

Fence modifications and mitigation proposals that were developed as a result of field monitoring would still be viable under this alternative. This includes addition of three-inch wide metal stays to existing fence spans with all t-posts spaced as far as 22 feet apart, and painting the tops of the t-posts within a mile of four sage grouse leks with white enamel paint.

2.5.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Under this alternative, livestock use would be managed in accordance with the Final Multiple Use Decision for the Owyhee Allotment (BLM, 2002c), as amended. In addition, this alternative includes a series of grazing management decisions, short-term key area utilization objectives (see Section 2.5.2.2), specific permit terms and conditions, and other management actions. This alternative includes a final grazing system which would become effective upon completion of essential range improvement projects and monitoring. This alternative also implements grazing use adjustments suggested in the MUD. As a result of the public review of the DEIS, grazing use adjustments would be implemented under a phased approach based on monitoring. This is defined as the interim grazing system.

The initial stocking levels for the interim grazing system would be 23,247 AUMs in year 1 (20,118 in year 2) which is equivalent to the average actual use AUMs during the period 1995 through 2005. The difference between the calculated carrying capacity (i.e., 29,903 AUMs) and the average actual use AUMs (i.e., 23,247 AUMs), or 6,656 AUMs, would be held in temporary suspension until short-term objectives (see Section 2.5.2.2) are met, essential range improvements are constructed, and monitoring shows the ability of the vegetative resource to sustain additional grazing use. The short term key area objectives would also be used to determine the sustainability of existing use and non-attainment of these would result in adjustment of authorized use downward with reduced AUMs going back into temporary suspension. The terms and conditions and short-term key area objectives would apply to both the interim (initial) grazing system and the final grazing system.

2.5.2.1 Grazing Management Decisions

The actions proposed for the Owyhee Allotment include:

1. Vacate the 1987 Allotment Management Plan for the Owyhee Allotment.
2. Establish permitted livestock use within the Allotment as indicated in **Table 2-33**.
3. Implement the rest rotation and deferred grazing system for the Owyhee Allotment as outlined in **Table 2-34** with the following special grazing stipulations:
 - (a) The numbers of livestock to be grazed would remain flexible according to the needs of the permittee. The grazing system would be based on the maximum number of AUMs that may be removed from each pasture. Livestock would be moved in accordance with the dates outlined in the grazing system.
 - (b) Pasture moves may be adjusted by ten days either way based upon the availability of forage and water and/or if short-term key area utilization levels are being approached, with the exception of the Star Ridge Pasture in which grazing use would not extend beyond June 30.
4. To implement the grazing system, the essential range improvement projects listed in **Table 2-35** and displayed on **Map 2-5, Appendix A**, would be constructed. The Fourmile Butte Well and associate 9,000-gallon water storage tank would be located in T. 43 N., R. 49 E. sec. 10, SW¼NE¼. The Fourmile Butte Pipeline would consist of approximately 1.76 miles of pipeline running north of the well and 1.54 miles of pipeline running south of the well. The pipeline would be buried and would be five troughs associated with the pipeline. The South Fork Owyhee Riparian Protection fence would consist of 4.45 miles of fence located approximately one mile west of the South Fork Owyhee River. Other range improvements that would facilitate the grazing system are outlined in Section 2.7.2.2 (Reasonably Foreseeable Future Actions).

Table 2 - 33: Alternative 2 – Final Owyhee Allotment Authorized Use and Period of Use

Allotment	Livestock Number & Kind	Begin Period ¹	End Period ¹	%PL	Type Use	AUMs
Owyhee	3,053 Cattle	2/15	2/28	98	Active	1,377
	3,053 Cattle	3/1	12/15	98	Active	28,526
Total						29,903

¹ Grazing use would be in accordance with the prescribed grazing system which outlines the period of use and AUMs allocated for each pasture.

Table 2 - 34: Alternative 2 – Final Owyhee Allotment Grazing System

Year	Pasture	Livestock Number & Kind	Begin Period	End Period	% Public Land	Type Use	AUMs
1	Star Ridge	2,761 Cattle	2/15	2/28	98	Active	1,245
		2,761 Cattle	3/1	6/30	98	Active	10,856
	Chimney Creek	1,709 Cattle	3/1	5/15 ¹	98	Active	4,184
		1,709 Cattle	10/16	12/15	98	Active	3,359
	Lower Fourmile	1,857 Cattle	7/1	10/15	98	Active	6,403
	Upper Fourmile	181 Cattle	7/1	10/15	98	Active	625
		48 Horses	3/1	12/15	98	Active	444
Winters Creek Seeding	518 Cattle	3/1	5/30	98	Active	1,518	
	518 Cattle	10/1	12/15	98	Active	1,269	
	Dry Creek					Rest	
Total							29,903
2	Dry Creek	1,872 Cattle	2/15	2/28	98	Active	844
		1,872 Cattle	3/1	7/31	98	Active	9,233
	Chimney Creek	3,838 Cattle	8/1	9/30	98	Active	7,543
		1,307 Cattle	3/1	5/15	98	Active	3,201
	Lower Fourmile	1,307 Cattle	10/1	12/15	98	Active	3,202
		255 Cattle	3/1	5/15	98	Active	625
	Upper Fourmile	48 Horses	3/1	12/15	98	Active	444
518 Cattle		3/1	5/30	98	Active	1,518	
Winters Creek Seeding	518 Cattle	10/1	12/15	98	Active	1,269	
	Star Ridge					Rest	
Total							27,879

¹ After May 15, this herd of cattle would be moved onto the Lime Mountain and Cornucopia Allotments then onto private ground in the Columbia Basin.

Table 2 - 35: Range Improvements Essential for Implementation of Final Grazing System for the Owyhee Allotment - Alternative 2

Project	Pasture	Units
South Fourmile Owyhee River Riparian Fence	Lower Fourmile	4 miles
Fourmile Butte Well	Lower Fourmile	1 well
Fourmile Butte Well Pipeline and Troughs	Lower Fourmile	9.5 miles

Permittees would be assigned maintenance of existing range improvement projects. Maintenance of future range improvements would be assigned to the party(ies) deriving primary benefits.

Interim Grazing Plan

Until the essential range improvements are constructed, the interim rest rotation system outlined in **Table 2-36** would be followed.

There are 21 miles of the South Fork Owyhee River in the Star Ridge Pasture and 2.8 public miles of the South Fork Owyhee River in the Lower Fourmile Pasture. The grazing system outlined in the Owyhee MUD is expected to continue to make significant progress towards achievement of riparian objectives within the Star Ridge Pasture. The grazing system outlined in the MUD has also been making progress towards attainment of riparian objectives in the Lower

Fourmile Pasture, albeit at a much slower rate. Consequently, the riparian fence, well, and pipeline were proposed to hasten the progress.

Until these range improvements are constructed, the AUMs in the Lower Fourmile Pasture would be limited to the average actual use from 1995 through 2005. This would also set or limit the amount of AUMs for the rest of the allotment. The suspended AUMs would be reinstated when the riparian fence, well, and pipeline are constructed to exclude livestock from the South Fork Owyhee River, and after one cycle of use at the interim stocking level, if monitoring demonstrate continued achievement of short-term objectives.

Upon achievement of these conditions, the suspended AUMs would be phased in over a three-year period. Results of monitoring would determine whether increase, decrease, or continuation of grazing at existing levels is necessary.

Table 2 - 36: Interim Owyhee Allotment Grazing System – Alternatives 2 and 3

Year	Pasture	Livestock Number & Kind	Begin Period	End Period	Interim AUMs	FMUD Permitted AUMs
1	Star Ridge	2,300 Cattle	3/1	6/30	9,041	12,101
	Lower Fourmile	1,700	7/1	9/20	4,572	6,403
	Upper Fourmile	600	7/1	8/25	1,083	1,069
	Chimney Creek	600	8/26	9/20	503	7,543
		2,300	9/21	11/30	5,261	
	Dry Creek	Rest	Rest	Rest	Rest	Rest
	Winters Creek ¹	variable	Early Spring or Late Fall		2,787	2,787
Total					23,247	29,903
2	Dry Creek	1,150	3/1	5/25	3,186	10,077
		2,150	5/26	7/10	3,186	
	Winters Creek	1,000	3/1	5/25	2,771	2,787
	Chimney Creek	2,150	7/11	9/25	5,334	7,543
	Lower Fourmile	2,150	9/26	11/30	4,572	6,403
	Star Ridge	Rest	Rest	Rest	Rest	Rest
	Upper Fourmile ¹	variable	Early Spring or Late Fall		1,069	1,069
Total					20,118	27,879

¹The Winters Creek Pasture and Upper Fourmile Pasture would act as a “utility pasture” in alternate years to be used as needed. This might involve gathering, branding, weaning, etc. It may also be used as needed if water is limited in other pastures or if utilization objectives are close to being exceeded prior to the off date in other pastures.

If, following an increase in AUMs, the short-term objectives are exceeded, or if short-term objectives are not achieved during the initial grazing cycle and livestock are determined to be the causal factor, use would be reduced equivalent to the change suggested by the carrying capacity calculations for the areas of exceedence.

During each grazing season, as utilization reaches the short-term utilization objective within a Use Area or allotment, livestock would be moved to areas where utilization levels are not approaching objectives, or removed within five days.

An additional term and condition of the permit would allow the permittee the option during the interim grazing period to use variable herd size to use available AUMs as calculated in the FMUD, provided the seasons of scheduled use remain the same. This does not apply to Lower Fourmile Pasture.

Final Grazing Plan

The final grazing plan would be the same pasture rotation and schedules identified in the MUD (**Table 2-34**). Initial stocking levels would remain the same as for the interim system until monitoring demonstrates increases are warranted (i.e., short-term objectives outlined in Section 2.5.2.2 have been achieved).

The South Fourmile Owyhee River Riparian Fence, Fourmile Butte Well, and Fourmile Butte Well Pipeline are the only range improvement essential to implementing the final grazing system. All three range improvements are designed to improve the riparian habitat.

Other range improvements that would facilitate the grazing system are outlined in Section 2.7.2.2 (Reasonably Foreseeable Future Actions).

2.5.2.2 Short-Term Key Area Objectives

The short-term objectives are utilization objectives which apply to both the interim and final grazing systems. The following short-term

Key Area Objectives must be met before any of the voluntary non-use AUMs would be reinstated.

1. Maximum combined utilization by both livestock and wild horses will not exceed 50 percent of current year's growth on key herbaceous species for those pastures within the HMA.
2. Maximum utilization of 50 percent of current year's growth on key herbaceous species by the end of the grazing season within both the Lower and Upper Fourmile Pastures.
3. Maximum utilization of 60 percent of current year's growth on crested wheatgrass within the Winters Creek Seeding Pasture by the end of the grazing season.

The Standards and Guidelines for Rangeland Health, Elko Resource Management Plan Objectives (as amended), and Allotment-Specific Objectives (including Rangeland Program Summary Objectives) are all applicable and detailed in the MUD. These objectives are incorporated by reference. Other Short-Term and Long-Term Key Area Objectives and Riparian Objectives are included in **Appendix C**.

2.5.2.3 Permit Terms and Conditions

Establish terms and conditions as follows:

1. The livestock permittees are expected to move their livestock so as to not exceed established short-term key area objectives.
2. The permittees may at their option, and with consultation with BLM during the interim grazing period, use variable herd size to use available AUMs calculated in the FMUD, provided the seasons of scheduled use remain the same. This does not apply to Lower Fourmile Pasture.
3. Until short-term objectives are met, the difference between the average actual use AUMs and the calculated carrying

capacity AUMs (i.e., 9,647 AUMs) would be held in temporary suspension.

4. The AUMs in temporary suspension would be restored when short-term objectives are achieved in all years of a grazing rotation cycle (i.e., two years). The AUMs would be restored at a rate to be determined by utilization goals and objectives, but not beyond the increases suggested by the FMUD carrying capacity calculations.

If, following the increase in AUMs, the short-term objectives are again exceeded, or if short-term objectives are not achieved during the initial cycle and livestock are determined to be the causal factor, use would be reduced. The reduction would be equivalent to the change suggested by the carrying capacity calculations for the specific key area where objectives are not being met (i.e., the key area utilization values would not be averaged over the entire Use Area or pasture, but would be based on the key area where objective(s) are not being achieved) or other adjustments would be made to resolve the issue.

2.5.2.4 Other Management Actions

The MUD also included actions and decisions with respect to wildlife and wild horses, which are summarized below.

1. Develop additional water developments (guzzlers) for use by wildlife. Consider four sites on Star Ridge Pasture and three sites in the southern portion of the Chimney Creek pasture.
2. Increase forage diversity and herbaceous cover for wildlife and herbaceous forage for livestock by creating a mosaic pattern of vegetation successional stages through vegetative manipulation practices⁵.

3. Identify and prioritize any needed fence project modifications that do not meet BLM specifications starting with the pasture division fence between Upper and Lower Fourmile Pastures.
4. Complete actions to mitigate the effects on wildlife resources due to man-made structures within the allotment. Identify existing BLM range improvements near documented key sage grouse habitat areas and prioritize them for predatory bird-proofing. These actions would include completion of measures on allotment and pasture fence braces and horizontal/vertical corral/guzzler posts, leveling pit reservoir berms (without compromising water holding/catching ability), or relocating corrals through consultation with the permittee. Actions to visually outline projects to minimize collisions where needed, would include painting t-post fence tops white or addition of fence stays to make the fence more visible to sage grouse or other wildlife that travel/fly during periods of low or no light. Complete these actions starting with fence projects and structures near Twelvemile Flat, Silver Lake and Corral Lake leks.
5. Consider relocation of water sources away from Wet Clay Basin 8-10" P.Z. precipitation zone) Ecological Sites on vegetated playas. Existing pit reservoirs on vegetated playas would be allowed to naturally fill in, with no further mechanical improvements to be authorized.
6. Establish two additional upland monitoring sites within the Star Ridge Pasture, one additional monitoring site within the Chimney Creek Pasture and one additional monitoring site (AY-1-02) on Silver Lake within the Dry Creek Pasture.

⁵ This action facilitates attainment of other key area objectives by increasing native perennial herbaceous cover and decreasing shrub foliar cover to 15 percent or less on a key area-specific basis.

7. The AML for the Owyhee HMA is 139 to 231 wild horses. **Table 2-37** identifies how the AUMs for wild horses are allocated within the Owyhee Allotment.
8. Prepare a population management plan to guide the management of wild horses within the Owyhee Herd Area.

Table 2 - 37: Alternative 2 - Owyhee Allotment – Appropriate Management Levels for Wild Horses

Pasture	Season of Use	Wild Horse Numbers	Wild Horse AUMs
Star Ridge	3/1-2/28	75 - 125	900 - 1,496
Dry Creek	3/1-2/28	44 - 73	528 - 876
Chimney Creek	3/1-2/28	20 - 33	240 - 397
	Total	139 - 231	1,668 - 2,769

2.5.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Under this alternative, short-term key area objectives (see Section 2.5.2.2, above), and permit terms and conditions for Alternative 2 would apply. This alternative includes a final grazing system which would become effective upon determination through monitoring that increases in permitted AUMs are appropriate (**Table 2-38**). This alternative would implement grazing use adjustments suggested in the MUD under a phased approach based on monitoring. The same interim grazing system proposed under Alternative 2 would also be applied to Alternative 3, as Alternative 3 also has range improvements that are essential to the final grazing system.

The initial stocking levels for the interim grazing system would be 23,247 AUMs in year 1 (20,118 in year 2) which is equivalent to the average actual use AUMs during the period 1995 through 2005 (**Table 2-36**). The difference between the calculated carrying capacity (i.e., 29,903 AUMs) and the average actual use AUMs (i.e., 23,247 AUMs), or 6,656 AUMs, would be held in

temporary suspension until short-term objectives (see Section 2.5.2.2) are met, essential range improvements are constructed, and monitoring shows the ability of the vegetative resource to sustain additional grazing use. The terms and conditions and short-term key area objectives would apply to both the interim (initial) grazing system and the final grazing system.

Changes in the period of use for the Lower Fourmile, Upper Fourmile, and Star Ridge pasture are necessary to remove hot season grazing use on the South Fork Owyhee River in order to improve existing riparian habitat conditions. This has already been done voluntarily by the permittee within the Star Ridge Pasture since 1995.

Essential projects for implementing this grazing system include Dry Creek Well and pipeline, two pipeline extensions from existing wells in Dry Creek Pasture, and one pipeline extension from the existing Winters Creek Seeding Well.

The proposed grazing system would still consist of a two-pasture rest-rotation system and a two-pasture deferred rotation system in even years and a one-pasture rest rotation and one-pasture deferred rotation in odd years.

Table 2 - 38: Alternative 3 - Final Owyhee Allotment Grazing System

Year	Pasture	Livestock Number & Kind	Begin Period	End Period	% Public Land	Type Use	AUMs	
1	Lower Fourmile	2,600 Cattle	3/1	5/15	98	Active	6,283	
	Upper Fourmile	400 Cattle	3/1	5/15	98	Active	966	
	Chimney Creek	3,000 Cattle	5/16	8/1	98	Active	7,443	
	Dry Creek	3,000 Cattle	8/2	11/1	98	Active	8,796	
		1,000 Cattle	11/2	12/15	98	Active	1,224	
	Winters Creek Seeding	2,000	11/2	12/15	98	Active	2,499	
Star Ridge						Rest		
Total							27,211	
2	Star Ridge	3,000 Cattle	3/1	6/30	98	Active	11,696	
	Dry Creek	3,000 Cattle	7/1	9/30	98	Active	8,892	
	Chimney Creek	2,500 Cattle	10/1	12/15	98	Active	6,041	
	Winters Creek Seeding	500 Cattle	10/1	12/15	98	Active	1,208	
	Upper Fourmile						Rest	
	Lower Fourmile						Rest	
Total							27,837	

2.5.3.1 Grazing Management Decisions

The actions proposed for the Owyhee Allotment under Alternative 3 include:

1. Adopt the following additional term and condition to the Grazing Permit: Livestock permittee would be allowed flexibility during the interim period to use variable herd size to use available AUMs as calculated in the MUD, provided the seasons of scheduled use remain the same. This does not apply to Lower Fourmile Pasture.
2. Implement the rest rotation and deferred grazing system for the Owyhee Allotment as indicated in **Table 2-38**. Riparian pastures Star Ridge, and Lower Fourmile and Upper Fourmile, would receive riparian grazing treatments consisting of cessation of grazing by June 30 and May 15, respectively, combined with complete rest every other year.

3. Dry Creek Pasture would receive growing season deferment every year. One year out of two it would receive use into the winter.
4. Chimney Creek Pasture would receive growing season deferment every other year.
5. Winters Creek Seeding would receive late use (October to December) every year.
6. This alternative would require water developments in order to extend use into the summer, fall, and winter months in the Dry Creek Pasture.

2.5.3.2 Short-Term Key Area Objectives

The short-term objectives are utilization objectives which apply to both the interim and final grazing systems. The short-term Key Area Objectives included in Alternative 2 apply to Alternative 3 and must be met before any of the voluntary non-use AUMs would be reinstated.

2.5.3.3 Permit Terms and Conditions

Establish terms and conditions the same as for Alternative 2.

2.5.3.4 Other Management Actions

Implement actions and decisions with respect to wildlife and wild horses, which are summarized below.

1. Develop additional water developments (guzzlers) for use by wildlife. Consider four sites on Star Ridge Pasture and three sites in the southern portion of the Chimney Creek pasture.
2. Identify and prioritize any needed fence project modifications that do not meet BLM specifications starting with the pasture division fence between Upper and Lower Fourmile Pastures.
3. Complete actions to mitigate the effects on wildlife resources due to man-made structures within the allotment. Identify existing BLM range improvements near documented key sage grouse habitat areas and prioritize them for predatory bird-proofing. These actions would include completion of measures on allotment and pasture fence braces and horizontal/vertical corral/guzzler posts, leveling pit reservoir berms (without compromising water holding/catching ability), or relocating corrals through consultation with the permittee. Actions to visually outline projects to minimize collisions where needed, would include painting t-post fence tops white or addition of fence stays to make the fence more visible to sage grouse or other wildlife that travel/fly during periods of low or no light. Complete these actions starting with fence projects and structures near Twelvemile Flat, Silver Lake and Corral Lake leks.
4. Consider relocation of water sources away from Wet Clay Basin 8-10" p.z. Ecological Sites on vegetated playas. Existing pit reservoirs on vegetated

playas would be allowed to naturally fill in, with no further mechanical improvements to be authorized.

5. Establish two additional upland monitoring sites within the Star Ridge Pasture, one additional monitoring site within the Chimney Creek Pasture and one additional monitoring site (AY-1-02) on Silver Lake within the Dry Creek Pasture.
6. Establish the appropriate management level for wild horses for the Owyhee Allotment and Owyhee Herd Area.
7. Prepare a population management plan to guide the management of wild horses within the Owyhee Herd Area.

Interim Grazing Plan

There are 21 miles of the South Fork Owyhee River in the Star Ridge Pasture and 2.8 public miles of the South Fork Owyhee River in the Lower Fourmile Pasture. The grazing system outlined above for Alternative 3 is expected to continue to make significant progress towards achievement of riparian objectives within the Star Ridge Pasture. In addition, the system should make significant progress toward achievement of riparian objectives within the Lower and Upper Fourmile pastures by changing the season of use to alternating years of early spring use and rest. However, several essential range improvements are necessary in Dry Creek Pasture to implement the final grazing system. Therefore, until these range improvement are installed, the interim grazing plan detailed in **Table 2-36** would be implemented under this alternative. The AUMs would be reinstated when the Dry Creek range improvements are constructed, and after one year of use at the interim stocking level to demonstrate continued achievement of short-term objectives. The AUMs would be reinstated over a three-year period, with monitoring to determine whether an increase, decrease, or continuation of grazing at existing levels is necessary.

If, following the increase in AUMs, the short-term objectives are again exceeded, or if short-term

objectives are not achieved during the initial cycle and livestock are determined to be the causal factor, use would be reduced equivalent to the change suggested by the carrying capacity calculations.

2.5.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, sensitive species habitats were identified for the Owyhee Allotment and livestock use was developed which would mitigate or reduce impacts to their habitats resulting from non-attainment of the Rangeland Health Standards and/or significant progress was not being made, and livestock were determined to be the causal factor. Under this alternative, riparian objectives on the South Fork Owyhee River within the Lower Fourmile and Star Ridge Pastures would be obtained without constructing any range improvements for livestock management.

The following two-pasture, rest-rotation system and two-pasture, deferred-rotation system would be implemented. There would be no interim grazing system (as no time is needed to develop range improvements). Grazing use in riparian pastures would not be scheduled beyond June 30 or May 30, depending on the pasture in combination with rest every other year. Under these systems, complete rest from livestock grazing or the deferment of grazing during the critical growth period of key management plant species would occur.

2.5.4.1 Grazing Management Decisions

1. The actions proposed for the Owyhee Allotment under Alternative 4 include

Implement the rest-rotation and deferred grazing system for the Owyhee Allotment as outlined in **Table 2-39**.

2. Riparian pastures (Star Ridge and Lower Fourmile) receive riparian grazing treatments consisting of cessation of grazing by June 30 and May 30, respectively, combined with complete rest every other year. Upper Fourmile Pasture would receive early winter use alternating with complete rest.
3. Dry Creek Pasture would receive rest every other year with summer use June 1 to July 31 every other year. This pasture would receive the same treatment as outlined in the MUD, but at a 30 percent reduction in cattle numbers.
4. Winters Creek Seeding would receive late use every year. This seeding could also receive spring use instead of late use, if needed (See **Table 2-39** and related footnotes)

2.5.4.2 Short-Term Key Area Objectives

The short-term objectives are utilization objectives. The short-term Key Area Objectives included in Alternative 2 apply to Alternative 4.

2.5.4.3 Permit Terms and Conditions

Establish terms and conditions the same as for Alternative 2.

2.5.4.4 Other Management Actions

Implement actions and decisions with respect to wildlife and wild horses, which are the same as those described under Alternative 2 (Section 2.5.2.2).

Table 2 - 39: Alternative 4 - Owyhee Allotment Grazing System

Year	Pasture	Livestock Number & Kind	Begin Period	End Period	% Public Land	Type Use	AUMs
1	Lower Fourmile	2,200 Cattle	3/1	5/30	98	Active	6,582
	Dry Creek	2,200 Cattle	6/1	7/31	98	Active	4,412
	Chimney Creek	2,200 Cattle	8/1	11/15	98	Active	7,543
	Winters Creek Seeding	2,200 Cattle	11/16	12/15	98	Active	2,169
	Upper Fourmile						Rest
	Star Ridge						Rest
Total							20,706
2	Star Ridge	2,200 Cattle	3/1	6/30	98	Active	8,752
	Chimney Creek	2,200 Cattle	7/1	10/14	98	Active	7,933
	Winters Creek Seeding ¹	2,200 Cattle	10/15	11/15	98	Active	2,224
	Upper Fourmile	2,200 Cattle	11/16	12/15	98	Active	1,157
	Lower Fourmile						Rest
	Dry Creek						Rest
Total							20,066

¹ Consider spring use on Winters Creek Seeding (crested wheatgrass). Dry Creek Pasture livestock use currently dependent on artificial water developments or water hauling. With no new pipelines, consider deferment out of seed ripe by switching dates with Winters Creek Seeding and Chimney Creek during “wet years” (when large capacity of water observed in stock ponds by mid May) per pro-rate of AUMs. If water developments constructed, defer use on Dry Creek until after seed ripe period (est. July 15 to July 31) per pro-rate of AUMs between the three pastures.

2.6 Alternatives Considered but Eliminated from Detailed Analysis

2.6.1 No Grazing

The no grazing alternative would remove livestock from the public lands in identified grazing allotments. This alternative would not be in conformance with the livestock grazing management actions and decisions in the Elko or Wells RMPs. Further, the resource conditions, trends, and management objectives outlined in the Elko and Wells RMP can be reasonably met through the grazing management changes identified in the action alternatives evaluations. Therefore, the no grazing alternative is not considered further in this EIS.

2.6.2 Permit Grazing Based on Drought Conditions with Temporary Non-Renewable Use for Non-Drought Years

Currently the BLM has determined base level AUMs (i.e., carrying capacity) based on normal year production and has the discretionary authority to reduce grazing under drought conditions to protect resources as provided by the Code of Federal Regulations. For example, several allotments in the Sheep Allotment Complex were closed to grazing in 2003 based on BLM monitoring and prevailing drought conditions. These areas have not yet been re-opened, despite abundant rainfall in 2005, to allow for continued recovery from the lingering effects of drought.

This alternative would determine the carrying capacity based on productivity of the range sites during drought years. During non-drought years, the BLM would have discretion to increase the active AUMs through temporary non-renewable use permits, provided this use is consistent with multiple-use objectives.

Because the alternative system does not provide any real alternative to resource protection, this alternative is not considered further in the EIS. In addition, this alternative would impose a substantial and unnecessary workload on the BLM to implement a major grazing system through Temporary Non-Renewable authorization.

2.6.3 Restore Non-Native Vegetation to Native Vegetation

Each of the subject allotments has seedings of non-native vegetation (crested wheatgrass), and/or areas of non-native annual grasses (cheat grass) which has established on burned or disturbed areas. One potential alternative suggested by the public was restoration of native vegetation to these sites.

BLM can address this issue during the allotment evaluation process, identify vegetation management as mitigation for any of the alternatives being considered, or propose and implement this action as a result of management decisions. Therefore, there is no need to develop this into a separate alternative, and this alternative is not considered further in the EIS.

2.6.4 Change Type of Livestock from Sheep to Cattle (Sheep Allotment Complex)

The public also identified changing the type of livestock on the Sheep Allotment Complex from sheep to cattle as an alternative to be considered. Sheep are primarily browsers in the winter and use a wide variety of shrubs. In contrast, cows are more limited in the shrubs that they use. The white sage would receive extensive use under this alternative. Due to the lack of water

distribution, winter use by cattle would concentrate near the few water sources in these allotments, which is not the case with winter sheep use.

Also, due to the lack of forage shrubs for cows, the number of AUMs would be greatly reduced to accommodate a conversion from sheep to cows.

In addition, sheep are generally tended by a herder to maintain the sheep in the areas authorized for grazing. The habit of cows to drift would require additional fences to create pastures, rather than Use Areas, and fences to keep cows out of the residential areas near West Wendover. Additional wells and pipelines would be required if the conversion to cows is conducted.

Although there is a desire on the part of NDOW to reintroduce bighorn sheep into the Goshutes, this is currently not feasible because of disease transmission from domestic sheep to bighorn sheep. This reintroduction could not occur until domestic sheep are removed.

The conversion of the grazing permits from sheep to cattle is not considered further in the EIS.

2.6.5 Limit Grazing Levels to Below Average Actual Use

The allotment evaluations indicated that many of the short-term objectives were being met, or significant progress was being made toward attainment of objective under the “No Action Alternative.” However, the objectives that were not being met were largely due to distribution, not a shortage of forage (i.e., AUMS). Therefore, because the ten-year average actual use was below the calculated carrying capacity and the grazing systems in the alternatives that have been analyzed were all developed to address the specific problems on each allotment that resulted in non-attainment of short-term objectives or Rangeland Health Standards, the BLM determined that reductions in grazing levels below the ten-year average actual use were not warranted. Further, the incorporation of interim grazing systems for the Sheep Complex and Owyhee Allotments, and the adjustment of the

interim grazing system for Big Springs provide a means to carefully evaluate existing grazing use on a year by year basis. The increased capability to make further adjustments to livestock use up or down eliminates the need to consider this alternative further.

2.7 Past, Present, and Reasonably Foreseeable Future Actions

All of the allotments have been subject to historic grazing. Historic grazing of northern Nevada began in the 1860s and soon expanded in an unconfined, uncontrolled manner. Very little supplemental winter feed (hay) was harvested, and livestock depended on the open range for year-long forage (Young et al. 1979). By the early 1900s, the forest preserves were established, which were precursors to the national forests. As these forest preserves were established, restrictions were placed over the nomadic sheep operations.

Grazing continued at high levels into the 1900s until the passing of the Taylor Grazing Act in 1934. The Grazing Service (later to become the BLM) was directed to manage rangelands as a national resource. The BLM established grazing districts and allotments, and began implementation of range improvement projects.

Grazing, range improvement projects, and introductions of non-native, invasive species combined to alter the fire ecology of Great Basin rangelands.

2.7.1 Sheep Allotment Complex

2.7.1.1 Past and Present Actions

Past actions within the Sheep Allotment Complex include historic grazing, implementation of range improvements, change in fire ecology due to fire suppression, plant dynamics, and past grazing authorizations, operation of the railroad, military flyovers, and the development of Interstate 80 and Alternate Route 93.

The Sheep Allotment Complex has historically been used for livestock grazing. Water developments are scattered throughout the allotments, and are functioning at various levels of effectiveness. There are also numerous two-track roads, some associated with the grazing and water developments, and some associated with recreation.

The construction and operation of the railroad has also contributed to the current landscape. The Union Pacific railway currently extends through the north east portion of the Leppy Hills Allotment. Similarly, Interstate 80 and Alternate Route 93 traverse or border all of the allotments except Sugarloaf, Ferber Flat, and Utah/Nevada South allotments. In addition to fragmenting habitat, the transportation corridors have been a pathway for invasive, non-native species and an ignition source of range fires.

Livestock grazing, dispersed recreation, wildlife habitat, wild horses, and scientific study at the Hawkwatch International migration monitoring station are the major present land uses in the subject allotments. In addition, BLM has permitted and continues to permit a wide range of organized recreational events, including motocross races, within the allotments.

Present actions include livestock grazing, OHV recreational events, military flyovers, wildland fires, dispersed recreation, public land sales (under the Baca bill), and the Wendover Landfill.

2.7.1.2 Reasonably Foreseeable Future Actions

The BLM would continue to authorize livestock grazing on the Sheep Allotment Complex and the range improvements proposed in the MUD that would facilitate this action. The BLM would also continue to suppress wild fires and would continue to implement rehabilitation measures to facilitate the recovery of burned areas. Wild horse numbers would be monitored and evaluated with respect to the AMLs and range condition.

The nearness of the Sheep Allotment Complex to West Wendover, Nevada increases the likelihood that the allotments within this complex would

receive additional use for recreation as the population of West Wendover increases. This would include hunting, hiking, camping, and OHV use. Due to the checkerboard land status, there is also potential for ranchettes or subdevelopments to occur in the Leppy Hills and Utah/Nevada North allotments.

Nevada Department of Transportation may fence the right-of-way along Alternate Highway 93 in the southern portion of the Sheep Allotment Complex.

BLM may continue to authorize OHV events in the Sheep Allotment Complex, which could increase the popularity and use of this area by the public.

Mining exploration would continue and mineral development may increase within the Sheep Allotment Complex.

The private land near West Wendover and adjacent to Interstate 80 could be purchased and the grazing leases terminated. In addition, the public land in isolated parcels and parcels near West Wendover have been identified in the RMP as lands suitable for disposal. Therefore, land exchanges and Baca land sales involving these parcels could occur.

2.7.2 Big Springs Allotment

2.7.2.1 Past and Present Actions

Past actions within the Big Springs Allotment include historic grazing, implementation of range improvements and vegetation treatments, change in fire ecology due to fire suppression, plant dynamics, and past grazing authorizations, operation of the railroad, and the development of Interstate 80.

The construction and operation of the railroad and other transportation corridors (e.g., I-80, Montello Highway, old US 40, exploration roads, etc.) have also contributed to the current landscape. The Union Pacific railway currently extends through Goshute Valley and portions of Independence Valley adjacent to the allotment. I-80 extends in a general east-west direction through the northern portions of the allotments,

and numerous roads exist within the allotments. In addition to fragmenting habitat, these transportation corridors have been a pathway for invasive, non-native species and an ignition source of range fires.

Livestock grazing, dispersed recreation, wildlife habitat, wild horses, and scientific study at the Hawkwatch International migration monitoring station are the major present land uses in the subject allotments.

2.7.2.2 Reasonably Foreseeable Future Actions

The BLM would continue to authorize livestock grazing on the Big Springs allotments. Development of additional range improvements to address resource goals would also be expected to continue. At the current time, there are several projects identified in the FMUD which may be developed. **Table 2-40** summarizes these reasonably foreseeable future projects and the projects are described below (see **Map 2-4**). Projects would be considered on a case-by-case basis as the need for the project is determined by monitoring data/analysis. The projects would be developed to address specific resource issues, and each would undergo appropriate NEPA analysis at the time the need for the project is identified.

Table 2 - 40: Range Improvements for Facilitating the Final Grazing System in the West Big Springs Allotment – Alternatives 2 and 3.

Project	Units
Independence Valley Well	1 ea
Independence Valley Seeding	4,000 ac
Holborn Seeding	1,000 ac
North Pequop Mountain Well	1 ea
Pequop Mountain Bench Well	1 ea
Pequop Well Storage Tank	1 ea
Warm Springs Ranch Drift Fence	To be determined

The Independence Valley Well and Independence Valley Seeding are reasonably foreseeable for the Independence Valley Pasture.

The well would be located between Interstate 80 and the existing Johnson Well. The seeding would be associated with existing and reasonably foreseeable water locations. The seed mix would include forage grasses, shrubs, semi-shrubs, and forbs. The areas to be seeded would be the lower bench and valley big sagebrush and rabbitbrush areas that lack adequate grasses and forbs. The acreage of seeding would not be one large block, but several small seedings, with locations to be determined by field inspections.

In addition, the Hogan Spring/seep area on the west bench of the Pequop Mountains would be monitored to determine if a spring development and enclosure should be developed as protection of the water source from wild horses and/or livestock. The Warm Springs Ranch Drift Fence would also be considered for this pasture to prevent livestock from drifting back to the Warm Springs Ranch area.

Within the Holborn Pasture, approximately 1,000 acres of seeding would be considered to restore productivity in the area of the Nevada Department of Transportation (NDOT) well. The seed mix would include forage grasses, shrubs, semi-shrubs, and forbs. The areas to be seeded would be in big sagebrush vegetation.

Within the North Pequop Mountain Pasture several water developments would be considered. The water wells and developments would be located:

- on the north Pequop Mountain bench, approximately two miles west of Pequop Spring (North Pequop Mountain Well);
- on the north Pequop Mountain bench, approximately two miles east of Pequop Spring (Pequop Mountain Bench well)⁶; and
- at the Pequop Well (water storage tank and/or repair of the reservoir).

In addition, the existing and reasonably foreseeable water developments within this pasture would be evaluated to determine if modification is warranted to encourage riparian vegetation. The existing spring developments were developed by capturing all of the water from the spring source and conveying it to a trough at distance from the spring source, precluding the maintenance of riparian vegetation at or near the spring source.

The final grazing system under Alternatives 2 and 3 for East Big Springs would be facilitated through development of new water sources to expand grazing distribution, new seedings to increase forage and habitat around the water sources, and additional fencing to protect riparian habitat and new seedings (**Table 2-41**) to improve the management of livestock under deferred rotation practices as outlined below.

Within the East Pequop Bench Pasture the North Bench Use Area was created by the fire rehabilitation fence and seeding. Additional range improvements within this pasture could include approximately ¼-mile or less of drift fence near the bottom of Long Canyon, an 8,000-gallon water storage tank to Burnt Well, a reservoir for the vicinity of South Well to catch spring runoff, an 8,000-gallon water storage tank could be added to South Well, a new well could be developed in the lower Hardy Creek area, and four pipeline extensions of approximately 1.5 miles each from the West Wendover water pipeline could be developed to provide water to the new seeding area to the north and native range to the south. Two seedings, one of up to 3,000 acres within the area burned in the Oasis fire within the South Bench Use Area, and one of up to 4,000 acres north of the West Wendover water pipeline, are reasonably foreseeable. The seedings would include shrubs, semi-shrubs, perennial forage grasses, and forbs. In addition, seven miles of fence to encompass the new seeding north of the pipeline are reasonably foreseeable. Once these developments are installed, the East Pequop Bench Pasture, late

⁶ This well would not be operated until July 1 to discourage livestock grazing of sage grouse nesting and brood rearing areas.

Table 2 - 41: Range Improvements for Facilitating the Final Grazing System for the East Big Springs Allotment – Alternatives 2 and 3.

Project	Pasture	Units
East Squaw Creek pasture fence	East Squaw Creek	3 miles
Upper East Squaw Creek pasture fence	East Squaw Creek	1 ½ miles
Long Canyon drift fence	East Pequop Bench	¼ mile
Burnt Well storage tank (8,000 gallons)	East Pequop Bench	1 ea
Oasis seeding	East Pequop Bench	3,000 ac
South Well storage tank (8,000 gallons)	East Pequop Bench	1 ea
South Well Reservoir	East Pequop Bench	1 ea
Lower Hardy Creek Well	East Pequop Bench	1 ea
West Wendover pipeline seeding	East Pequop Bench	4,000 ac
West Wendover seeding fence	East Pequop Bench	7 miles
West Wendover pipeline extensions	East Pequop Bench	4 ea
Six Mile Canyon drift fence	Six Mile Canyon	¼ mile
Enlarge Upper Six Mile Canyon Reservoir	Six Mile Canyon	1 ea
Lower Squaw Creek drift fence	East Squaw Creek	2 ½ miles
East Squaw Creek pasture seeding	East Squaw Creek	1,200 acres
North Squaw Creek pasture pipeline extension	East Squaw Creek	3 miles
Pequop Exit drift fence	North Pequop Mountain	2 miles
East Squaw Creek riparian pasture fence	East Squaw Creek	Approx. 6 miles
Middle Fork East Squaw Creek exclosure	East Squaw Creek	½ mile
East Squaw Creek Spring Complex exclosure	East Squaw Creek	¼ mile
North Fork East Squaw Creek exclosure	East Squaw Creek	1 mile
North Pequop Mountain Well pipeline extension	North Pequop Mountain	2 miles
Squaw Creek Ranch Field boundary fence reconstruction/relocation	Squaw Creek Ranch Field	Approx. 4 miles
Noxious Weed Treatments	As needed	To be determined

summer and fall use is reasonably foreseeable for this pasture.

Within Payne Basin Pasture, the Adele, Milk House, and Upper and Lower Nanny springs could be permanently fenced. In addition, existing spring developments that remove all the water from the spring source would be evaluated to determine if the spring developments warrant modification to encourage the growth of riparian vegetation at the spring sources.

The only reasonably foreseeable new project within the Six Mile Canyon Pasture is a drift fence of approximately ¼-mile at the bottom of the

canyon. However, the two existing reservoirs within the canyon could be repaired and/or enlarged where feasible.

The range improvements to be considered for East Squaw Creek Pasture include a drift fence to separate the South Seeding Use Area from the native range to the north. The fence would extend easterly from the Lower Squaw Creek Field to the fence along the highway to Montello (Route 233), and would be constructed to allow access from either side to the reservoir in Lower Squaw Creek Field. The existing seeding in the southern portion of the pasture would be increased by up

to 1,200 acres. The area would be seeded with desirable perennial grasses and forage kochia.

In the North Pequop Mountain Pasture two miles of drift fence could be constructed from Interstate 80 at Pequop Summit toward the southwest corner of the Squaw Creek Ranch field. Six riparian fences or exclosures are also proposed, some of which have water developments associated with the exclosures. In addition, existing spring developments that remove all the water from the spring source would be evaluated to determine if the spring developments warrant modification to encourage the growth of riparian vegetation at the spring sources. A pipeline extension from the reasonably foreseeable well at the north end of the pasture to a location east of the boundary between the two allotments would be constructed.

Within the Upper Squaw Creek Riparian Pasture a water gap at the lower end of the riparian pasture fence would be considered in the design of the fence to provide water for use in the North Squaw Creek and South Squaw Creek pastures.

No specific range improvements are proposed for the Squaw Creek Ranch Field; however, existing fences would be considered for relocation to create a riparian pasture of width similar to the Upper Riparian Pasture

BLM could also improve forage diversity for antelope through the seeding of grass, shrub, semi-shrub and forb seeds. The areas to be seeded would be associated with the water

developments in the Independence Valley and Holborn Pastures of the West Big Springs Allotment, and the East Pequop Bench and East Squaw Creek Pastures of the East Big Springs Allotment as described under the Livestock Grazing Management section above.

In cooperation with NDOW, BLM could install additional big game guzzlers to provide more water locations and to attract big game to areas little used by livestock. The specific locations for new water guzzlers would be identified at a later date.

Under Alternative 4, the West Wendover Seeding Fence and other seeding protection fences (as needed) could be constructed in addition to the projects identified in **Table 2-42**.

The BLM would also continue to suppress wild fires and would continue to implement rehabilitation measures to facilitate the recovery of burned areas.

The allotment is not far from Wells, Nevada and use of the Big Springs Allotments for recreation in the future would be in response to changes in the population for Wells. Due to the deer migration route through the Pequop Mountains, hunting is already a major recreational use of the area and this would be expected to increase if Wells increases in population. Hunting for sage grouse, chukar, and blue grouse also occurs on portions of the allotments. Private land along the interstate could be developed for ranchettes, commercial opportunities, or subdivisions.

Table 2 - 42: Range Improvements to Facilitate the Grazing Systems for the East and West Big Springs Allotments - Alternative 4

Project	Pasture	Units
<i>East Big Springs Allotment</i>		
Oasis Seeding	East Pequop Bench	3,000 acres
West Wendover Pipeline Seeding	East Pequop Bench	4,000 acres
Long Canyon Drift Fence	East Pequop Bench	¼ miles
Burnt Well Storage Tank	East Pequop Bench	8,000 gallons
South Well Storage Tank (8,000 gallons)	East Pequop Bench	1 ea
South Well Reservoir	East Pequop Bench	1 ea
Lower Hardy Creek Well	East Pequop Bench	1 ea
West Wendover Seeding Fence	East Pequop Bench	7 miles
West Wendover Pipeline Extensions	East Pequop Bench	4 ea
Six Mile Canyon Drift Fence	Six Mile	¼ mile
Enlarge Upper Six Mile Canyon Reservoir	Six Mile	1 ea
Pequop Exit Drift Fence	North Pequop Mountain	2 miles
North Pequop Mountain Well Pipeline Extension	North Pequop Mountain	2 miles
Noxious Weed Treatments	As needed	N/A
<i>West Big Springs Allotment</i>		
Independence Valley Well	Independence Valley	1 ea
Independence Valley Seeding	Independence Valley	4,000 acres
Holborn Seeding	Holborn	1,000 acres
North Pequop Mountain Well	North Pequop Mountain	1 ea
Pequop Mountain Bench Well	North Pequop Mountain	1 ea
Pequop Well Storage Tank	North Pequop Mountain	1 ea
Seeding Protection Fences	As needed	As needed

2.7.3 Owyhee Allotment

2.7.3.1 Past and Present Actions

Past actions within the Owyhee Allotment include historic grazing, implementation of range improvements and vegetation treatments, and change in fire ecology due to fire suppression, plant dynamics, and past grazing authorizations.

The isolated location of the Owyhee Allotment has spared it from many of man's actions. Roads and reservoirs, irrigation, range improvements, and grazing have been the primary actions that have occurred on the allotment. More recently, an increase in off-road recreation, hunting, hiking, camping, and the pursuit of solitude has been noted. Limited mining exploration has also been authorized by the BLM.

BLM is currently taking actions to prevent the spread of unplanned fires, as well as rehabilitate recently burned areas. The Star Ridge Fuels Reduction project (mowing) was completed in September 2005 on 998 acres within the Star Ridge Pasture. In addition, aerial seeding has been conducted on portions of the 2005 Wilson Complex Fire, which included approximately 50,000 acres in the Owyhee Allotment. The burned area within the Owyhee Allotment has been closed to grazing through a full force and effect decision signed in February 2006. Closure is anticipated through at least the 2006, and possibly beyond, depending on how long it takes to achieve the rehabilitation objectives. Upon attaining the fire rehabilitation objectives, the Lower Fourmile and Upper Fourmile pastures would be re-opened to grazing and would follow

the grazing schedule outlined in the various alternatives detailed above.

The Owyhee Greenstrip Mowing Project was completed in 2004 and 2005 on 675 acres within the Dry Creek Pasture.

Seven wildlife water developments (guzzlers) have been completed on the Dry Creek Pasture.

2.7.3.2 Reasonably Foreseeable Future Actions

The BLM would continue to authorize livestock grazing on the Owyhee Allotment and consider the range improvements proposed in the MUD that would facilitate this action (Table 2-43). The BLM would also continue to suppress wild fires, continue to implement projects to address wildfire

threats through fuel hazard reductions, and would continue to implement rehabilitation measures to facilitate the recovery of burned areas. Grazing would be adjusted on fuels management areas and wildfire rehabilitation projects on a case-by-case basis.

The area within the Owyhee Allotments continues to be use for military air flights, primarily from the base in Mountain Home, Idaho.

The BLM may construct a boat launching site on the South Fork Owyhee River to provide boaters (rafts, kayaks, and canoes) better access to the river. This undertaking would also necessitate the improvement of the access road to the boat launching site. This project would likely increase the popularity of the area.

Table 2 - 43: Alternative 2 - Owyhee Allotment - Range Improvements to Facilitate the Grazing System and Provide Wildlife Benefits

Proposed Project	Pasture	Units
Star Ridge Well & pipeline	Star Ridge	1 well 3 miles pipeline
Star Valley Well pipeline extension	Star Ridge	3 miles of pipeline from existing well.
Pipeline extension	Dry Creek	2 miles of pipeline from proposed well located on private land.
Winters Creek seeding Well pipeline extension	Dry Creek	2 miles of pipeline from existing well in Winters Creek Seeding.
Pipeline extension	Dry Creek	2 miles of pipeline from existing well on private land.
Exxon storage tank pipeline extension	Chimney Creek, Winters Creek Seeding	2 miles of pipeline extension from Exxon Storage Tank.
Exxon Well pipeline extension	Chimney Creek, Lower Fourmile	1 mile of pipeline extension from Exxon Well.
Mechanical Shrub Thinning and Seeding with Native Species	Selected Areas on Entire Allotment	Approximately 4,000 acres
Seven Wildlife Water Developments	Star Ridge (4), Chimney Creek (3)	7 each
Fence Modifications to Facilitate Wildlife Movements	Upper and Lower Fourmile	4.5 miles
Mitigate Effects of Existing Fences on Wildlife (Flight Diverters)	Star Ridge, Dry Creek, Winters Creek Seeding	14 miles
Bookkeeper Spring development & enclosure	Dry Creek	2 miles of fence Spring development

2.8 Summary Comparison and BLM's Preferred Alternative

For each of the allotments or allotment complex under consideration, a summary of the potential impacts as determined in the analysis in Chapter 3 is provided below. The tables provide a “side-by-side” comparison of the impacts and the text explains the general impacts. Details of the impacts are described in Chapter 3.

2.8.1 Sheep Allotment Complex

The BLM preferred alternative for the Sheep Allotment Complex is Alternative 2 – Implement the Multiple Use Decision as Modified.

As indicated in Section 3.2.1, continuance of Alternative 1 would not allow BLM to meet the rangeland health standards; therefore, this alternative is for comparison purposes only. Potential long-term impacts to the plant communities and habitat for the subject sensitive species would occur under this alternative (**Table 2-44**). Impacts would be most pronounced for long-eared owl, short-eared owl, and sage grouse due to continued impacts to the riparian vegetation. Sage grouse would also be affected by impacts to the nesting habitat. Non-native species would continue to spread under this alternative, degrading the habitat for all species.

Alternative 2 would improve the overall plant health (shrubs and grasses), improving habitat for the raptor prey species and for sage grouse through changes in grazing management and wild horse numbers. The range improvements would improve riparian habitat, with concomitant benefits to long-eared owl, short-eared owl, and sage grouse. Other raptor species would also benefit by the improved riparian habitat as these areas would attract additional prey species. The range improvements under this alternative could have some impact on sage grouse at riparian areas. Some mortality due to fence collisions is

possible; however, BLM fence construction SOPs would reduce potential impacts and any impacts that do occur may not be measurable as a population level impact. This is likely to be offset by the improved foraging conditions for sage grouse broods at the protected riparian areas. Long-term changes in habitat within the exclosures may reduce the habitat quality for sage grouse. Rank grass growth and establishment of woody vegetation reduce the value of these areas to sage grouse.

Alternative 3 would result in improvement of the upland vegetation, but riparian vegetation would continue to be impacted, but to a lesser extent than Alternative 1. The riparian areas would benefit some due to adjustments in wild horse numbers, but not to the extent of the improvement anticipated for Alternative 2. Similarly impacts from non-native, invasive species at riparian areas would continue at reduced levels. The impacts to riparian areas would impact all the raptors, but especially the long-eared and short-eared owls. Sage grouse summer brood habitat would remain degraded under this alternative. It would require more time for the rangeland health standards for the riparian/spring areas to be met under this alternative.

Alternative 4 would result in improvement in the upland vegetation at least to the extent of the improvement anticipated under Alternative 2 or even greater due to the elimination of the growing season livestock grazing. Benefits to the raptor prey species are likely to be realized. Short-eared owl, long-eared owl, and sage grouse would benefit from improved riparian areas, as would the other raptors, but not to the same extent. The range improvements under this alternative could have some impact on sage grouse at riparian areas. Some mortality due to fence collisions is possible; however, BLM fence construction SOPs would reduce potential impacts and any impacts that do occur may not be measurable as a population level impact. This is likely to be offset by the improved foraging conditions for sage grouse broods at the protected riparian areas.

Table 2 - 44: Sheep Allotment Complex - Comparison of Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Permitted Use (AUMs)	39,061	26,652	26,652	26,652
Initial Stocking Rate	39,061	17,474	17,474	17,474
Change (AUMs)	None	-21,587 or -55%	-21,587 or -55%	-21,627 or -55%
Avg. Actual Use (AUMs)	17,573	n/a	n/a	n/a
Resource				
Vegetation	Long term decline in shrub vigor near concentration areas; long-term impact to grass vigor in spring use areas.	Improved upland shrub and grass health and vigor. Some potential for areas of impact in concentration areas until range improvements are completed.	Improved upland shrub and grass health and vigor. Potential for impact in concentration areas.	Same as Alternative 2.
Non-Native, Invasive Species	High potential for establishment and spread.	Lower potential for establishment and spread in the long-term.	Moderate potential for spread and establishment; impacts due primarily from wild horses.	Same as Alternative 2.
Wetland/Riparian Zones	Long-term degradation of vegetation, primarily attributed to wild horses.	Improvement of riparian vegetation.	Riparian would show modest improvement (wild horse impacts continue).	Same as Alternative 2.
Sensitive Species	Long-term degradation of prey habitat, and nesting habitat, esp. long-eared owl, short-eared owl, and sage grouse, and to a lesser extent, other raptors	Long-term improvement of long-eared and short-eared owl habitats; short-term improvement of sage grouse brood habitat; potential long-term impact to sage grouse brood habitat; improved sage grouse nesting habitat.	Improvement of upland habitats for prey and for sensitive species. Moderate improvement of riparian habitat would reduce benefits to long-eared owl, short-eared owl, and sage grouse, and to a lesser extent, other raptors. Not to the magnitude of Alternative 1.	Same as Alternative 2.
Meet Rangeland Health Standards - Upland	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Riparian	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Habitat	No	Yes	Yes	Yes

2.8.2 Big Springs Allotment

The BLM preferred alternative for the Big Springs Allotment is Alternative 2 – Implement the Multiple Use Decision as Modified.

As indicated in Section 3.2.2, continuance of Alternative 1 would not allow BLM to meet the rangeland health standards; therefore, this alternative is for comparison purposes only. Potential long-term impacts to the plant communities and habitat for the subject sensitive species would occur under this alternative (**Table 2-45**). Impacts to riparian vegetation and sage grouse habitat would occur under this alternative as riparian areas would continue to receive heavy use and water developments would continue to divert most or all of the water from several springs. Under this alternative, the potential would remain high for non-native, invasive species establishment.

Alternative 2 would result in long-term improvement of shrub and grass species. Some short-term impacts may occur, but the rest built into the system between periods of use would allow the shrubs to recover and maintain vigor. Similarly, grasses would demonstrate some short-term impacts, but would receive rest to allow sufficient photosynthesis to maintain plant vigor. Some impacts would continue at the areas of concentrate used (i.e., water developments) as these areas receive heavier use than the rest of the pastures in addition to the mechanical hoof disturbance. These areas would be smaller in size, but more numerous as the new water sources would increase distribution of livestock grazing (decreasing the size of the area of impact in comparison to Alternative 1), but there would be more sites.

The improvement in upland vegetation and riparian areas would decrease the long-term potential for non-native, invasive species establishment. However, the construction of the fences would create short-term potential for these species to establish within the allotment through surface disturbance that creates suitable

seedbeds for non-native, invasive species. The net result would be lower overall potential for non-native, invasive species.

The grazing system and spring exclosures/riparian fencing would improve riparian habitat as these areas would receive rest or protection during hot season grazing. This alternative would improve nesting habitat quality, reduce disturbance at leks, and improve summer brood habitat for sage grouse.

Alternative 3 would achieve the riparian goals without the riparian exclosures/fences and seedings, by creating riparian pastures in which the grazing is designed to benefit the riparian vegetation. The grazing system would result in improved upland grass and shrub vigor by providing sufficient rest between grazing periods in all pastures. The impact to grasses from the sagebrush density combined with the grazing near the water sources cannot be alleviated by only a change in the grazing system.

The potential for non-native, invasive species to establish is less under this alternative than for Alternative 1 and Alternative 2. Fewer acres of surface disturbance would occur due to the elimination of some of the fences. The riparian vegetation would also recover under this alternative, except where wild horses are the causal factor. The grazing system would provide deferred use or rest-rotation in all the pastures with riparian habitats. However, livestock would still have access to the riparian areas and the amount of improvement under this alternative is anticipated to be less than Alternative 2.

Alternative 3 would result in the improvement of some nesting habitat, but without the rehabilitation of the sagebrush in Holborn Pasture, the potential for nesting habitat in this area of degraded sagebrush would not be realized. Lek disturbance would be reduced.

Alternative 4 would result in improvement of the grass and shrub vigor. The rest or deferment of riparian vegetation as well as the upland vegetation, combined with reduced AUMs would

Table 2 - 45: Big Springs Allotment - Comparison of Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Permitted Use (AUMs)	21,983	16,963	15,808	14,509
Initial Stocking Rate	21,983	13,601	13,601	14,509
Change (AUMs)	None	-8,382 or -38%	-8,382 or -38%	-7,474 or -34%
Avg. Actual Use (AUMs)	10,500	n/a	n/a	n/a
Resource				
Vegetation	Long term decline in shrub vigor near concentration areas; long-term decline in grass vigor in spring use areas.	Improved upland shrub and grass health and vigor.	Same as Alternative 2	Same as Alternative 2.
Non-Native, Invasive Species	High potential for establishment and spread.	Lower potential for establishment and spread in the long-term.	Same as Alternative 2	Low to moderate potential for establishment and spread.
Wetland/Riparian Zones	Long-term degradation	Improvement of riparian vegetation.	Improvement of riparian vegetation, but not to extent of Alternative 2.	Improvement of riparian vegetation greater than Alternative 3, but not as great as Alternative 2.
Sensitive Species	Long-term impacts to sage grouse nesting and brood habitat; lek disturbance.	Improvement of sage grouse nesting and brood habitat; reduction of disturbance at leks.	Improvement of sage grouse nesting and some brood habitat; but also potential for impacts to brood habitat and some nesting habitat.	Similar to Alternative 2; less disturbance during breeding, nesting, and brooding periods for sage grouse.
Meet Rangeland Health Standards - Upland	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Riparian	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Habitat	No	Yes	Yes	Yes

provide for lower intensity of use and periods of rest for plants to recover from the effects of herbivory. However, the grazing system repeats itself in several pastures each year, increasing the potential for some selective grazing pressure to alter the species composition in the long-term.

The riparian improvement would be primarily a result of the grazing system. This is anticipated in provide more improvement in riparian vegetation than Alternative 3, but not as much as Alternative 2.

Impacts from non-native, invasive species would be similar to Alternative 3. Sage grouse would benefit from this alternative due to improved nesting habitat and some improvement in summer brood habitat. Alternative 4 would result in the least amount of disturbance during sage grouse breeding, nesting, and brooding activities, compared to the other alternatives.

2.8.3 Owyhee Allotment

The BLM preferred alternative for the Owyhee Allotment is Alternative 2 – Implement the Multiple Use Decision as Modified.

As indicated in Section 3.4.1.2, the upland areas were improving under the existing grazing system (i.e., Alternative 1), but the riparian rangeland health objectives were not being met (**Table 2-46**). Therefore, this alternative is for comparison purposes only. Impacts to sage grouse breeding and nesting activities are likely to occur under this alternative due to the alternating early season use in Star Ridge and Dry Creek pastures where 11 of the 12 documented leks within the allotment are located. The impacts to the riparian vegetation under this alternative reduce the quality of habitat for the long-eared owl, short-eared owl, and sage grouse brood habitat. Habitat for many of the prey species on which the raptors depend would also be degraded under this alternative.

Non-native, invasive species would continue to occupy and spread within the riparian areas under this alternative.

Alternative 2 would address many of the riparian issues, improving brood habitat for sage grouse, and habitat for long-eared and short-eared owls. An increase in prey species and abundance in the riparian areas is also anticipated under this alternative. The use of Star Ridge and Dry Creek pastures would still rotate between rest and use during the breeding/nesting season for sage grouse. Disturbance at the leks could occur under this alternative. Removal of residual grass cover in nesting habitat could also occur.

The range improvements would have an overall benefit to sage grouse, although some mortality due to fence collisions could occur. The proposed wildlife habitat vegetation treatments would open the dense sagebrush canopy and provide for a diversity of forbs and grasses. This is likely to improve habitat for prey species, as well as provide forbs for sage grouse broods. The openings may also be used as leks by sage grouse and nesting areas by burrowing owls, and possibly by short-eared owls.

Construction of the range improvements has potential to increase the distribution of non-native, invasive species under this alternative. However, there would be project stipulations to help control the spread of non-native, invasive species.

Alternative 3 would eliminate the disturbance at leks in Dry Creek Pasture by changing the livestock use to summer and fall or summer use. Star Ridge Pasture would alternate between rest and spring use, continuing the potential to disturb leks and remove nesting residual cover.

Recovery of riparian habitat in Upper and Lower Fourmile pastures and Chimney Creek Pasture would improve sage grouse brood habitat and habitat for long-eared and short-eared owls. Bookkeeper Spring would continue to be impacted by wild horses under this alternative.

The vegetation treatments would not be conducted under this alternative and the improved habitat for sage grouse, burrowing owl, and short-eared owls would not be realized. Similarly, the potential increase in prey species

Table 2 - 46: Owyhee Allotment - Comparison of Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Permitted Use (AUMs)	30,155	29,903	27,837	20,706
Initial Stocking Rate	30,155	23,247	23,247	20,706
Change (AUMs)	None	-6,908 or -23%	-6,908 or -23%	-9,449 or -31%
Avg. Actual Use (AUMs)	18,862	n/a	n/a	n/a
Resource				
Vegetation	Improvement in upland vegetation. Impacts at areas of livestock concentration.	Improved upland shrub and grass health and vigor. Some areas of impact.	Same as Alternative 2.	Same as Alternative 2.
Non-Native, Invasive Species	Moderate potential for establishment and spread.	Lower potential for establishment and spread in the long-term.	Moderate potential for establishment and spread.	Low to moderate potential for establishment and spread.
Wetland/Riparian Zones	Long-term degradation	Improvement of riparian vegetation, except at Bookkeeper Spring.	Same as Alternative 2.	Improvement of riparian vegetation, but over a longer period as compared to Alternatives 2 and 3. Bookkeeper Spring would continue to be impacted by wild horses.
Sensitive Species	Degradation of sage grouse brood habitat; potential impacts to nesting habitat; disturbance at leks. Degradation of habitat for long-eared owl and short-eared owl; degradation of prey habitat for raptors.	Improvement of sage grouse nesting and brood habitat; reduction of disturbance at leks. Improvement of burrowing owl, long-eared owl, and short-eared owl habitat; improvement of raptor prey habitat; continued impacts to sage grouse brood habitat at Bookkeeper Spring.	Improvement of some sage grouse brood habitat; but also potential for impacts to brood habitat; reduction of disturbance at leks. Improvement of long-eared owl and short-eared owl habitat; improvement of raptor prey habitat.	Same as Alternative 2, with additional improvement of sage grouse upland habitat.
Meet Rangeland Health Standards - Upland	Yes	Yes	Yes	Yes
Meet Rangeland Health Standards - Riparian	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Habitat	No	Yes	Yes	Yes

and abundance associated with these treatments would not occur.

Alternative 4 would also result in improvement of the riparian habitat, with concomitant benefits to sage grouse, long-eared owl, and short-eared owl, as well as the prey species for other raptors. The summer use alternating with rest in Dry Creek would eliminate disturbance at leks and provide residual nest cover in this pasture. Impacts to sage grouse (disturbance at leks and removal of

residual nesting cover) would continue in the Star Ridge pasture.

The proposed vegetation treatments would open the dense sagebrush canopy and provide for a diversity of forbs and grasses. This is likely to improve habitat for prey species, as well as provide forbs for sage grouse broods. The openings may also be used as leks by sage grouse and nesting areas by burrowing owls, and possibly by short-eared owls. This is likely to improve habitat for prey species.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter provides a description of the existing condition of the environment (i.e., affected environment) as the basis for determining potential impacts (i.e., environmental consequences) from the implementation of the Alternatives. The baseline information was obtained from the allotment evaluations and BLM and NDOW files and includes the Sheep Allotment Complex (**Map 3-1**), Big Springs Allotment (**Map 3-2**), and Owyhee Allotment (**Map 3-3**). The geographic area considered for analysis was based on previous NEPA analysis and the scoping process. For each of the resources analyzed, the area of affected environment was defined by the area of potential environmental impacts due to the alternatives. This was generally considered the area within the allotment boundaries.

Information used to assess rangeland health conditions in assessing the impacts of the alternatives includes monitoring data from the allotment evaluation, historic and recent livestock use reports, and surveys of streams, riparian areas and seeps and springs. In addition to data available at the Elko Field Office from surveys for the sensitive species, information from the NDOW and the Nevada Natural Heritage database and resulting from literature searches was used. BLM also used information and scientific literature received during the public scoping period for this EIS (from December 14, 2004 to January 18, 2005), and as a result of public and agency review of the Draft EIS (December 9, 2005 to January 24, 2006).

With respect to the significant issues analyzed, and in accordance with regulations to implement NEPA (40 CFR 1502.22), information that BLM determined is essential to a reasoned choice among alternatives is included. Where information is lacking, and costs of collecting additional information were exorbitant or the means to obtain it are unknown, the analysis of the issue provides: (1) identification that such information is incomplete or unavailable; (2) the relevance of the information to evaluating reasonably foreseeable adverse impacts; (3) a summary of existing credible scientific evidence which is relevant to evaluating adverse impact; and/or (4) an evaluation of such impacts based on theoretical approaches or research methods generally accepted in the scientific community.

A related issue raised by comments on the Draft EIS was in reference to the sufficiency of the analysis. This Final EIS includes more analysis when BLM determined it would contribute substantially to the public's understanding or environmental impacts and/or acceptance of the proposed action or alternatives. The consideration of more information and analysis in this Final EIS resulted in modifications to the proposed action and monitoring requirements aimed at reducing the potential for adverse impacts of livestock grazing.

For each resource, the management framework governing the resource use, protection, or management has been provided in **Appendix B**. These laws, regulations, and policies set the limits for impacts or set the conditions under which certain activities may take place. The context of these laws, regulations, and policies guide the analysis.

The analysis of impacts assumes that the environmental protection measures or standard operating procedures described in Chapter 2 that are common to all alternatives (Section 2.2) would be implemented. These measures were included in the alternatives in order to reduce potential impacts or to comply with laws or stipulations of permits or land use plans. The impacts are generally described as direct (i.e., caused by the action and occur at the same time

and place), or indirect (i.e., caused by the action and are later in time and farther removed in distance, but are still reasonably foreseeable). Impacts characterized as short-term generally would occur over one grazing cycle, and long-term impacts would occur over several grazing cycles. Where adverse impacts have been identified, mitigation measures are recommended. These measures are not part of the alternatives, but may be committed to by the BLM when issuing its decision to implement the selected alternative. Residual impacts are those impacts that would remain following implementation of the mitigation measures.

An analysis of cumulative impacts concludes the analysis of existing conditions and effects of the alternatives for the Sheep Allotment Complex, Big Springs, and Owyhee allotments.

3.1.1 Setting

The sensitive species designation is normally used for species that occur on BLM-administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. BLM policy is to ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed as threatened or endangered under the Endangered Species Act. Greater sage grouse occur throughout the Elko District, and are known to use habitat found in the Sheep Complex Allotments, Big Springs Allotment and Owyhee Allotment. The BLM-sensitive raptors that are also the focus of this EIS are included in **Table 3-1**.

Table 3 - 1: BLM-Sensitive Raptors in the Sheep Allotment Complex and Owyhee Allotment

Status ¹	Species	Scientific Name	EIS Analysis Notes
S, P	Golden Eagle	<i>Aquila chrysaetos</i>	Sheep Complex, Owyhee
S, P	Northern Goshawk	<i>Accipiter gentilis</i>	Sheep Complex, Owyhee
S, P	Swainson’s Hawk	<i>Buteo swainsoni</i>	Sheep Complex, Owyhee
S, P	Ferruginous Hawk	<i>Buteo regalis</i>	Sheep Complex, Owyhee
S, E, P	American Peregrine Falcon	<i>Falco peregrinus</i>	Sheep Complex, Owyhee
S, P	Prairie Falcon	<i>Falco mexicanus</i>	Sheep Complex, Owyhee
S, P	Long-eared Owl	<i>Asio otus</i>	Sheep Complex, Owyhee
S, P	Short-eared Owl	<i>Asio flammeus</i>	Sheep Complex, Owyhee
S, P	Burrowing Owl	<i>Athene cunicularia</i>	Sheep Complex, Owyhee
S, P	Flammulated Owl	<i>Otus flammeolus</i>	Sheep Complex

¹Status Codes:

E = State Endangered (NAC 503.050)

S = BLM-Sensitive and/or NDOW-Sensitive (NAC 503.050)

P = State Priority (NDOW, Nevada Comprehensive Wildlife Conservation Strategy, 2005; Nevada Bird Conservation Plan, 1999)

Source: NDOW 2005; BLM Information Bulletin NV-2003-097

3.1.1.1 Sheep Allotment Complex

The Sheep Allotment Complex consists of nine allotments located in southeastern Elko County (**Map 3-1**). The Sheep Allotment Complex is non-contiguous, with Boone Springs Allotment

discontinuous from the other allotments in the complex. The crest of the Goshute Mountains forms the area’s western boundary, while the eastern boundary is the Utah state line and the Kingsley Mountains. The southern boundary of the complex area is the Elko/White Pine county

lines, and the northern boundary is Interstate 80 and the Dolly Varden Mountains. Elevations within the complex range from 4,300 feet near Wendover, to approximately 9,610 feet on top of the Goshute Mountains. Large portions of the Antelope Valley and Goshute HMAs are in the complex, and managed to sustain viable wild horse populations. The Bluebell and Goshute Peak WSAs are also located in the higher elevations of the complex. The Salt Lake ACEC, as delineated in the Wells RMP, was identified as historical peregrine falcon use area which supported a population of nesting falcons up until 1960.

3.1.1.2 Big Springs Allotment

The Big Springs Allotment is bounded on the east by the crest of the Toano/Goshute Mountains and on the west by the crest of the Wood Hills (**Map 2-3**). The Pequop Mountains run north-south through the middle of the allotment. This allotment encompasses the northern portions of the Independence and Steptoe/Goshute valleys, and spans 39 miles north-to-south, and 30 miles east-to-west. The West and East Big Springs allotments vary in elevation from 5,582 feet in northern Steptoe Valley to 9,249 feet atop the South Pequop Mountains. The Bluebell WSA and portions of the Spruce-Pequop HMA are located in the West and East Big Springs allotments.

There are five wells and springs that are the municipal water sources for the city of West Wendover, Nevada. A Source Water Protection Zone has been designated to include the water sources associated with the Big Springs Ranch and the well heads south of the Shafter interchange of Interstate 80. Each water source has a delineated water quality protection zone on public lands. Several large springs occur within the allotment on private lands.

3.1.1.3 Owyhee Allotment

The South Fork Owyhee River forms the northwestern boundary of the Owyhee Allotment. The remaining boundaries are established by allotment boundary fences. The allotment is divided into four native pastures and one seeded pasture. Private lands associated with Fourmile

and Winters creeks are fenced separately from the public lands in the allotment.

The allotment is characterized by a high rolling plateau underlain by basalt flows which are occasionally cut by deep, vertically walled canyons. Elevation ranges from 5,100 to 5,600 feet. There are two WSAs within the allotment: the Owyhee Canyon and South Fork Owyhee WSAs.

3.1.2 Critical Elements Not Present, Not Affected, or Previously Analyzed

Prior to issuing the three MUDs, all critical elements of the human environment were evaluated to determine if significant impacts would result from the implementation of the MUDs, such that preparation of an EIS would be required. During this review, several of the critical elements of the human environment were determined not to be present or affected. The remaining elements were carried forward in the analyses.

3.1.2.1 Critical Elements Not Present or Not Affected

As a result of reviews for each of the MUDs (Alternative 2), BLM specialists determined that the following critical elements are not present or would not be affected:

- Air Quality;
- Farm Lands (Prime or Unique)
- Environmental Justice
- Hazardous or Solid Wastes
- Floodplains.

Because Alternatives 3 and 4, analyzed in this EIS for the Sheep Complex, Owyhee and Big Springs Allotments, contemplate the same types of actions in the same geographic areas, as were considered in the original FMUD analyses, these critical elements continue to not be present or not be affected.

3.1.2.2 Critical Elements Previously Analyzed

This EIS tiers to analyses from the EISs for the Elko and Wells RMPs, and more specific analyses from the environmental assessments for the Big Springs MUD ((BLM/EK/PL-2002/029) and the Owyhee MUD (BLM/EK/PL-2002/001) are incorporated by reference. Because Judge McKibben in his August 2004 order did not vacate the FMUDs, nor instruct the BLM to conduct a completely new analysis of livestock grazing impacts on all critical elements and resource issues, opting instead to order additional analysis only for the sensitive bird species and their habitat in specific areas, it can be concluded that the analysis made for Sheep Allotment Complex through the Determination of NEPA Adequacy instrument, and for the Big Springs and Owyhee allotments through the environmental assessments, was valid for all other critical elements insofar as their consideration of the No Action Alternative (currently Alternative 1 in this EIS) and the FMUD alternative (currently Alternative 2 of this EIS), but without the interim grazing systems for Sheep Complex and Owyhee allotments, and without the site-specific project proposals for any of the allotments.

With the addition of the interim grazing systems, Alternative 2 as currently proposed in this EIS represents a more conservative approach to livestock use than contemplated in the FMUDs. The interim grazing system establishes regular discrete results-based assessments of past and present performance and uses these assessments to determine future levels of use. The potential for impacts to any critical element is thereby reduced over that identified for the FMUD systems without interim grazing systems.

Site-specific project proposals were not included as part of the grazing plan analyzed in the original environmental analyses for the MUDs. Inclusion of these proposals in the alternatives for this EIS could, therefore, represent a potential change in impacts over those previously identified. The adoption of SOPs for project design and implementation offsets this potential, and in many cases, eliminates the potential for impact

altogether. In summary, the impacts of the MUDS on critical elements of the human environment, as disclosed in previous analyses, are still valid. The impacts of implementing Alternative 2 as described in this EIS are similar or less than the impacts to the critical elements that would result from implementing the FMUDs.

The components of Alternatives 3 and 4 were not specifically analyzed. However, the fundamental composition, and approach of these two alternatives is the same as for Alternative 2. The intensity of impacts, or risks of adverse impacts to critical elements, is incrementally less for Alternatives 3 and 4 as compared to Alternative 2. For example, Alternative 3, in general has lower levels of grazing use, shorter seasons of use, more deferred use, more rest, and/or fewer numbers or types of projects proposed that would result in adverse impacts to critical elements. Similarly, Alternative 4 has lower levels of grazing use, shorter seasons of use, and/or fewer numbers or types of projects proposed than Alternative 3. Therefore, the analysis conducted in the referenced environmental assessments would be expected to be comparable to or to overestimate levels of impacts for Alternatives 3 and 4.

While the proposed action and alternatives in the FMUD for the Sheep Allotment Complex were not analyzed with an environmental assessment, the proposed actions were compared to those in the Wells RMP EIS and a determination was made that the actions proposed were the same as or similar to those analyzed in the RMP EIS. It was concluded that the existing analysis in the EIS accurately represented the impacts scope and intensity. As mentioned earlier, Judge McKibben in his August 2004 order did not vacate the FMUDs, nor instruct a completely new analysis, opting instead to order additional analysis only in specific areas. Therefore, it can be concluded that the analysis made for Sheep Complex Allotments, was valid for all other critical elements affected.

There are also similarities between the livestock grazing proposals for the Sheep Complex Allotments and those for the Big Springs and

Owyhee allotments which allow the application of these impacts assessments to Sheep Complex Allotments to further support the Determination of NEPA Adequacy. For example, all three allotments and all alternatives propose a controlled approach to livestock use with results based assessments of past and current performance which are used to determine future levels of use. Alternatives for all three allotments take the same approach to livestock use with Alternative 3 being somewhat more conservative than Alternative 2, and Alternative 4 being somewhat more conservative than Alternative 3. Livestock grazing proposals for all three allotments propose to establish specific time and timing restrictions.

There are also other similarities. These similarities allow for the reasonable conclusion that the impacts identified for Big Springs and Owyhee grazing systems in their respective environmental assessments, as well as the conclusion that comparatively similar or less impacts would occur for Alternatives 3 and 4, are the same for the Sheep Complex Allotments.

As part of allotment evaluation and MUD process, BLM reviewed critical elements that could be affected by the proposed grazing and other management decisions as described by Alternative 2 in this EIS, and concluded that no significant impact would result. Therefore, impacts to cultural resources, Native American religious concerns, migratory birds, threatened or endangered species, and water quality (drinking and ground) were not considered as significant issues for detailed analysis in this EIS.

The following summarizes the previous analysis for Alternatives 1 and 2, and also discusses the impacts associated with the new Alternatives 3 and 4 as they are described in Chapter 2.

Cultural Resources

Changes to grazing patterns from use permitted under alternatives 1 and 2, are not anticipated to create any additional disturbance to cultural resources beyond levels that have occurred from historic grazing throughout the allotments.

Impacts to significant cultural resources may occur as a result of implementing projects proposed under Alternative 2 that lead to earth-disturbing activities, such as seedings, fence construction, and livestock, wildlife and wild horse water developments. As a standard operating procedure, BLM completes cultural resource surveys as projects are designed (See Appendix B). Significant cultural resources are either avoided or mitigated. Mitigation measures agreed in consultation with the State Historic Preservation Officer (SHPO), under procedures detailed under Section 106 of the National Historic Preservation Act, BLM's 4th edition of "Cultural Resources Inventory General Guidelines" of 1989 and the State Protocol Agreement between the Nevada BLM and the SHPO. Thus, projects proposed by the MUDs as part of Alternative 2 in this EIS are not expected to result in significant adverse impacts to cultural resources.

Inventories have been completed for some of the range improvement projects that are considered essential to implement each of the Alternative 2 MUDs. No eligible sites were recorded. If construction of these projects is pursued in the future, then the BLM will compare the current proposal to the previous inventory. If additional inventory is deemed warranted and any eligible sites are located, then the project would be designed to avoid any adverse impact to the site.

- In the Sheep Allotment Complex, Boone Springs Allotment, a cultural resources inventory was completed in 2001 for the proposed Perkins Spring Enclosure (BLM1-2116(P)).
- In the North Pequop Pasture of the West and East Big Springs allotments, a cultural resources inventory was completed in 1993 for the proposed boundary fence between Pequop Summit and Rocky Point (report BLM1-1371(P)).
- In the Owyhee Allotment, a cultural resources inventory was completed in 2004 for the proposed Four Mile Butte pipeline, well, and fence (BLM1-2414(P)).

Because alternatives 3 and 4 involve construction of the same, fewer, or no ground disturbing activities on the Sheep Allotment Complex and Big Springs allotments, the likelihood of their adversely affecting a significant cultural resource is less than Alternative 2. For the Owyhee Allotment, Alternative 3 would have more ground disturbing activity, and therefore, more potential for adverse impacts to cultural resources than Alternative 2

importance, as is improvement in the condition of upland habitat of importance to Native Americans.

Native American Religious Concerns

The Elko District is located within the traditional territory of the Western Shoshone, and contains spiritual, traditional and cultural resources, sites, and social practices that aid in maintaining and strengthening social, cultural, and spiritual integrity of importance to tribes. Tribes have expressed interest in commenting on specific project proposals and BLM would initiate consultation as projects are planned. BLM, through informal or early communication and coordination, has identified to the Tribes the schedule for the allotment evaluations each year. BLM is aware of the importance of water sources and the sensitive bird species to traditional life ways. Water sources and animals are considered the “life blood of the Earth and all who dwell upon it;” and those animal species associated with creation stories, spiritual guidance, healing (medicine), and cultural affiliation are of concern. Avian species such as owls, eagles and other raptors, and sage grouse have been recognized by not only the Western Shoshone, but many other tribes across the United States as being sacred animals and a vital component in the maintenance of traditional beliefs and spiritual integrity. The proposed changes to grazing management under each of the action alternatives are generally expected to lead to healthier habitat for sage grouse raptors, and so will likely be beneficial to Native American traditional life ways. If the water developments proposed by Alternative 2 are not constructed under Alternatives 3 or 4, less protection of water sources would be expected. Any improvement in the condition of water sources may benefit tribal use of sites of cultural, traditional, spiritual

Migratory Birds

The environmental assessment for the Big Springs and Owyhee MUDs included a listing of the migratory bird species associated with each of the ecotypes from the 1999 Nevada Partners in Flight Bird Conservation Plan, along with an analysis of impacts associated with the No Action and Proposed Action alternatives (i.e., Alternatives 1 and 2). They conclude that impacts to migratory birds are expected to be minimal. Making progress towards meeting the rangeland health standards is expected to improve habitat used by migratory birds, and thus promote conservation of the species of concern consistent with the Migratory Bird Executive Order. To the extent that projects proposed under Alternatives 2, 3, and 4 include incorporation of design features detailed in the SOPs (Appendix B) to mitigate adverse effects as well as measures to conserve the sensitive bird species, implementation of Alternatives 2, 3, or 4 is not expected to have any measurable effect on migratory bird populations.

Threatened and Endangered Species

The only species listed under the Endangered Species Act that occurs in the allotments is the threatened bald eagle. Bald eagles have been seen throughout northeastern Nevada during the winter months and are an uncommon spring/fall migrant. A large winter roost site occurs within the Sheep Allotment Complex and bald eagles roost in the canyons of the Owyhee Allotment. Continued grazing of livestock under each of the action alternatives is not expected to have any adverse effect on bald eagles. Implementation of the action alternatives is expected to result in improved habitat conditions and increased prey base for bald eagles.

Water Quality Drinking/Ground and Soil

Water quality and soil conditions would improve at the seven springs that would be protected by exclosures in the Sheep Allotment Complex under Alternatives 2 and 4. There would be neither livestock use nor hot season wild horse use of the riparian vegetation associated with

these springs. The lentic areas associated with the springs exclosure projects would become functional which would stabilize soils, making soil particles less susceptible to detachment, reducing erosion. Turbidity and suspended solid levels should decrease, and without trampling and associated soil compaction. Under Alternative 3 (Grazing without Riparian Exclosures and Vegetation Treatments), impacts would be similar to those that are occurring with the No Action Alternative 1, but not as severe.

In the East Big Springs Allotment, the Source Water Area Protection Zone surrounding the springs for West Wendover is located in the North of Home Pasture. This pasture has historically received variable periods and seasons of livestock use. Water quality at spring and seep areas would be deteriorated from concentrated livestock use. Soil compaction from trampling would occur in the riparian areas which would reduce infiltration and increase runoff. Lack of adequate vegetative cover would expose soils to wind and water erosion. Under Alternative 2, livestock use in the North of Home Pasture would generally be limited to trailing. There may also be some seasonal use of this pasture to accommodate livestock movement when the utilization objectives are met. This would limit livestock use in the watershed above the municipal water source springs for the City of West Wendover. Good watershed condition would help trap sediment and pollutants, allow for proper infiltration rates. Reducing the amount of time that livestock congregate around springs and streams would decrease sedimentation and the amount of fecal coliform in the water. Water quality would also be better protected by the grazing proposed for the North of Home Pasture proposed under Alternatives 3 and 4. Benefits of the riparian exclosures would not occur if they are not constructed under Alternative 3.

All of the existing springs and seeps in the West Big Springs allotment are located on fenced private ground. While the grazing systems analyzed in this EIS and associated range improvements may affect the springs, BLM does

not control what happens at the sources themselves.

In the Owyhee Allotment, improved vegetative cover along the South Fork Owyhee River is expected to result from the proposed changes in grazing proposed by all of the alternatives along the South Fork Owyhee River. The stream temperature standard is not being met currently, and the improvement in stream shading would make progress toward meeting this water quality standard wherever other factors such as the geology and orientation of the river preclude this. Improved vegetative cover along the river would trap more sediment and stabilize stream banks, resulting in improved water quality. Improved vegetative cover along the South Fork Owyhee River would also improve floodplain function by dissipating stream energy, filtering sediment, and maintaining the water table.

Special Management Areas

Impacts to the following special management areas are integrated with the analyses for the significant issues that are analyzed in detail in this chapter. This includes impacts to the following special management areas established by the Wells and Elko RMPs:

- Wilderness Study Areas (as they occur in Sheep Allotment Complex, Big Springs, and Owyhee allotments);
- Wild and Scenic Rivers (in the Owyhee Allotment);
- Salt Lake ACEC (in the Sheep Allotment Complex); and

3.1.2.3 Resources Analyzed in Detail

As per the August 2004 court order, this EIS analyzes to the extent applicable to these sensitive raptors and sage grouse, the impacts of grazing, considering upland habitats, springs, seeps, and riparian areas, and the occurrence of the focus species in the Sheep Allotment Complex, Big Springs, and Owyhee allotments. Therefore, the following resources issues are analyzed in detail in the EIS.

The analyses for the following other elements of the human environment are integrated within the detailed analyses for the significant issues that are analyzed in detail in this chapter:

1. Vegetation resources (including non-native, invasive species);
2. Wetlands and riparian zones; and
3. Avian sensitive species (sage grouse and raptors as specified by the court order).

The alternatives consist of two general actions: grazing management and range improvements. These components were evaluated with respect to the vegetation, non-native, invasive species, wetland/riparian areas, and the subject sensitive species as described below.

3.1.2.3.1 Vegetation–Assessment Methodology

There are three major types of effects to vegetation that have potential to occur from the various alternatives. The first type of effect is that of changes to plant productivity and survival due to herbivory⁷.

The second is the effect of the range improvements on the plants and plant communities. The effect of the range improvements focuses on the physical impact to vegetation from constructing the range improvement, as well as the longer-term potential impact from the establishment of non-native, invasive species, concentration of livestock, and distribution of the grazing effort.

The third effect is the potential for non-native, invasive species to establish and spread as a result of the grazing systems. This is primarily a function of surface disturbance, changes in plant communities, and transportation of seeds.

⁷ Herbivory is the general term for removal of plant material by animals. This can include large grazers/browsers, such as livestock or elk, small mammals, such as rabbits and ground squirrels, and plant eating insects.

Plant Productivity

The effect of herbivory on plants is a function of time, duration, and intensity (Briske and Richard 1995). Time refers to the annual plant life cycle and when herbivory takes place (i.e., during the growing season or during dormancy). Duration is the length of time over which the herbivory occurs. Intensity is a measure of the amount of plant material removed by herbivory and is normally separated by current year's growth and previous years' growth.

Time of Herbivory – Shrubs

Most plants initiate growth in the spring when soil temperatures reach approximately 40° to 42° F (Dietz 1989). Growth is initially fueled by carbohydrates stored within above ground plant parts until leaves are sufficiently developed to conduct photosynthesis. The previous year's growth has buds that develop into leaves as well as terminal and lateral buds that develop into new branches or leaders. As the leaders grow, they produce new leaves and may branch to produce lateral branches. At the end of the growing season, the current year's growth "hardens" as the plant transitions into the dormant⁸ period. The terminal and lateral buds produced during the growing season are the new growing points for the next year. The various woody sagebrush species, bitterbrush, and winterfat are somewhat of an exception to this general growth pattern because these species maintain some leaves throughout the "dormant" period and produce seed and conduct photosynthesis during the late fall and winter when conditions are suitable. The presence of mature leaves in spring provides these species with a competitive advantage over other deciduous shrubs because they are able to rely less on stored reserves and more on photosynthetic products in the winter/spring to initiate new growth. This characteristic also allows

established sagebrush, bitterbrush, and winterfat plants to take advantage of winter moisture.

Herbivory in the spring removes the new growth on a branch, requiring additional energy to re-initiate new growth. The bud elongates from the base, with the bud remaining at the end of the shoot or leader. The removal of the end of the leader removes the bud. Depending on how much of the new growth is removed, some or all of the growing points on the new growth may be removed, thus there may be a delay in the regrowth as the plant must develop new growing points. Removal of the new growth delays or reduces the photosynthetic activity, which then limits the amount of carbohydrates available for root growth.

Herbivory in the summer, during the growing season, also removes current year's growth, but the volume of available current growth is greater than in early spring. By mid to late summer photosynthesis has been ongoing, providing the energy for leader and leaf growth, providing carbohydrates for root growth, and replacing carbohydrate reserves used earlier in the spring. The removal of the current growth during this time period is likely to remove either flowering parts, or new buds, and therefore, have some effect on the overall reproductive capability of the plant.

The plants go into dormancy from late summer through fall (depending on the plant species). Herbivory during late summer, fall, and winter removes the growing points for the coming year, but does not substantially affect the plant energy reserves. As indicated above, the woody sagebrush species are somewhat of an exception to this general pattern. The sagebrush species conduct limited photosynthesis during winter and increase the rate of photosynthetic activity as the temperatures increase in late winter/spring.

Duration and Intensity of Herbivory – Shrubs

Intensity of herbivory is a function of the length of time (duration) a plant is exposed to herbivores, the number of herbivores, and the choices available to the herbivores. The more time herbivores are in an area, the higher the

⁸ There is no real dormant season. During late summer and winter respiration continues, albeit at a greatly reduced rate. However, the respiration during this time uses root reserves and there is no active growth.

probability that a plant is browsed and the higher the probability that the plant receives repeat browsing. Similarly, the more herbivores present over a given period of time increase the probability that a plant is browsed one or more times. The probabilities increase further if the choice of plants is low (i.e., only a few plant species available).

Animal behavior is also a factor in determining intensity of herbivory. Animals that constantly move generally remove less plant material per plant than animals that are sedentary and browse repeatedly on the same plants (Norton and Johnson 1983).

Intensity is measured by the volume or percentage of new leaders browsed and the amount or percentage of the leader removed. The higher the intensity of herbivory, the greater the effect on the plant, in both the short-term and long-term (Billbrough and Richards 1993). As more leaders are removed, and as a higher percentage of each leader is removed, the ability of the plant to generate sufficient photosynthetic product (i.e., carbohydrates) to initiate growth the next year or to promote root growth during the current year, is reduced. The plant's ability to develop growing points for the next year or seed during the current year is also reduced, which results in stress to the plant. The stress is reflected by less vigorous growth and inability to compete with neighboring plants that have not been browsed. High levels of herbivory remove growing points and require the plant to devote more energy to maintenance than to growth, reproduction, or replacing energy reserves.

The below-ground plant biomass must be sufficient to supply the above-ground biomass with energy, nutrients, and water, and the above-ground biomass must be sufficient to provide carbohydrates for root growth and replacement. High intensity herbivory reduces the above-ground biomass, which reduces the amount of photosynthetic product the plant can produce. Root growth is simultaneously reduced, so the plant has access to less soil moisture and soil nutrients than a plant with normal root growth, with concomitant less capacity for photosynthetic

activity. This limits the ability of the plant to take advantage of spring growing conditions, and the above ground productivity is reduced the following spring.

When previous years' branches are removed, no current year's growing points are available, and the plant is required to develop new growing points on the woody branches. The result is fewer and shorter leaders (i.e., less forage), which reduces the plant's ability to compete due to reduced photosynthetic activity and reduced energy reserves.

Time of Herbivory – Grasses

The general growth pattern in perennial grasses is not unlike the growth pattern described for shrubs, except the growing period for grasses is generally shorter than the growth period for shrubs due to moisture limitations in the summer. However, the location of the growth points is different than the location in shrubs. Grasses are also classified as cool season and warm season depending on when they initiate growth and the time of year when they are actively growing. Cool season grasses initiate growth in the spring when soil temperature reaches 40° to 45° F and complete their growth cycle in mid-summer. Cool season grasses have greatly reduced growth or are "dormant" during the hot summer months, which is followed by a period of fall green up or increased respiration (varies among species), when temperatures cool and soil moisture increases. Growth at this time is not always represented by leaf material, but development of new growing points, initial development of tillers (above-ground plant parts), and carbohydrate storage may occur.

Warm season grasses initiate growth when soil temperatures reach 60° to 65° F (Dietz 1989) and are actively growing during the warm summer months. These grasses generally are dormant during the winter, having developed the new growing points by summer's end.

Grasses initiate growth from dormant buds, and as the tillers develop, continue growing from growing points on the tillers (Jewiss 1972). The

growing points are located in the plant crown⁹ close to the ground during early spring and increase in height as the tiller height increases. Herbivory that occurs above the growing point removes biomass and reduces photosynthetic capacity for the short-term (i.e., days). This removal of photosynthetic tissue results in less carbohydrates going to the roots, and carbohydrates from above-ground reserves used for new growth (Briske and Richards 1995). The tiller resumes growth and the carbohydrates produced are used to support additional growth and respiration for above ground parts and roots. Carbohydrates that are produced in excess of the immediate needs for energy are pooled in plant crowns and the root system.

Herbivory below the growing points requires that dormant buds at the plant base be activated to resume growth. The grazed tiller does not regrow, but is replaced by a new tiller, which requires more carbohydrates than is required for tiller regrowth. Dormant bud initiation drains the carbohydrate reserves and result in a longer delay in restoring photosynthesis. This reduces the amount of root growth and root replacement for the plant, which can result in a loss of vigor and reduced root mass, especially when repeated grazing throughout the growing season continuously removes active growing points.

As with the shrubs, reduced root mass results in less growth the following year, which results in even less root mass. In grasses, approximately 30 percent of the root is lost and replaced each year. Stressed plants lose the 30 percent, but do not replace all of the lost root biomass, which decreases the plant's vigor and its ability to produce new growth the following year. Conversely, the greater the root mass and carbohydrate reserves, the greater the number of dormant buds produced and the potential is

greater for more plant above-ground biomass and growth the following growing season.

For cool season grasses, such as bluebunch wheatgrass, the plants are dormant or very slow growing during the late summer. However, during the cool fall weather, these cool season grasses resume plant growth, by resuming tiller growth and/or creating new buds. This fall growth is responsible for replenishing the carbohydrate reserves, up to 80 percent of the energy required to initiate growth the following growing season in some grass species.

For warm season grasses, such as alkali sacaton and inland saltgrass, the growth cycle is that of early summer initiation of growth which continues into late summer, followed by the onset of dormancy. No fall regrowth occurs and the root development takes place during the active growing season. Carbohydrate reserves must be replenished during the summer growth period.

Consequently, the time factor with respect to herbivory of grasses is related to the location of the growth points and the season of use. During early spring grazing, the growth points (apical meristems) are located near the ground and are not likely to be removed by grazing. During late spring and summer grazing of cool season grasses, the growth points are well above the ground¹⁰ and the potential for removal is greater. During late summer, the cool season grasses are dormant and grazing does not substantially affect the plant. However, the fall green-up period is an important time for energy storage and grazing below the growing points at this time of the growth cycle can affect carbohydrate production and storage. For warm season grasses the growth period is short, and grazing below the growing points during the summer period reduces the plant's vigor.

⁹ The plant crown or root collar is the portion of the grass plant immediately above the roots. This portion of the plant contains the meristematic tissues, or the zone of cellular division. The root collar is also one area of carbohydrate storage (Richards and Caldwell 1985).

¹⁰ The elevated growing points, or intercalary meristems, are located at the base of the leaf blade where the blade emerges from the sheath.

Duration and Intensity of Herbivory – Grasses

As with the shrubs, intensity is the measure of the amount of above-ground plant biomass removed. However, the amount of above-ground biomass is not as important as to whether or not the growing points are removed. For example, removing 60 percent of the above-ground biomass in early spring is not likely to remove the growing points that are close to the ground. However, removing 60 percent of the above-ground biomass in late spring may be sufficient to remove the growing points. The impacts to the plant from these two scenarios would be very different.

It is also important to note the “uniformity” of the grazing on a given plant. Removing 70 percent of the above-ground biomass by grazing the plant to a uniform height is different than removing 70 percent of the above-ground biomass by grazing one side of the plant. In the first case, the growing points are likely to be removed and the plant would be stressed. In the second case, a portion of the plant would continue to grow unaffected and would be able to continue photosynthesis to provide energy for regrowth and/or activate dormant buds on the portion of the plant removed below the active growing points. Although this is a measure of intensity of herbivory, it is also a function of the duration that the plant is exposed to herbivores and the number of herbivores. In a short exposure, herbivores are more likely to take one bite and move on (i.e., remove one side of the plant or the entire upper portion). In a long exposure, the herbivore is likely to return to the plant and remove the remaining herbage (Norton and Johnson 1983). Similarly, with fewer animals, fewer bites are taken, and with more animals, the probability is greater that the entire plant would be grazed.

Summary

The previous discussion provides a “yardstick” for comparing the various alternatives with respect to time, duration, and intensity of the herbivory. Each of the alternatives can be analyzed with respect to the ability to maintain adequate carbohydrate reserves and plant vigor by:

1. Keeping early defoliation periods short, or delaying initial defoliation;
2. Ensuring adequate leaf area and woody stems remain at the conclusion of a grazing period;
3. Providing adequate time between defoliation events to permit leaf area and carbohydrate reserves to build; and
4. Ensuring adequate residual leaf area and time late in the growing season to permit carbohydrate build-up and bud development.

3.1.2.3.2 Wetlands/Riparian Zones – Assessment Methodology

Although riparian vegetation grows where soil moisture is greater and available longer into the growing season than the upland range sites, the effects of herbivory to these plants are similar to the effects on upland plants. However, a substantial difference is the time available for regrowth due to the presence of soil moisture and nutrients. Overall, effects of herbivory are less when moisture and nutrients are readily available to the plant, as compared to the drier upland sites (Richards and Caldwell 1985).

As described above for vegetation, the first type of effect is that of changes to plant productivity and survival due to herbivory. The second is the effect of the range improvements on the riparian plants and plant communities due to the physical impact to vegetation of constructing the range improvement, as well as the longer-term potential impact from the establishment of non-native, invasive species, concentration of livestock, and distribution of the grazing effort.

Therefore, the analysis of the wetland/riparian zones is similar with respect to herbivory and range improvements as described above for the upland vegetation. However, at the wetlands and springs, there is the potential for additional impacts from soil compaction and removal of the water from the spring to the water developments/troughs. The alternatives are also evaluated with respect to these potential impacts.

3.1.2.3.3 Avian Sensitive Species – Assessment Methodology

BLM reviewed literature as to the habitat requirements and occurrence of each of the raptor species in **Table 3-1** and for sage grouse. Accounts for each species are first discussed in the analysis of the effects of the grazing alternatives for the Sheep Allotment Complex.

The analysis of the alternatives for the Sheep Allotment Complex, Big Springs, and Owyhee allotments each include maps of vegetation communities and fire history with respect to the likely occurrence of the focus species.

Population data for raptors on the Sheep Allotment Complex and Owyhee Allotment is not available. Records of random sightings are of limited use, other than to indicate which raptors may be using the allotments. The limited number of nesting records provides good information regarding the species that breed and raise young in the allotments. However, there have been no follow-up visits to these nest sites to determine if they are used year after year. Although Hawkwatch International, in coordination with the BLM, conducts migratory counts of raptors in the Goshute Mountains each year, which provides trend data, the trend is for the western portion of North America. There is no specific information on the raptor population trend for the individual allotments. The regional trends cannot be linked to the actions on the allotments due to the many factors that may affect raptors that breed and nest in various parts of North America and may winter in southern United States or Central and South America.

While there is more information about sage grouse, the data is collected on a county-wide basis and cannot be directly correlated to any given allotment. Sage grouse population trend data is collected by NDOW from specific trend leks that are counted using specified protocols each year. The group of trend leks is a very small subset of the total leks within Elko County. Although this data is useful in providing NDOW with the “big picture” with respect to sage grouse populations and is used in setting harvest regulations, the data does not lend itself to determining impacts to sage grouse of specific grazing systems or range improvement projects.

Therefore, the approach taken to assess the potential impacts from the various alternatives on the subject sensitive species was to first determine if the livestock grazing had any direct impact on the sensitive species. Indirect impacts through alteration of habitat for the sensitive species or through alteration of prey species’ habitats were considered next. The impacts to habitat were assessed through the analysis conducted for the vegetation, non-native, invasive species, and riparian areas discussed above. Other indirect impacts, such as disturbance (i.e., presence of the livestock or the sheep herder), were assessed with respect to seasonal activities of the sensitive species (e.g., breeding or nesting).

3.2 Sheep Allotment Complex

3.2.1 Vegetation Resources (Including Non-Native, Invasive Species)

3.2.1.1 Affected Environment

The management framework with respect to vegetation and non-native, invasive species is provided in **Appendix B**.

The distribution of vegetation types is shown on **Map 3-4, Appendix A**. The lower valleys are dominated by the salt desert shrub community and receive minimal precipitation throughout the year. The salt desert shrub community transitions

to a sagebrush community on the benches and foothills. Depending on the soil type, the community may be a big sagebrush-bunchgrass or low sagebrush-bunchgrass, or black sagebrush-bunchgrass community. The big sagebrush-bunchgrass community occurs on the deeper, well-drained soils and Wyoming big sagebrush is the dominant shrubs; the low sagebrush-bunchgrass community occurs on soils that have a claypan layer within 18 inches of the surface; and the black sagebrush-bunchgrass community occurs on calcareous soils with a duripan layer within 18 inches of the surface. As the elevation and corresponding precipitation increase, the big sagebrush type transitions to mountain big sagebrush and other mountain shrubs, such as bitterbrush and snowberry, may be associated with the sagebrush community. The two low-growing sagebrush communities (low sagebrush-bunchgrass and black sagebrush-bunchgrass) can be found intermixed with the mountain sagebrush community and at the ridge tops, depending on soil conditions. The pinyon-juniper community, consisting primarily of singleleaf pinyon and Utah juniper, is common on the benches, foothills, and sideslopes of the Goshute Mountains, Toano Range, and Kinsley Mountains. At the sideslopes and upper elevations of the Goshute Mountains and Toano Range, white fir, limber pine, bristlecone pine, Englemann spruce, and curleaf mountain mahogany are present. Pleistocene-relic populations of Rocky Mountain juniper, prostrate juniper, and cinquefoil are found on the west side of the Goshute Mountains. The riparian zones also support trees, such as alder, chokecherry, and willows, in some areas.

The BLM conducted a survey in 1998 for non-native, invasive species within the Sheep Allotment Complex and found the following noxious weeds:

- Houndstongue – UT/NV North Allotment
- Saltcedar – UT/NV North Allotment – (private lands);
- Canada thistle – Lead Hills Allotment;

- Hoary cress – Lead Hills Allotment (private lands);
- Squarose knapweed – Lead Hills Allotment.

In addition, cheatgrass, halogeton, several mustard species, and burr buttercup occur within most of the allotments.

There are a variety of old water developments, troughs, and wild horse traps scattered throughout the allotments. Some are located on private lands and some are on public lands. Due to their age, many of these developments are considered cultural resources.

3.2.1.2 Environmental Consequences

The Sheep Allotment Complex is used by sheep, wild horses, and wildlife. The wild horses and wildlife are present throughout the entire year, and sheep are present only during the late fall through early spring (November through March, April, or May, depending on the allotment). During the fall and winter, sheep are primarily browsers, feeding on shrubs and only a limited use of dry grasses. Winterfat (white sage), bitterbrush, mahogany, green molly, and rabbitbrush retain leaves throughout the winter. In the spring, sheep transition from browse to herbaceous forage; grasses and forbs. Therefore, the analysis with respect to plant productivity and survival due to herbivory focuses on the timing, duration, and utilization (intensity of grazing) of the available forage for each alternative.

Although the term “range improvements” encompasses many types of actions, there are only three types of range improvements proposed for the Sheep Allotment Complex, which include: exclosures, wells, and troughs associated with spring developments. The method of analysis of range improvements with respect to vegetation is to determine how the construction of the range improvement would impact the vegetation, how the function of the range improvement would affect vegetation, and how the range improvement would alter livestock behavior and subsequent effects to vegetation.

3.2.1.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

The previous grazing permits for the Sheep Allotment Complex provided for a total of 39,061 AUMs of authorized fall/winter/spring use for the allotments with grazing from approximately mid-November to the end of March or April, with the exception of the UT/NV South, which was used until May 10 annually (Table 2-2). The Sugarloaf and White Horse allotments implemented deferred grazing of the salt desert shrub community after April 1. Wild horse AUMs were set at 1,730 for the year.

Average actual use over the period 1985 to 1999 was 17,573 AUMs, or 21,427 AUMs below the permitted use.

Plant Productivity

Under this alternative, the sheep would be in the allotments during the dormant season and would use the browse species through winter in addition to some use of dormant grasses. Early spring use would be on a combination of browse and herbaceous plants. Browsing during the dormant season would remove the terminal buds and some lateral buds, or growing points, necessary for the initiation of growth during the spring. The result would be some reduction in plant growth during the growing season (i.e., fewer initial leaders and delay before dormant buds are activated). Browsing during the spring would contribute to reduction of annual growth by removing the new growth and possibly additional growth points. Current year’s leader growth would be delayed and productivity would be reduced.

As indicated in **Table 2-2**, the period of use would be between four and six months, depending on the allotment. This is ample time for repeated browsing to occur, which would allow for more growing points to be removed during the winter months than under a shorter duration grazing regime. Under this system the intensity, as indicated by the Use Pattern Mapping and Key Area Utilization monitoring (BLM 2000a, Sheep Allotment Complex Evaluation), was highly

variable between years among the allotments between 1985 and 1999. The percentage of the allotment use pattern mapping that was mapped as moderate (i.e., 41 to 60 percent utilization) or greater (i.e., heavy - 61 to 80 percent; severe – 81 to 100 percent) for each year that use pattern mapping was conducted was averaged over the period 1985 to 1999. The mean, highest, and lowest percentages are presented in **Table 3-1**.

At moderate levels of utilization there is likely to be some reduction of growth or carbohydrate production in the shrubs. However, the moderate level of browsing is not likely to lead to plant mortality. At the heavy and severe levels, reduction in productivity during the growing season would result in shorter leaders and fewer buds being produced. Root growth would also be reduced as the photosynthate would be diverted to new leaves, buds, and leaders to maintain photosynthetic processes, rather than root replacement and growth. Repeated heavy and severe utilization would indicate a potential for loss of plant vigor and eventually loss of the plants, as less new growth is realized each successive year. As the amount of total new growth (i.e., forage) per plant decreases over time, the livestock take more bites per plant to remove the same amount of forage. The plants would soon reach a threshold where the amount of photosynthesis the plants are able to conduct is not sufficient to keep up with the maintenance requirements of the plant, leading to eventual plant mortality.

The allotment monitoring data indicate that while some reduction in growth and/or root growth/replacement was occurring, all of the allotments except Sugarloaf had moderate or greater utilization over less than one-half of the allotment, on average. Conversely, over half of the acreage in all the allotments except Sugarloaf was receiving slight to light use (i.e., 1 to 21 percent – slight and 21 to 40 percent – light). Continuation of this level of utilization should not result in a long-term reduction in productivity in these areas. However, in the areas receiving heavy to severe use, shrub productivity is anticipated to decline.

In the 67 years of combined monitoring over the nine allotments (during the period 1985 to 1999), only six years had utilization levels of heavy (61 to 80 percent) on more than ten percent of any one allotment. The highest percent of area that received heavy utilization was 21.7 percent on any allotment. Thus, the impacts to the shrubs have been occurring on relatively small areas and repetitive use was occurring on even less area. Nonetheless, the continuation of this level of browsing would not meet the rangeland health standards.

Similarly, the utilization at the Key Area monitoring locations within the allotments was below 50 percent utilization on the key shrub species with a few exceptions (BLM 2000a, Allotment Evaluation). Utilization of winterfat exceeded 50 percent several times on several allotments. However, winterfat, like sagebrush, maintains some leaf material during winter and is able to re-sprout after winter browsing, but does not respond well to growing season browsing.

Trend data used in the allotment evaluation indicated that ecological status at the Key Areas was variable with decreases and downward trend at some Key Areas and improvement or stable at other Key Areas.

As indicated in **Table 2-2**, the majority of the livestock use in these allotments would occur during the dormant season for the grasses, and sheep are primarily browsers during the winter. However, in areas where utilization levels of shrubs exceeds the moderate level, winter use of grasses may occur to the point where the growing points at the base of the plants could be impacted. Repeated heavy or severe use in the same areas would have a long-term impact on the grass plant vigor. The allotment monitoring data indicates that this impact may be occurring within limited portions of the allotments.

Potential for impact to cool season grasses occurs in the late winter/early spring use (late March to mid-May) when the grasses initiate growth and the growing points elevate as the tillers elongate. Removal of the growing points

Table 3 - 2: Percentage of Allotment Use Pattern Mapping with Moderate or Greater Use, 1985 to 1999

Allotment/Pasture	Mean (percent) ¹	High (percent)	Low (percent)	Years Monitored
Leppy Hills	19.8	41.3	0	5
UT/NV North	14.8	46.1	3.7	6
UT/NV South	38.9	64.2	12.3	8
Lead Hills	35.8	57.9	13.9	8
White Horse	23.2	55.8	23.2	6
Sugarloaf	59.2	71.2	42.1	8
Ferber Flat	44.2	85.3	5.5	8
West White Horse	41.3	62.6	0	11
Boone Springs	18.7	29.5	4.8	7
Mean	32.9			

¹Data from Appendix 1 of the 2000 Allotment Evaluation.

during this time period requires the plant to activate dormant buds, which requires diversion of the energy produced by photosynthesis. The rate of photosynthesis would be reduced by the removal of leaf tissue and the energy that is produced, would be diverted to initiating new growth, either activation of dormant buds or replacing removed tissue. Energy for root growth and replacement would be temporarily unavailable.

The early spring use has potential to impact the grasses in years when spring moisture is not abundant. The cool season grasses have the ability to regrow after herbivory if there are moisture and nutrients to support the growth. Therefore, the duration is relative to the amount of moisture available. Intensity of utilization with respect to the growing points is the most important factor with the spring grazing. The allotment evaluation data (BLM 2000a, Allotment Evaluation) indicates the utilization on Indian ricegrass (the key herbaceous forage species at most of the Key Areas) commonly exceeded 50 percent utilization. This level of utilization in the

early spring when plant growth is just starting is likely to remove the growth points from the tillers. While an early season impact may occur, the removal of the livestock during the remaining portion of the growing season (i.e., late spring-summer and early fall) allows the plants to complete the growth cycle and conduct root growth and replacement. The existing frequency monitoring data for the allotment is somewhat inconclusive with respect to long-term impacts to grasses because of the relatively few years for which frequency data was available and the variability between years in terms of growing conditions (i.e., soil moisture and temperature).

With respect to the indicators of plant vigor and carbohydrate production for root growth and replacement:

- The early spring use on the allotments would vary from April 1 to April 15, April 20, or April 30. Only the West White Horse and Boone Springs allotments complete grazing by March 31 each year. The system on the other allotments does not delay initial

defoliation, and the early defoliation periods occur over short (i.e., 15 days) to long (i.e., 30 days) periods, annually.

- The grazing period ends when sufficient moisture exists to allow regrowth (in most years) and monitoring indicates that adequate leaf area remains at the conclusion of the grazing period to continue carbohydrate production and plant growth.
- The time between defoliation events is approximately six months and this period of non-grazing includes a portion of the springs/summer growing season, the summer dormancy period, and the fall growing/respiration period (for cool season grasses). Shrubs continue growing throughout the non-grazing period.
- Residual leaf area is sufficient for carbohydrate build-up and bud development.

This system is generally compatible with the growing and dormant periods of the vegetation communities, with the exception of the annual early spring grazing which has potential to affect cool season grass and shrub production and vigor. Localized heavy herbivory on shrubs and grasses in the winter may also impact the ability of these plants to grow, but this does not appear to be an allotment-wide problem. Under this alternative, localized, long-term impacts to shrubs and grasses would continue in areas that receive repeated heavy to severe utilization. As these localized areas exhibit the long-term reduction in plant growth and/or mortality, the livestock would be expected to expand the area of impact into adjacent vegetation. Rangeland health standards for the upland vegetation would not be met under this alternative.

Range Improvements

The primary impact of the existing range improvements on vegetation under this alternative was the concentration of wild horses

at water sources. The instances of heavy and severe utilization were associated with the water sources – springs, seeps, troughs, wells, and water tank locations (see **Map 2-1, Appendix A**). This use was primarily attributed to year-long use by wild horses. The repeated use of the riparian shrubs and grasses, especially at the heavy to severe level, results in very little new above-ground growth each year and root growth and replacement are also reduced. This leads to decreased plant vigor and health over time. Repeated browsing of the shrubs removes the current year's growth and associated growing points, which stunts the plant growth and reduces productivity. As indicated above, the livestock are removed early in the season, which allows growth to occur each year. However, the summer-long use of these areas by wild horses does not allow sufficient rest from grazing to maintain vigorous shrub or grass plants at these riparian sites.

Non-Native, Invasive Species

Sheep can be vectors for the transfer of seed from one area to another by transporting the seed in the wool and hooves, and passing seed through the digestive tract. Due to the grazing period in these allotments, seed from non-native, invasive species have disseminated prior to turn in and seed has not yet been produced by the time the sheep have been removed from the allotments in the spring. Some seed may be picked up in the hooves and wool while bedding, but this is not anticipated to be a major source of seed transfer.

There is also potential for the sheep to have seed in their wool from their summer range which was picked up before arriving at the allotments. This would be a source for new weeds to enter the allotments. The extent to which this is occurring is not known.

Vehicular traffic either associated with the livestock support functions, such as water hauling and transport of sheep camps, or recreational activities, are also a source of invasive species establishment and spread. Because the sheep activity occurs in the late fall through early spring, most of the livestock support functions occur after

seed has already disseminated. Recreational use of the area during the summer months has higher probability of transferring seeds throughout the area.

The range improvements, especially water sources, result in concentrations of wild horses at these locations. The level of disturbance at these sites created areas for non-native, invasive species to establish. However, these sites are used annually, and the hoof action that contributed to the loss of vegetation at these sites also has some controlling action on the non-native, invasive species (but is not a solution to this issue).

Repeated use, both within a grazing season and between years, of bedding areas has led to large areas of cheatgrass on the foothill benches in the White Horse and West White Horse allotments. This appears to be the result of temperature inversions and the sheep move to the benches to be above the cold air layer and fog at the valley floor.

To date, the level of noxious weed infestations within the allotments has been low and is well within the ability of the BLM and permittees to control. However, the presence of noxious weeds increases the potential for more noxious weed infestations to occur as local seed sources now exist.

The disturbed areas associated with bedding sites and water sources have been invaded by cheatgrass. Continued use of these sites increases the potential for seed transfer and continued surface disturbance that provides suitable seedbed sites for other non-native, invasive species. To date, the level of non-native, invasive species infestations throughout the allotment are increasing.

3.2.1.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

The grazing system proposed in the MUD is described in Section 2.3.2. The permitted livestock use of 26,652 AUMs under this

alternative represents a reduction of permitted use of 12,409 AUMs from the previous grazing system (Alternative 1). The interim grazing plan would be initiated with only 17,474 AUMs, or a reduction of over 21,500 AUMs from Alternative 1. Essential range improvements proposed under this alternative would be planned and constructed in accordance with the standard operating procedures specified in Appendix C.

Period of use for the nine allotments would be November to the end of April, depending on the allotment (**Table 2-4**). However, within the individual allotments, the Use Areas would have specified periods of use which would permit the implementation of rest rotation or deferred rotation systems for specific Use Areas. Wild horse AUMs would be reduced to 568 AUMs, a reduction of 1,162 AUMs.

Plant Productivity

Under this alternative, for both the interim and final grazing systems, the sheep would be in the allotments during the dormant season and would be using the browse species through winter. Early spring use would be on a combination of woody browse and herbaceous plants. Browsing during the dormant season would remove the terminal buds and some lateral buds, or growing points, necessary for the initiation of growth during the spring. The result would be some reduction in plant growth during the growing season (i.e., fewer initial leaders and delay before dormant buds are activated). Browsing during the spring would further reduce annual growth by removing the new growth and possibly additional growth points. Current year's leader growth would be delayed and productivity would be reduced.

However, due to the rest rotation and deferred rotation systems for the spring Use Areas, the effect on the shrubs would be limited to one Use Area per year per allotment with rest on the other Use Area(s) during the early spring growing season. Therefore, impacts to shrub growth and production that occur in one year would be offset by the opportunity for the shrubs to recover during the next one or two years of rest. The shrubs in the rested Use Area would produce

more leader growth relative to the previous grazing system (i.e., no rest) and have one or two years of complete rest to conduct root growth and replacement.

This alternative should improve the vigor of winterfat and other key shrubs due to the reduced growing season grazing of this species.

As indicated in **Table 2-4** and Section 2.3.2, the period of use within the allotments would be between four and six months, depending on the allotment. However, due to the implementation of Use Areas, the duration in any one location is reduced relative to Alternative 1. The rotation of the spring Use Areas (and fall Use Area for Leppy Hills and UT/NV North allotments and winter Use Area for West White Horse Allotment) and deferral of Use Areas for Boone Springs Allotment would limit the amount of repeat browsing on shrubs that would occur, especially during the early growing season.

The intensity, or utilization level, is anticipated to be more uniform as the sheep would make more use of areas that historically received slight or light use, and less use of the areas that have received heavy to severe use. The Use Pattern Mapping and Key Area Utilization monitoring is likely to show more of the allotment in the light (21 to 40 percent) and moderate (41 to 60 percent) utilization levels on the previous year's growth. The monitoring should also indicate that less of the allotments are in the heavy to severe utilization levels. This would be in keeping with the allotment objective of 50 percent use or less on salt desert shrubs or other key shrub species. At moderate levels of utilization there is likely to be some reduction of plant above-ground growth or root growth in the shrubs. However, under this alternative, when the 50 percent utilization level is approached in all Use Areas, the livestock would be removed from the Use Area or allotment in five days. Therefore, browsing the shrubs during the winter season with this utilization objective would leave sufficient growing points to allow sufficient leader growth and leaf production to maintain plant vigor.

The rest rotation of the spring Use Areas and shorter duration of spring use would reduce the intensity of browsing on the shrubs during the initial growth period, relative to Alternative 1. The spring utilization objective of 30 percent or less use of current year's growth of salt desert shrubs or other key shrub species, along with the rest of one to two years of these areas, would result in minimal effects to shrubs. This system should definitely improve the vigor of winterfat due to the reduced growing season grazing of this species.

As indicated in **Table 2-4**, the majority of the use in these allotments would occur during the dormant season for the grasses, and sheep are primarily browsers during the winter. Winter use of the grasses is not anticipated to exceed levels that would impact the growing points at the base of the plants.

Potential for impact to grasses occurs in the late winter/early spring use (March to mid-May) when the grasses initiate growth and the growing points elevate as the tillers elongate. The magnitude of this impact is based on duration and intensity of herbivory.

As described under Alternative 1, the early spring use has potential to impact the grasses in years when spring moisture is not abundant or when intensity of grazing results in too many new tillers and growing points removed. The cool season grasses have the ability to regrow after herbivory if there are nutrients and moisture to support the growth. Therefore, the duration is relative to the amount of moisture available. Under this alternative, none of the allotments receive spring use in May, and Boone Springs and West White Horse allotments receive no livestock use during the growing season. Therefore, grazing on all spring Use Areas should be completed when there is moisture available for regrowth, with the exception of extreme drought years. In addition, the application of resource protection measure #11 in Section 2.2.1 would reduce potential for this impact.

Intensity or utilization with respect to the growing points is the most important factor with the spring grazing. However, the rest rotation systems that

would be implemented under this Alternative would allow the plants in Use Areas grazed in a dry spring to recover during the following one or two years of rest when the plants would complete their growth cycle in the absence of early spring sheep grazing. Therefore, over time the vigor of the grass plants should show improvement.

With respect to the indicators of plant vigor and root growth/replacement:

- The early spring use would occur on the allotments from April 1 to April 15, April 20, or April 30. Grazing on the West White Horse Allotment would be completed by February 28 each year under this alternative and grazing on the Boone Springs Allotment would be completed by March 31 each year. The system on the other allotments consists of rest rotation of the spring Use Areas. This does not delay initial defoliation, and the early defoliation periods occur over short (i.e., 15 days) to long (i.e., 30 days) periods; however, the rest rotation system provides time for recovery (see below).
- The grazing period ends when sufficient moisture exists to allow regrowth and adequate leaf area is anticipated to remain at the conclusion of the grazing period to continue growth and carbohydrate production.
- The time between defoliation events is at least six months for the winter Use Areas and up to two years for the early spring Use Areas. This is adequate for recovery of the grasses and shrubs.
- Residual leaf area is sufficient for carbohydrate build-up and bud development.

This system is compatible with the vegetation communities. The early spring defoliation is followed by one or two years of rest, which is adequate recovery time for the grasses and shrubs. Movement among the Use Areas limits

the duration and intensity of herbivory on the shrubs and grasses.

Once the range improvements have been constructed and the short-term objectives have been achieved, as determined by monitoring, the AUMs would be increased through a phased process, with monitoring to determine when or if additional increases, decreases, or no change is warranted. The effects to vegetation under the final grazing system would be the same as for the interim grazing system, providing the monitoring is used to determine if increases in AUMs above the interim grazing plan level are warranted.

Range Improvements

As indicated above, the implementation of the proposed interim and final grazing systems, and reduction in wild horse numbers to AML are anticipated to address some of the issues identified in the allotment evaluation, such as the time, duration, and intensity of livestock grazing and time and intensity of wild horse grazing. However, duration of use by wild horses of the existing water sources and associated vegetation cannot be addressed by the proposed grazing system. The range improvements proposed under this alternative (see **Table 2-12** and **Map 2-1, Appendix A**) are primarily designed to address the intensity of use by wild horses at the seeps and springs and to provide water sources for better distribution of wild horses (i.e., reduce the intensity and duration of wild horse grazing in the areas receiving heavy to severe use).

The proposed spring enclosures and troughs to deliver water outside of the enclosure would improve the vigor of the riparian vegetation associated with the seeps and springs by eliminating repeated use of these plants. Repeated use of the riparian vegetation has resulted in the removal of growing points of shrubs (willows) and grasses and subsequent loss of vigor. Trampling at these sites has also physically impacted the plants through mechanical sheering of the above-ground plant parts and soil compaction. Consequently, changes in the plant community have occurred at some locations. The proposed enclosures are

anticipated to reverse the trend in declining plant vigor and changes in plant community composition.

Spring developments that leave water at the spring source would also be necessary to maintain the riparian vegetation. The adherence to BLM SOPs (see **Appendix C**) during construction or repair of range improvements would reduce potential impacts to plants from range improvement construction.

Non-Native, Invasive Species

The potential impacts of sheep use under this alternative would be less than the other alternatives. It is less likely that sheep would be in the vicinity of the riparian areas in the higher elevations when their authorized use periods ends on March 31 because of the greater amounts of snow still present at that time. Therefore, because the sheep would be less likely to visit the riparian areas where non-native invasive species are likely to prosper, the sheep are less likely to impact riparian conditions or spread the seeds of non-native, invasive species from these areas. Implementation of the grazing system proposed under this alternative would reduce the repeated use of bedding and foraging areas through rotation among Use Areas. The rotation would reduce the amount of time that sheep are in a particular area and their use of bedding areas within a Use Area. This would reduce the mechanical effects of concentrated and repeated hoof action on the vegetation and soil surface, which provides a suitable seedbed for non-native, invasive species. By reducing the potential for these species to establish, and by improving the vigor of the native perennial shrubs and grasses, the proposed grazing system is anticipated to slow the spread of non-native, invasive species within the allotments.

Installation of the range improvements under this alternative would improve the condition of riparian vegetation at some of the springs within the allotments. Because degraded riparian areas are often the site of initial noxious weed and other non-native, invasive species infestations, the improved riparian conditions should result in

fewer infestations of these undesirable species. Delivery of the water from these springs to troughs outside the enclosure would result in the concentration of wild horses at the water sources within the upland plant community. While some impact to the upland vegetation is likely to occur and is likely to result in establishment of non-native, invasive species, the potential for establishment on these drier sites is less than within the degraded riparian areas, except for cheatgrass. Therefore, it is anticipated that there would be a net reduction in potential for establishment and spread of non-native, invasive species under this alternative.

Livestock support functions (e.g., water hauling, sheep camp moving, etc.) also contribute to the spread of non-native, invasive species. However, the extent of this impact is unknown, as it cannot be separated out from other vehicle traffic in the area related to recreation or other human activities. However, it should also be noted that the livestock support function activities take place after the period of seed dissemination, and therefore are less likely to result in the transportation of seed than recreational travel or similar activities during the period of seed dissemination.

3.2.1.2.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Under this alternative, the grazing system would be the same as the system proposed under Alternative 2, except the seven spring enclosures would not be constructed. Permitted use under this alternative would be the same as for Alternative 2. The permitted livestock use of 26,652 AUMs under this alternative represents a reduction of permitted use of 12,409 AUMs from Alternative 1. However, the interim grazing plan would be initiated with only 17,474 AUMs, or a reduction of over 21,500 AUMs from Alternative 1.

Plant Productivity

It is anticipated that the effect of implementation of the interim and final grazing systems under this

alternative would be the same as described above for Alternative 2 for the salt desert shrub and sagebrush plant communities. Overall improvement in the health and vigor of the plants would be achieved.

With respect to the indicators of plant vigor and root growth/replacement:

- The early spring use would occur on the allotments from April 1 to April 15, April 20, or April 30. Grazing on the West White Horse Allotment would be completed by February 28 each year under this alternative and grazing on the Boone Springs Allotment would be completed by March 31 each year. The system on the other allotments consists of rest rotation of the spring Use Areas. This does not delay initial defoliation, and the early defoliation periods occur over short (i.e., 15 days) to long (i.e., 30 days) periods; however, the rest rotation system provides time for recovery (see below).
- The grazing period ends when sufficient moisture exists to allow regrowth and adequate leaf area is anticipated to remain at the conclusion of the grazing period to continue carbohydrate production.
- The time between defoliation events is at least six months for the winter Use Areas and up to two years for the early spring Use Areas. This is adequate for recovery of the grasses and shrubs.
- Residual leaf area is sufficient for carbohydrate production and bud development.

This system is compatible with the upland vegetation communities. The early spring defoliation is followed by up to two years of rest, which is adequate recovery time for the grasses and shrubs. Movement among the Use Areas limits the duration and intensity of herbivory on the shrubs and grasses.

However, vegetation conditions at riparian areas are not likely to improve substantially under this alternative. The proposed livestock management decisions under this alternative do not address the conclusions of the FMUD that wild horses were the primary causal factor for non-attainment of the standards at these sites. The term and condition mandating a minimum buffer of ¼-mile between sheep and riparian areas is not likely to affect riparian conditions as sheep use at these sites would take place during the dormant period or early in the season when water dependence is at its lowest and ephemeral water is available abundantly throughout the allotment.

Range Improvements

Continued season-long use of the riparian vegetation by wild horses would occur under this alternative, but by fewer wild horses. The repeated use of the riparian shrubs and grasses, even by reduced horse numbers, would result in very little growth or replacement of root systems, which would lead to decreased plant vigor and health over time. Repeated browsing of the shrubs removes the current year's growth and associated growing points, which stunts the plant growth and reduces productivity.

Reducing wild horse numbers to the AML is anticipated to reduce many of the impacts attributed to wild horses within the allotments. However, when grasses dry out in late summer, the wild horses will focus their grazing on the riparian vegetation. Due to the limited number of water sources in the allotment, there may be impacts, or at least a lower rate of improvement, to these few riparian areas in the absence of protective fences.

It is anticipated that the improvement in riparian areas would be modest under this alternative.

Non-Native, Invasive Species

The effects with respect to non-native, invasive species under this alternative would be similar to the effects as described under Alternative 1, but to a lesser degree and greater than the effects anticipated under Alternative 2. Increased infestations of non-native, invasive species would

be expected to occur, with initial infestations occurring within the riparian areas at springs that would be slowly recovering from past use. Livestock and wild horses would continue to use these sites for water, and seeds of the undesirable species would be spread by the animals and other dispersing agents (i.e., wind and humans) to other locations within the allotment.

The rotation and rest would help maintain the vigor of native vegetation communities, making the vegetation less susceptible to invasion by non-native, invasive species. The threat of establishment or increase in noxious and invasive species is reduced under this alternative, similar to alternative 2 as the riparian areas are protected from wild horse use and damaged vegetation recovers vigor.

3.2.1.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

The white sage or winterfat plant community and sage grouse nesting habitat were identified as key sensitive species habitats that would be addressed under this alternative. Early spring grazing would be eliminated and grazing would be restricted to the dormant season. One month of use would be eliminated, affecting permittee's movement to other allotments in Utah or leading to the permittee having to provide forage elsewhere. Shearing would take place elsewhere. The essential range improvements described in Alternative 2 would be constructed under this alternative. The impacts to riparian areas under this alternative would be similar to those for Alternative 2 except the earlier removal of livestock would further reduce the potential impacts.

Under this alternative, the grazing system would be the same as the system proposed under Alternative 2, except the seven spring closures could be constructed. Permitted use under this alternative would be the same as for Alternative 2. The permitted livestock use of 26,652 AUMs under this alternative represents a reduction of

permitted use of 12,409 AUMs from Alternative 1. However, the interim grazing plan would be initiated with only 17,474 AUMs, or a reduction of over 21,500 AUMs from Alternative 1.

Plant Productivity

Under this alternative all grazing in the Sheep Allotment Complex would occur between November 1 and March 31 each year, and several of the allotments have rotations for Use Areas during the period March 1 to March 31 and/or Use Areas that would be excluded from livestock during specified periods each year (e.g., Morris Basin in the Leppy Hills and Morgan Basin in UT/NV North Allotment). Therefore, essentially all of the herbivory would take place during the dormant period or for a short duration on some plants that start growth in March. Consequently, the timing of the herbivory would occur when the least impact to the shrubs is likely to occur.

The allotment grazing plans under this alternative also include Use Areas for the winter months that have utilization standards. The maximum utilization on last year's growth would be 50 percent and the livestock would be moved to the next Use Area. Upon reaching the 50 percent utilization level throughout the winter Use Areas, or reaching the end of the specified grazing period, the livestock would be removed from the allotment.

The rotation of the herbivory during the period March 1 to March 31 that includes rest two out of three years for most late winter Use Areas would protect the shrubs during the period when the shrubs may be breaking dormancy. Herbivory on any new growth would be extremely limited in extent and followed by two full years of growing season rest. Therefore, the duration and intensity of herbivory during winter and late winter would be limited to an extent that would allow substantial growth of roots and above ground leaders during the spring and summer following the winter use.

All grazing of the grasses would occur while the grasses are dormant. Thus grazing would occur at a time when plants are least susceptible to

impact because the growing points are close to the ground in the base of the plants. Occasionally, when spring temperatures occur early in the season, some early defoliation of new growth may occur.

Under this alternative, the implementation of Use Areas, late winter Use Area rest rotation, reduction in permitted AUMs, and the absence of early spring grazing would provide sufficient protection of the growing points on the grasses to allow cool season grasses to complete their growth cycle and replace roots each year. The warm season grasses would not experience any measurable effect under this alternative.

With respect to the indicators of plant vigor and carbohydrate reserve replenishment:

- The early spring use would not occur on the allotments. All grazing would be completed by March 31 each year. Therefore, early defoliation would not occur, and plants would be able to complete the growth cycle in the absence of livestock grazing, except in years when spring arrives early.
- Adequate leaf area would remain at the conclusion of grazing because growth would not be initiated before grazing ceases.
- The time between defoliation events is at least six months for the winter Use Areas. The late winter Use Areas would be rotated, providing two full years of rest.
- Residual leaf area is sufficient for carbohydrate build-up and bud development.

This system is compatible with the vegetation communities. The late winter use is followed by two years of rest, which is adequate recovery time for the grasses and shrubs. Movement among the Use Areas limits the duration and intensity of herbivory on the shrubs and grasses. This system would benefit winterfat communities

by eliminating any growing season use of this species.

Range Improvements

The same range improvements identified for Alternative 2 would be included under Alternative 4. Therefore, the beneficial and adverse effects identified under Alternative 2 would also occur under this alternative. In addition, the earlier removal of livestock would further reduce the potential impacts to vegetation under this alternative.

The implementation of the proposed grazing system and reduction in wild horse numbers to AML are anticipated to address some of the issues identified in the allotment evaluation, such as the time, duration, and intensity of livestock grazing and time and intensity of wild horse grazing of sensitive species' key habitats. However, duration of use by wild horses of the existing water sources and associated vegetation cannot be addressed only by the proposed grazing system as the wild horses are not moved from one area to the next within the allotments. Reducing the number of wild horses to AML would reduce impacts due to wild horses.

Due to fewer wild horses, the amount of soil compaction and intensity of grazing at the spring sites would be less than under Alternative 1, but the same or less than under Alternative 2, and the less than impacts described under Alternative 3.

Non-Native, Invasive Species

Implementation of the interim and final grazing system proposed under this alternative would reduce the repeated use of bedding and foraging areas. This would reduce the mechanical effects of concentrated and repeated hoof action on the vegetation and soil surface, which provides a suitable seedbed for non-native, invasive species. By reducing the potential for these species to establish, and by improving the vigor of the native perennial shrubs and grasses, the proposed grazing system is anticipated to reduce the spread of non-native, invasive species within the allotments. This reduction in spread of non-native

invasive species would be comparable to the effects under Alternative 2, as the riparian areas would be protected from wild horse use and the damaged vegetation would have opportunity to recover.

3.2.2 Wetlands/Riparian Zones

3.2.2.1 Affected Environment

The management framework with respect to wetland/riparian zones is provided in **Appendix B**.

There are no perennial streams within the Sheep Allotment Complex. Precipitation averages only six to seven inches at the valley floors and as much as six to ten feet of snow may accumulate in the high mountain elevations. The limestone bedrock within the Goshute Mountains and Toano Range is highly fractured and most of the snowmelt enters the groundwater system. Springs and seeps are characterized by limited flows and narrow zones of wet and dry meadows. Vegetation is predominantly sedges, rushes, chokecherry, and bluegrass. Chokecherry and willow occur at some spring sites. Springs within the allotments are indicated on **Map 2-1**. Mud Springs on the UT/NV North Allotment has been fenced and cottonwood reproduction occurs both within and outside of the fenced spring area.

3.2.2.2 Environmental Consequences

The Sheep Allotment Complex is used by sheep during the late fall through early spring. While winter snow and precipitation provide some water, the amount and availability vary by year. The springs and other water developments are dependable water sources for the wild horses and wildlife. Wild horses and wildlife inhabit the area on a year-round basis. The springs are primary water sources for these animals, with increased importance in late summer.

With respect to riparian vegetation, sheep are primarily browsers during the fall and winter, feeding on shrubs and only a limited use of dry grasses or riparian vegetation. In the spring,

sheep transition from browse to herbaceous forage, and riparian areas are somewhat more attractive as foraging areas. However, the sheep are removed from the allotments well before the hot season.

3.2.2.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Much of the failure to meet riparian allotment objectives and rangeland health standards was attributed to wild horses. The year-long use of the spring and seep areas by wild horses under this alternative would impact vegetation due to the time, duration, and intensity of the grazing at these locations. Livestock would be removed early in the spring, prior to the hot season, and would not have much effect on riparian vegetation. However, wild horse use would continue during the hot season. Improvement of the riparian vegetation is not anticipated under this alternative. Potential for non-native, invasive species to establish at riparian areas would be high under this alternative.

3.2.2.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Under this Alternative, seven spring areas would be protected by construction of exclosures and development of water troughs outside the exclosures. Wild horse use of these areas, especially during the hot season, would be eliminated. The spring and riparian vegetation would return to functioning condition. Other springs for which exclosures are not proposed would continue to be impacted by wild horse use, but the impacts are likely to be less due to the reduction in wild horse numbers under this alternative. The riparian impacts identified for Alternative 1 would be eliminated under this alternative following completion of planning and construction of the proposed range improvements, using the SOPs in **Appendix B**.

3.2.2.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

The changes in livestock grazing would not measurably improve the riparian vegetation condition because the livestock are removed before the use of riparian vegetation is a concern. The impact to riparian vegetation has been attributed to wild horse use of these areas during the hot season. The reduction in wild horses under this alternative would be to the same AML as for Alternative 2. However, even at AML, wild horses may concentrate at these water sources and the riparian vegetation may not recover, or may not recover as quickly, as under Alternative 2. The impacts to all springs are likely to be less due to the reduction in wild horse numbers under this alternative as compared to Alternative 1. Achievement of the riparian rangeland health standard is not anticipated under this alternative, at least in the short-term. The trampling and over utilization of vegetation indicated in Alternative 1 would continue under this alternative. The term and condition preventing sheep within ¼-mile of springs and seeps would not contribute to the recovery of the sites due to the proposed use periods which place livestock in the allotment during the period of lowest dependence on water and at a time when abundant ephemeral water is present throughout the allotments.

3.2.2.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this Alternative, seven spring areas would be protected by construction of exclosures and development of water troughs outside the exclosures, using the guidance of the SOPs for their construction. The benefits to riparian areas for Alternative 2 would be realized. The changes in livestock grazing would not measurably improve the riparian vegetation condition because the livestock are removed before the use of riparian vegetation is a concern. Ephemeral water is generally abundant throughout the allotment,

lowering the dependence on perennial water sources.

3.2.3 Avian Sensitive Species

3.2.3.1 Affected Environment

The management framework with respect to avian sensitive species is provided in **Appendix B**.

The sensitive raptor species that may occur in the Sheep Allotment Complex included northern goshawk, golden eagle, short-eared owl, long-eared owl, burrowing owl, flammulated owl, ferruginous hawk, Swainson's hawk, prairie falcon, and peregrine falcon. Sightings of these species are shown on **Map 3-5**. Sage grouse have historically used sagebrush habitat within the complex, but only on the western side of the Boone Springs Allotment. A description of the habitat requirements and food habits of each species is provided below.

Golden Eagle

Golden eagles breed in a variety of habitats, generally in open country such as shrub-steppe, grassland, desert, savanna and alpine tundra; they may also be found in open wooded country (NatureServe 2005). Golden eagles are most often found in hilly or mountainous regions, and typically breed in Nevada at elevations between 7,000 to 9,000 feet (Nevada Natural Heritage Program 2005).

Golden eagles nest primarily on cliffs, although they will also use large trees or artificial structures (Kochert et al. 2002). Eagles may nest on the ground in parts of Nevada where cliffs and trees are scarce (Seibert et al. 1976); ground nests are usually placed on hillsides (Ward et al. 1983). Cliff nests are built on several rock substrates including sandstone, shale, granite gneiss, limestone, basalt, and granite (Schmalzried 1976); loose substrates are avoided (Baglien 1975). Nesting substrates range between zero to 350 feet in height, with an average cliff height of 116 feet (Kochert et al. 2002). In Nevada, nest sites were found with a full range of aspects, with and without overhangs, and often but not

exclusively near updrafts (Seibert et al. 1976). Each pair requires several suitable nest sites; pairs typically establish several nests within their breeding territories (NatureServe 2005). Some nests will be used repeatedly in consecutive years, while others are used on a rotational basis. Historic nests may be used by the same pair over a period of decades.

Golden eagles feed primarily on small mammals such as jackrabbits and ground squirrels, and may also eat insects, snakes, birds, juvenile ungulates, and carrion. Eagle reproductive success has been linked to jackrabbit numbers (NatureServe 2005). Eagles rarely attack large, healthy mammals (e.g. deer, sheep) (Terres 1980). Eagles will hunt aloft and from perches when available.

Golden eagles have been documented within the Sheep Allotment Complex. Nesting occurs within the limestone rock cliffs in the canyons of the Goshute Mountains and Toano Range. Foraging occurs along the foothills, benches, and valleys.

Northern Goshawk

Large tracts of mature or old-growth forest are the primary breeding and foraging habitats for northern goshawks (NatureServe 2005). Nests are typically constructed in the largest trees of dense, mature stands with high canopy closure (60 to 95 percent) and sparse groundcover, although goshawks will rarely nest in relatively open stands (ten percent canopy coverage). In western North America, goshawks typically nest in coniferous forests dominated by ponderosa or lodgepole pine. They also commonly nest in mixed forests dominated by fir, Douglas-fir, cedar, spruce or larch. Northern goshawks may also nest in deciduous forests dominated by aspen, paper birch or willow. Foraging sites typically have higher canopy coverage, greater tree density and greater density of large trees than non-foraging sites, even where foraging sites have lower prey abundance (Beier and Drennan 1997). In Nevada, however, goshawks may commonly forage in open sagebrush-steppe adjacent to riparian aspen stands (Younk and Bechard 1992). Although they are generally

associated with remote habitats, goshawks may rarely forage in agricultural or suburban areas if they contain abundant prey (Palmer 1988). In Nevada, goshawks typically breed at elevations between 7,000 to 8,800 feet (Nevada Natural Heritage Program 2005). Habitat requirements during winter are poorly understood, but appear similar to breeding habitat requirements. Non-forested habitats may be used in proportion to their availability, while large tracts of mature forest are used preferentially (Widen 1989).

Nests are most commonly found near the bottom of moderate slopes and near water or dry openings (NatureServe 2005). Nest height ranges from 8 to 150 feet; one to eight nests may be reused in consecutive years (Squires and Reynolds 1997).

Goshawks feed opportunistically on a wide variety of vertebrates and rarely insects (NatureServe 2005). Mammals typically comprise 39 to 76 percent of goshawk diets, while birds comprise all but one percent of the remainder. In Nevada, goshawk diets studied by Younk and Bechard (1994) contained 67 percent mammals and 32 percent birds. Tree squirrels, ground squirrels and rabbits are the dominant mammalian prey; dominant avian prey includes galliformes (grouse, pheasants), corvids (jays, magpies), woodpeckers and robins (NatureServe 2005). Fledgling song birds are an important diet component when available.

Within the Sheep Allotment Complex, habitat for goshawks occurs at the upper elevation woodland areas, drainages, and spring habitats.

Ferruginous Hawk

In the Great Basin, ferruginous hawks primarily occupy sagebrush-steppe habitats, saltbush-greasewood shrublands, grasslands and peripheries of pinyon-juniper and other woodlands (Niemuth 1992, Bechard and Schmutz 1995, Houston 1995, Leary et al. 1998). They typically occupy rolling or rugged terrain, and generally avoid high elevations, narrow canyons and forest interiors (Palmer 1988). Open landscapes with moderate cover (greater than 50

percent) are preferred for nesting and foraging (Wakeley 1978, Bechard et al.1990, Leary et al. 1998), and they typically avoid dense or tall vegetation that reduces their ability to see prey (Howard and Wolfe 1976, Wakeley 1978, Schmutz 1987). Ferruginous hawks will also forage in pastures, but generally avoid areas of intensive agriculture or human activity (NatureServe 2005).

Ferruginous hawks nest in tall trees, willows or juniper, cliff ledges, river-cut banks, or sloped ground, and may also nest on artificial structures such as power poles. Nest site selection depends upon available substrates and surrounding land use. Ground nests are typically located far from human activities and on elevated landforms. Lone or peripheral trees are preferred over densely wooded areas when trees are selected as the nesting substrate (NatureServe 2005). In eastern Nevada, ferruginous hawks nest almost exclusively in Utah juniper (Perkins and Lindsey 1983).

Mammals are the primary prey during the breeding season, although birds, amphibians, reptiles, and insects also are taken. Jackrabbits dominate the diet in some areas, followed by ground squirrels and pocket gophers (Smith and Murphy 1978, Bechard and Schmutz 1995). Populations feeding on jackrabbits appear to fluctuate cyclically with their prey (Bechard and Schmutz 1995). Ferruginous hawks in areas with high prairie dog densities depend heavily on this species.

Ferruginous hawks within the Sheep Allotment Complex nest along the ecotone of the pinyon-juniper and sagebrush vegetation on the benches. Foraging is primarily in the sagebrush and salt desert shrub habitats.

The State conservation goals for ferruginous hawk are:

- to maintain stable or increasing populations of ferruginous hawks throughout their present range in northern Nevada;

- within the nesting range, maintain isolated mature Utah juniper trees along the ecotone between pinyon-juniper and sagebrush habitats; and
- implement livestock grazing management that would promote a healthy, diverse native forb and white sage component in all valley sagebrush habitats.

Swainson's Hawk

Swainson's hawks breed and winter in sagebrush-steppe, grassland and some cultivated habitats, often containing scattered trees such as juniper or aspen (American Ornithologists' Union 1983, Maser et al. 1994). In Nevada, Swainson's hawks typically breed at elevations between 3,900 to 7,200 feet (Nevada Natural Heritage Program 2005).

Swainson's hawks typically nest in solitary trees, bushes or small groves, and occasionally on rock ledges. They commonly occupy abandoned corvid (crow, magpie) nests, and readily nest in shelterbelts and similar situations produced by humans (Gilmer and Stewart 1984). In the Great Basin, junipers are more commonly used for nesting than riparian trees (Biosystems Analysis, Inc. 1989).

Vertebrates dominate Swainson's hawk diets during the breeding season; young ground squirrels and pocket gophers are the primary prey at this time (NatureServe 2005). Invertebrates are commonly consumed, particularly grasshoppers and crickets. Non-breeders may also consume more insects in summer. Depending on availability, Swainson's hawks will also eat other small mammals, snakes, lizards, birds, amphibians and carrion.

Swainson's hawks are open-country birds in Nevada and in the Sheep Allotment Complex. While not common, this species has been observed in the salt desert shrub and sagebrush communities.

Prairie Falcon

Prairie falcons breed primarily in open habitats, particularly grasslands, shrub-steppe and alpine areas (American Ornithologists' Union 1983). They may also nest near agriculture, riparian areas and wetlands (NatureServe 2005). Falcons typically nest on rocky cliffs or steep embankments, in well-sheltered ledges or cliff potholes 30 to more than 300 feet high. When suitable cliff habitat is unavailable for nesting, trees, power lines, buildings, and caves may be used, as well as abandoned nests constructed by ravens, hawks and eagles. Falcons commonly change nest sites within territories in successive years (Palmer 1988).

Prey species abundance is the most important characteristic associated with nest site preference (Neel 1999). Populations in prey-rich areas may be limited by a scarcity of suitable nest sites; artificial structures and artificial excavations into existing cliffs are readily accepted by breeding falcons in these areas (Cade 1982, Evans 1982).

In Nevada, prairie falcons feed primarily on Townsend's ground squirrels (Neel 1999). They will also feed opportunistically on mammals, lizards and birds, generally up to the size of quail and rabbits (NatureServe 2005). Large insects are occasionally eaten, especially by juveniles. In winter, falcons often take horned larks on fields of winter wheat. Prairie falcons usually capture their prey on or near the ground; they may also rapidly pursue birds in flight (Palmer 1988).

This species has been observed nesting in the Sheep Allotment Complex on cliffs and rock ledges. Foraging occurs over the sagebrush and salt desert shrub communities.

Peregrine Falcon

Peregrine falcons will breed, winter, and migrate in a wide variety of habitats, with deserts, tropical forests, and mountains above 12,500 feet the only major exceptions (NatureServe 2005). While they typically nest on cliffs near water, they will occasionally nest in tree branches, cavities or artificial structures such as buildings (White et al.

2002). They may winter in open-relief habitat devoid of cliffs, including rangelands, wetlands, river valleys and lake shores. In Nevada, peregrines typically breed at elevations between 2,000 to 6,000 feet (Nevada Natural Heritage Program 2005).

Peregrines typically nest on cliffs ranging from about 25 to 1,300 feet high; cliffs 150 to 650 feet high are preferred (White et al. 2002). Peregrines typically choose natural ledges and fissures in the cliff face as their nesting sites; human-made potholes dug into cliffs may also be accepted as nest sites (NatureServe 2005). Cliffs and other tall features are also important foraging perches in the winter months and during migration. Pairs nest at traditional sites year after year, and are often fidelic to winter foraging sites as well (White et al. 2002).

Birds comprise 77 to 99 percent of peregrine diets (Sherrod 1983). Avian prey species may range in size from hummingbirds to sandhill cranes, and may include 2,000 species worldwide (White et al. 2002). Pigeons, doves, and waterbirds are most frequently chosen as prey. Small mammals (bats, microtines, ground squirrels and rats) are occasionally taken, and very rarely amphibians, fish, insects and carrion.

Peregrine falcons were known to nest in the area as late as 1960. This historic peregrine falcon use area was designated as the Salt Lake ACEC in the Wells RMP (BLM 1983) to maintain the character of this area. Peregrine falcons are transients that are observed annually during the fall migration in the Goshute Mountains. However, there currently are no documented active nesting areas within the Sheep Complex Allotment.

Short-eared Owl

Short-eared owls breed in open country including grasslands, marshes, low shrublands and hayfields with abundant small mammal populations (Holt and Leasure 1993). They may also hunt in agricultural fields in winter. Size requirements for potential habitat are often 100 acres or larger (NatureServe 2005).

Nest sites vary with habitat type, but are often found in patches of tall, dense vegetation such as bulrush or on hilltops slightly elevated from the rest of the habitat (Holt and Leasure 1993). Short-eared owls may benefit from ecotones, where protected nest sites with dense shrub cover are adjacent to the wetland and grassland areas most suitable for foraging (NatureServe 2005). Nests are placed on the ground.

Small mammals, particularly voles, are the dominant prey of short-eared owls (Holt and Leasure 1993). These owls will also occasionally prey on passerines and insects (Erlich et al. 1988).

The mixture of low sagebrush habitats and salt desert shrub provide suitable habitat for this species within the Sheep Allotment Complex.

Long-eared Owl

Long-eared owls are most typically found along ecotones, as they forage in open habitats with abundant mammalian prey and roost in dense vegetation with protective cover (Marks et al. 1994). Foraging habitat may include grasslands, shrublands, deserts, forest openings, wetlands or farmlands, while roosting habitat may include stands of willows, cottonwoods, junipers, palo verde, saltcedar (tamarisk), coniferous or deciduous forests. Elevations range from near sea level to greater than 6,500 feet. The same tree groves are often used by long-eared owls for roosting in both the breeding and winter seasons (Wijnandts 1984), and communal roosts may form in preferred winter habitats.

Long-eared owls nest in large trees (nests four to 30 feet high and typically mid-height in tree), in groves greater than 30 feet wide (Marks et al. 1994). They do not build their own nests but are dependent on nests built and abandoned by corvids (magpies, crows) and diurnal raptors. Their productivity may thus be linked to the breeding population densities of these species. Long-eared owls rarely nest in squirrel nests, tree or cliff cavities, or on the ground. Nests are rarely reused by the same owl pair in subsequent years, but may be used by other pairs.

Long eared owls feed on a variety of small mammals ranging in mass from 0.5 ounces to three ounces (typically 0.8 to 1.5 ounces); voles predominate (Marks et al. 1994). Pocket mice and kangaroo rats are important prey in arid areas. Passerines and rarely reptiles are also eaten, but mammals comprise 93.5 to 99.9 percent of diet in North America. Long-eared owls typically hunt in open areas and will also forage below the canopy in open forests (Marks et al. 1994).

The combination of pinyon-juniper on the mountains and benches, sagebrush habitats on the benches, and salt desert shrub habitat in the valleys provides the variety of habitats uses by this species within the Sheep Allotment Complex.

Western Burrowing Owl

Burrowing owls typically inhabit open grasslands and savannas, and will sometimes nest in vacant lots near airports or human habitation (NatureServe 2005). They are found most often in areas with short vegetation, where they spend much of their time on the ground or on low perches such as fence posts or dirt mounds. Burrowing owls will very rarely dig their own burrows and depend on burrowing mammals to provide nest sites. They may nest in abandoned burrows excavated by prairie dogs, ground squirrels, foxes, marmots, badgers, and tortoises (Green and Anthony 1989). They may also nest in lava cavities in some areas (NatureServe 2005). Owls regularly modify and maintain their nest burrows, which may quickly become unsuitable for future nesting if abandoned. Availability of nest burrows appears to be of greater importance than any other habitat feature (NatureServe 2005).

Burrowing owls feed primarily on large insects and rodents, although they will also feed opportunistically on birds, reptiles and amphibians (NatureServe 2005). Prey is captured in flight or on the ground.

Burrowing owls have been documented in the Sheep Allotment Complex. The low sagebrush and black sagebrush communities, along with the

salt desert shrub communities, provide suitable habitat for this species within all the allotments in the Sheep Allotment Complex.

The State conservation goal for burrowing owl is to stabilize the current decreasing population trend of burrowing owls in Nevada.

Flammulated Owl

Flammulated owls are found in most of Nevada's forested ranges (McCallum 1994c). Although they are most commonly found in montane ponderosa pine forests, they may also breed in other cool, dry, coniferous habitats or aspen (McCallum 1994c). These owls appear to be absent from pine forests with high temperatures and humidity (McCallum 1994c). Breeding owls typically select forests which include structural diversity. Large, old trees and snags provide nesting cavities, open, old growth stands and the edges of clearings provide optimal foraging habitat for their arthropod prey, and thickets of dense saplings and/or shrubs provide optimal roosting habitat with greater cover from predators (McCallum 1994c). Survival and reproduction may be higher in older forests (Reynolds and Linkhart 1992), though this result may have been confounded by aspect or other factors (McCallum 1994c). Flammulated owls are typically found in the mid-elevational range (McCallum 1994c), and breed in Nevada at elevations between 5,800 and 6,000 feet (Nevada Natural Heritage Program 2005).

Tree cavities are required for nesting. Although natural cavities are also used, old woodpecker holes are preferred, particularly those excavated by pileated woodpeckers, northern flickers, and to a lesser extent sapsuckers. Flammulated owls also breed in artificial nest boxes (McCallum 1994c). Limited availability of nest cavities in optimal foraging habitat may limit reproduction for this and other cavity-nesting species. Flammulated owls have been recorded usurping nest cavities from bluebirds and flickers, and have been killed by flying squirrels which later usurped their nests (McCallum 1994c).

Nocturnal insects such as owl moths, other moths, beetles, bugs, crickets and grasshoppers

dominate the diet of flammulated owls, depending on availability (McCallum 1994c). Other arthropods such as spiders, centipedes and scorpions are less commonly taken (Erich et al. 1988). During especially cold periods when most insects are inactive, noctuid moths may be the only prey source available to flammulated owls (McCallum 1994c); stable and adequate populations of these moths are thus essential to owl population viability. Prey is captured from the foliage of canopy and understory shrubs, in the air, and on the ground (McCallum 1994c).

Potential habitat for this species occurs at the upper elevations in the conifer woodlands of the Goshute Mountains.

Sage Grouse

Within Nevada, sage grouse are presently distributed from the approximate center of Nevada northward, with the northeastern block of counties providing the most continuous habitat (Nevada Division of Wildlife [NDOW] 2000). The distribution of historic and current leks within Elko County suggests that sage grouse are found where sagebrush has dominated the landscape, historically or presently.

Sage grouse use a variety of habitats throughout the year. Breeding occurs at leks or strutting grounds, which are traditional, with the same lek sites used year after year (Scott 1942, Batterson and Morse 1948, Wiley 1978, Autenrieth 1981). Leks are generally small open areas from 0.2 to 12 acres in size, with either low or no sagebrush and surrounded by taller more dense sagebrush. The big sagebrush on the outskirts of the leks is necessary as a food source, for escape cover, for nesting females, and for loafing during the day (Patterson 1952, Gill 1965, Klebenow 1985).

Habitats used by pre-laying hens provide forbs that are high in calcium, phosphorus, and protein, all of which are necessary for egg production. These are generally sagebrush habitats with shrub cover less than 15 percent.

Nesting habitat is characterized by primarily Wyoming big sagebrush communities that have 15 to 38 percent canopy cover and a grass and

forb understory (Connelly et al. 1991, Gregg et al. 1994, Sveum et al. 1998a). Residual cover of grasses is also important (Klebenow 1969, Connelly et al. 1991, Gregg 1991, Gregg et al. 1994, Sveum et al. 1998a), ranging from 3 percent to 30 percent cover at successful nest sites. Reported shrub height at nest sites ranged from nine inches to 39 inches (Patterson 1952, Klebenow 1969, Autenrieth 1981, Gregg et al. 1994, Sveum et al. 1998a, Schroeder et al. 1999). Autenrieth (1981) found that a “bush providing an umbrella effect” was preferred.

When considered on a range-wide basis, optimum brood-rearing habitat consists of sagebrush stands that are 16 to 32 inches tall with a canopy cover of ten percent to 25 percent and an herbaceous understory of 15 percent grass canopy and ten percent forb canopy (this is consistent with nesting habitat). Ideally, this type of habitat would be found on at least 40 percent of the area that is considered brood-rearing habitat (Connelly et al. 2000). Hens with broods use sagebrush habitats that have less canopy cover (about 14 percent) than that provided in optimum nesting habitat (Martin 1970, Wallestad 1971), but need at least 15 percent cover of grasses and forbs (Sveum et al. 1998b). Optimum canopy cover within brood-rearing habitat is specific to each vegetation type and range-site potential. The habitats used during the first few weeks after hatching need to provide cover to conceal the chicks, but more importantly, to provide the nutritional requirements of this period of rapid development. Brood-rearing habitats that have a wide variety of plant species tend to provide a corresponding variety of insects that are important chick foods.

Summer habitat consists of sagebrush mixed with areas of wet meadows, riparian, or irrigated agricultural fields (Connelly et al. 2000). Sage grouse broods occupy a variety of habitats throughout the summer including sagebrush, wet meadows, farmland, and other irrigated areas adjacent to sage brush. In general, a sagebrush ecosystem with a good understory of grasses and forbs, and associated wet meadow areas, are essential for optimum habitat.

As upland habitats begin to dry up sage grouse broods move to more mesic wet meadows, where succulent grasses and insects are still available (Savage 1968, Schlatterer and Pyrah 1970, Oakleaf 1971, Neel 1980, Autenrieth 1981, Klebenow 1985, McAdoo et al. 1986). This can be especially important in drier years and during long drought periods.

Sage grouse form flocks as brood groups break up in early fall. As the meadows dry and frost leads to the drying and killing of forbs, the sage grouse diet shifts primarily to sagebrush leaves (Patterson 1952, Connelly and Markham 1983, Connelly et al. 1988, Wallestad 1975). As fall progresses toward winter, sage grouse move toward their winter ranges. Exact timing of this movement varies depending on the sage grouse population, geographic area, overall weather conditions, and snow depth. Sagebrush is essential for survival during the fall, winter, and early spring months.

Fall habitat in northeastern Nevada consists of mosaics of low-growing sagebrush (e.g., low sagebrush or black sagebrush) and big sagebrush (basin and Wyoming). As with the other seasons of the year, a mosaic of sagebrush vegetation (different species, different cover values, different height classes, etc.) provides the necessary food and cover requirements during the fall period. Studies in Elko County (Barrington and Back 1984) found that low sage was the preferred foraging and night roosting habitat during the fall. Sage grouse roosted in the big sagebrush types during the day, or during nights when winds were strong or the weather consisted of rain or snow.

Seasonal movements are related to severity of winter weather, topography, and vegetative cover (Beck 1977). Sagebrush canopy at sage grouse winter use sites can be highly variable (Patterson 1952, Eng and Schladweiler 1972, Wallestad et al. 1975, Beck 1977, Robertson 1991). However, sage grouse habitats must provide adequate amounts of sagebrush because their winter diet consists almost exclusively of sagebrush. It is crucial that sagebrush be exposed at least ten to 12 inches above snow level as this provides both

food and cover for wintering sage grouse (Barrington and Back 1984, Hupp and Braun 1989). Wallestad (1975) found that in Montana less than ten percent of the range was available when snow depth exceeded 12 inches. If snow covers the sagebrush, the birds will move to areas where sagebrush is exposed.

From the preceding discussion it is evident that although sage grouse are sagebrush obligates, they use a variety of habitats. Sagebrush habitats vary from low growing to taller sagebrush species, and from plant communities with sparse sagebrush cover to those with relatively high shrub cover. The amount of herbaceous cover also varies between seasonal habitats. There are also important seasonal habitats that do not have a sagebrush component (e.g., riparian meadows), but generally have sagebrush nearby. Sage grouse have also been observed in or near aspen stands and other areas with trees or very tall shrubs; however, these habitats are not used with any consistency, and they may be areas of high predation. The spatial arrangement of the habitats is also important. Leks generally have taller sagebrush cover nearby, and leks and nesting habitat generally need to be in close proximity (although instances of leks being separated from nesting habitat by long distances have been documented). Early brood habitat and nesting habitat should also be in close proximity to one another. Meadows need nearby sagebrush cover to provide the escape cover and loafing cover during summer. The variety of height and cover classes of sagebrush used for winter should also be intermixed.

Therefore, sage grouse habitat, when considered over the period of a year, consists of a variety of habitats or habitat conditions. A mosaic of these habitat types or conditions must be available on the landscape to provide all of the sage grouse seasonal cover and nutritional needs. The mere presence of sagebrush alone, especially uniform stands over vast acreages, should not be considered quality sage grouse habitat. These stands may provide some seasonal habitat, but cannot provide all the habitat needs throughout the year.

Two historical leks have been documented in the west portion of Boone Springs Allotment, along with nesting, winter, and summer habitat. Sage grouse have not been documented in the other allotments in the Sheep Allotment Complex. In 2005 BLM inventoried areas of high suitability for sage grouse lek occurrence within the Sheep Allotment Complex; no new leks were found and there was no attendance at the two historic leks in Boone Springs Allotment. One of the leks has never had birds identified on it and the other has only had birds identified on it one time, when three birds were observed in 2003 based on BLM helicopter survey data. Monitoring data collected by NDOW in 2006 on this lek complex resulted in a peak attendance of 22 sage grouse.

3.2.3.2 Environmental Consequences

3.2.3.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Raptors

No direct impacts to the raptor species were identified. Although golden eagles and ferruginous hawks occasionally nest on or near the ground, which would create potential for destruction of the nest by livestock, this would have to be considered a rare event, especially when sheep are the class of livestock and winter is the primary grazing season. Most of the nesting for these two species takes place on cliffs and rock outcrops; areas not used by livestock. Short-eared owls commonly nest on the ground under dense shrubs or in dense bulrush stands. Burrowing owls nest in burrows. Both of these species may have some vulnerability to trampling of the nest by livestock, especially short-eared owls that nest near riparian areas. The other raptors nest on ledges, cliffs, trees, and other locations not likely to be impacted directly by livestock grazing.

The use of the rangeland habitats within the allotments by golden eagles, ferruginous hawks, Swainson's hawks, and prairie falcons, is primarily for foraging – hunting for prey. The sagebrush vegetation on the foothills and

benches supports mountain cottontail and jackrabbit populations. Ground squirrel populations are also common in the sagebrush and transition zone between the sagebrush and salt desert shrub. Other prey, such as birds, snakes, and small rodents, are common within the allotments. Under this alternative, some reduction in the quality of habitat for prey species has occurred, especially in the sagebrush plant community where shrub density has been a cause of herbaceous plant decline due to competition and change in the fire ecology. The increase in shrub density and stature also makes it more difficult for raptors to capture prey. However, there is no evidence that the prey base is limiting the populations of these raptors. Similarly, some areas of white sage have also been impacted by historic grazing and have been replaced by non-native, invasive species and it is reasonable to assume that the prey base has declined. However, there has been no information that establishes a link between the prey base within the Sheep Allotment Complex and any regional raptor population trends. Even the data collected within the Sheep Allotment Complex (Goshute Mountains) by Hawkwatch International that shows regional population trends and includes resident as well as migrating individuals, does not provide insight into this issue.

For short-eared owls and long-eared owls, the indirect impacts through habitat alteration are more evident. These two species nest and forage in the riparian zones and meadows. Riparian areas that have been degraded through heavy to severe use, and when combined with soil compaction and loss of woody shrubs, the nesting habitat or the habitat for prey species for these two owl species would be degraded. The long-eared owl also uses the salt desert shrub community for foraging. Areas with abundant Indian ricegrass are likely to support kangaroo rats, which are important prey species for this owl. The impacts to riparian vegetation have been attributed primarily to wild horses, and under this alternative, impacts to the riparian habitats would continue.

Peregrine falcons were known to occur in the area, but have not been documented nesting in the area since 1960. Therefore, no direct or indirect impacts to this species are anticipated from this alternative.

Northern goshawks have been documented in the allotments. The high elevation woodlands represent potential habitat for this species. These upper elevation areas are not used by the sheep during winter. Consequently, no direct or indirect impacts to northern goshawk are anticipated from this alternative. Flammulated owls also use the high elevation conifer woodlands, and impacts to this species from the livestock grazing are not anticipated.

The loss of native vegetation, through conversion to non-native, invasive species, such as cheatgrass and halogeton, represents a loss of prey habitat. Under this alternative, additional acreage of habitat loss is anticipated through continued and expanded bedding areas and other areas of concentrated use, with associated loss of prey populations.

Winter use of the residual grasses also has the potential to reduce the quality of early spring habitat for the prey species. Under this alternative, monitoring has indicated that utilization of the dried grasses is on average only 35 percent, leaving sufficient cover for many of the mammal and bird prey species.

Potential impacts to grass vigor would reduce the amount of seed production each year. Because many of the birds, rodents, and insects depend on seeds for all or part of their diet, long-term changes in grass species abundance or production would reduce the quality of the habitat for the prey species by reducing the abundance of food.

Sage Grouse

Livestock use in the Boone Springs Allotment has been from November 15 to March 31, annually. As with some of the raptor species, sage grouse nest on the ground, but nesting is not usually initiated until April or May. Therefore, no direct

impacts in the way of nest mortality are anticipated under this alternative.

The livestock season of use corresponds with winter habitat use for sage grouse. During this time, sage grouse are on a diet consisting entirely of sagebrush leaves, with the exception of the end of March when sage grouse start to seek early emerging forbs. Due to the extent of the sagebrush community on Boone Spring Allotment, the browsing by sheep during this time is not likely to cause a shortage of forage for sage grouse.

Presence of the sheep and or the sheep herder in the vicinity of the leks during March may have an impact on the breeding activities. Sage grouse are likely to abandon the lek for the day if disturbed by large numbers of sheep, the herder, or the sheep dogs. This would only be a measurable impact if it occurred often enough to interfere with breeding or cause abandonment of the lek for the breeding season.

Winter use of the dormant grasses has the potential to remove residual cover within the sagebrush stands. This cover is considered an important component of sage grouse nesting habitat (Connelly et al. 2000). During this time of the year, sheep are primarily browsers, feeding on the leader growth of the shrubs. The monitoring data indicated that utilization of key grass species was less than 50 percent in most years and averaged about 35 percent. This would allow for residual cover in nesting habitat and the full spring growth of grasses would also be available in the nesting habitat due to the removal of livestock by March 31. Only limited grass growth occurs in these allotments before March 31, and sheep would still be foraging primarily on shrubs. Because the sheep would not be present when grass growth has produced substantial foliage, indirect impacts to sage grouse nesting habitat would be considered negligible.

Summer brood habitat, consisting of riparian vegetation adjacent to sagebrush cover may be the limiting factor for this allotment. Perkins Spring is the primary spring on this allotment on public land. The enclosure fence is in disrepair

and wild horse use of the spring has resulted in degradation of the habitat values for sage grouse. The higher elevation springs and associated drainages within the region represent potential brood habitat. However, impacts to the most of the riparian areas from hot season use by wild horses have degraded the spring areas. In addition, juniper encroachment of the sagebrush community at the higher elevations has altered this former sage grouse habitat to non-habitat status over large acreages.

3.2.3.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Raptors

Under this alternative, no direct impacts to raptors are anticipated (see Alternative 1 above). The proposed grazing system is anticipated to improve shrub and grass productivity through the implementation of rest rotation and Use Areas within the allotments. An increase in shrub and grass vigor would increase habitat quality for the prey species, which would indirectly improve foraging conditions for the raptors. The rest of the Use Areas would also provide additional residual grass cover for small mammal and bird prey species during the spring. Seed production would increase over time, increasing the food base for prey species. The permit terms and conditions would result in a reduction in the vegetation disturbance associated with bedding areas and sheep camps by limiting the creation of new sites and selecting regular use site.

The rest and rotation among the use areas would also slow the spread of non-native, invasive species and the loss of native habitat for the prey species.

The implementation of the spring enclosures has potential to substantially improve habitat quality for the short-eared and long-eared owls (both nesting and foraging habitats), as well as foraging habitat for most of the other raptor species. Establishment of willows and other woody shrubs and/or trees in these enclosures would eventually provide nesting sites for Swainson's hawk.

Improvement in the Indian ricegrass production would also increase kangaroo rat populations, which has potential to benefit long-eared owls.

The impact analysis for golden eagle, northern goshawk, ferruginous hawk, prairie falcon, peregrine falcon, burrowing owl, and flammulated owl would be similar to the analysis under Alternative 1.

Sage Grouse

Effects to sage grouse habitat under this alternative would be similar as those determined for Alternative 1 except for the reduction of impacts to the riparian area associated with the Perkins Spring enclosure within the Boone Springs Allotment. Improvement of the riparian vegetation would initially benefit sage grouse broods by providing a reliable source of green forbs and insects late in the summer. However, sage grouse prefer grazed meadows over und grazed meadows (Klebenow 1985) and build up of rank growth in the enclosures may result in less use by sage grouse. Similarly, if woody vegetation establishes and dominates the site, sage grouse use of the spring is anticipated to decline. Sage grouse prefer open meadows, rather than shrub dominated riparian vegetation. The other springs for which enclosures are proposed are not near known sage grouse brood habitat; therefore, these range improvements are not likely to benefit sage grouse.

The rest and rotation among the Use Areas would improve the quality of nesting habitat for sage grouse by increasing the amount of residual cover of grasses in nesting habitats.

Presence of the sheep and or the sheep herder in the vicinity of the leks during March (one out of three years) may have an impact on the breeding activities. Sage grouse are likely to abandon the lek for the day if disturbed by large numbers of sheep, the herder, or the sheep dogs. This would only be a measurable impact if it occurred often enough to interfere with breeding or cause abandonment of the lek for the breeding season.

3.2.3.2.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Raptors

Effects to raptors under this alternative would be similar as those determined under Alternative 2, except the benefits of the spring enclosures to short-eared and long-eared owls would not occur. The riparian areas would continue to be impacted by wild horses, and habitat improvement for the two owl species would not occur, or would occur at a much slower rate. Potential for improvement of shrub and grass productivity in the upland areas would occur. This should result in a long-term benefit to prey species and indirectly to raptors.

Sage Grouse

Improvement in the riparian vegetation and potential brood habitat at Perkins Spring would not occur under this alternative. Benefits to sage grouse broods would not be realized.

The rest and rotation among the use areas would improve nesting habitat as described under Alternative 2.

Presence of the sheep and or the sheep herder in the vicinity of the leks during March may have an impact on the breeding activities. Sage grouse are likely to abandon the lek for the day if disturbed by large numbers of sheep, the herder, or the sheep dogs. This would only be a measurable impact if it occurred often enough to interfere with breeding or cause abandonment of the lek for the breeding season.

3.2.3.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Raptors

Effects to raptors under this alternative would be similar as those determined under Alternative 2. Overall improvement in the shrub and grass

components of the habitat would be expected, with corresponding benefits to prey species.

The benefits to short-eared and long-eared owls would not occur, or not occur to the same extent as Alternative 2 because of the lack of protection of the riparian areas. While the reduction in wild horse numbers is expected to improve riparian habitat, there would still be some growing season and hot season use of these areas under this alternative.

Sage Grouse

Overall, the vegetation should respond to this alternative, improving conditions for nesting and brood rearing within the Boone Springs Allotment. The winter grazing has potential to remove herbaceous residual cover, but the dried grasses are not the main diet of sheep in winter.

The proposed grazing for the Boone Springs Allotment under this alternative would permit grazing in Use Area A (i.e., north and west of the highway) during the month of March one out of three years. This is the area in which the two leks, nesting, and most of the winter habitat occur. However, the seasonal restrictions for grazing within a quarter-mile of the leks in Boone Springs Allotment (Use Area A) during the sage grouse breeding period would mitigate potential disturbance of sage grouse at the leks. Sage grouse nesting generally does not begin until April or May; therefore, removal of the livestock by March 31 would eliminate disturbance impacts or reduction of growing season cover at nests under this grazing system. Reduction of residual cover of grasses could occur, but sheep would still be browsing shrubs until the soil temperature is sufficiently high to initiate grass growth.

Similarly, hatching does not occur until the end of May or early June, and livestock would be removed before this occurs.

Effects of the spring enclosure on the Boone Springs Allotment would be similar to those described for Alternative 2.

3.2.4 Conservation/Mitigation Recommendations and Residual Impacts

3.2.4.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

No conservation or mitigation recommendations for vegetation have been made for Alternative 1. This alternative represents the system which was evaluated in the allotment evaluation process and Alternative 2 was developed to make the necessary changes required to meet rangeland health standards and allotment objectives.

Residual impacts would include heavy to severe use of the spring areas and potential for non-native, invasive species to establish at the spring sites and displace the riparian vegetation.

Residual impacts under this alternative include non-achievement of rangeland health standards for the upland sites. Shrubs and grasses would continue to suffer the effects of early spring defoliation, and non-native, invasive species would continue to spread throughout the allotments where livestock concentrate and where wild horse impacts occur.

Residual impacts under this alternative include potential disruption of sage grouse breeding (if the two “leks” in Boone Springs Allotment become active) and removal of herbaceous cover prior to or during the sage grouse nesting season.

Residual impacts under this alternative include the continued threat of noxious and non-native, invasive species establishing as a result of livestock transportation of seeds.

Under this alternative, impacts to the riparian areas at springs would continue as an ongoing and residual impact, primarily to short-eared owls, long-eared owls, and sage grouse, but prey for other raptors would also be affected by the continuing degradation of the spring areas by wild horses.

3.2.4.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Under this alternative non-native, invasive species would continue to establish within the allotments, albeit at reduced rates than under the current management system. Mitigation for the impacts of the range improvements would include annual spring inspection of the trough areas and the perimeter of the enclosures to detect and subsequently treatment of noxious weeds and other non-native, invasive species. Early detection and treatment each year would prevent the undesirable species from completing their growth cycle, thus reducing the production of seeds that could be transported to other sites within or beyond the allotments. This mitigation measure should also be extended to sheep camp, sheep bedding, and watering sites used the previous winter.

A second mitigation measure would include seeding those areas receiving heavy use each year, as necessary, with desired perennial grass species such as Great Basin wildrye, crested wheatgrass, or other perennial grass that can better withstand the effects of concentrated livestock use at the water troughs and bedding areas. This would reduce the potential for non-native, invasive species to dominate the site, especially if annual treatment of noxious weeds is conducted.

Mitigation under this alternative would include annual evaluation of the non-enclosed springs to determine if rangeland health standards for riparian areas are being met and treatment, as necessary, of non-native, invasive species. Inspection of the areas near the troughs would also be necessary to ensure non-native, invasive species do not establish at these sites and then spread to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Mitigation under this alternative would include avoiding soil disturbance (from grazing, location

of water sources, and range improvements related construction) when the soils are moist which would reduce soil compaction. Locating water developments or concentrated use area on soils that are not as subject to compaction (such as gravelly soils), would reduce impacts.

Seasonal restrictions for grazing within a quarter-mile of the leks in Boone Springs Allotment (Use Area A) during the sage grouse breeding period would mitigate potential disturbance of sage grouse at the leks.

Residual impacts would include potential for non-native, invasive species to occur in areas of livestock concentration, such as bedding areas or at water sources. However, this potential would be less than under Alternative 1 due to the implementation of grazing Use Areas to move the livestock around the allotment and reduce repeated use of the same areas.

Residual impacts under this alternative include the continued threat of noxious and non-native, invasive species establishing as a result of livestock transportation of seeds.

Residual impacts to riparian vegetation under this alternative would be limited to the non-enclosed spring areas. Wild horse use of these areas and potential for non-native, invasive species to establish on these areas would continue.

Residual impacts would occur at the spring enclosure for sage grouse if the enclosure vegetation becomes shrub or tree dominated. The value of this area would decline for sage grouse. Mitigation would include occasional, short-term grazing or other shrub treatment to keep the riparian area at least partially as a meadow complex for sage grouse broods.

3.2.4.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Under this alternative non-native, invasive species would continue to establish at riparian areas associated with springs primarily as a result of wild horse use of these areas. Mitigation for the impacts would include annual inspections of the

spring areas and treatment of noxious weeds as appropriate.

Mitigation would also include annual inspection of the spring areas and treatment, as necessary, of non-native, invasive species.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Mitigation under this alternative would include avoiding soil disturbance (from grazing, location of water sources, and range improvements related construction) when the soils are moist which would reduce soil compaction. Locating water developments or concentrated use area on soils that are not as subject to compaction (such as gravelly soils), would reduce impacts.

Seasonal restrictions for no grazing within a quarter-mile of the leks in Boone Springs Allotment (Use Area A) during the sage grouse breeding period would mitigate potential disturbance of sage grouse at the leks.

Residual impacts would include heavy to severe use of the spring areas and potential for non-native, invasive species to establish at the spring sites and displace the riparian vegetation.

Residual impacts would include continued degradation of the spring areas, primarily by wild horses during the hot summer months, and spread of non-native, invasive species.

Under this alternative, impacts to the riparian areas at springs would continue as an ongoing and residual impact, primarily to short-eared owls, long-eared owls, and sage grouse, but prey for other raptors would also be affected by the continuing degradation of the spring areas by wild horses. Due to the proposed change in wild horse numbers, the impact would not be as great as under Alternative 1.

3.2.4.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative non-native, invasive species would continue to establish within the

allotments, albeit at reduced rates than under the current management system. Mitigation for noxious weeds and other non-native, invasive species would include annual spring inspection of the riparian areas to detect and subsequent treatment of noxious weeds and other non-native, invasive species. Early detection and treatment each year would prevent the undesirable species from completing their growth cycle, thus reducing the production of seeds that could be transported to other sites within or beyond the allotments. This mitigation measure should also be extended to sheep camp, sheep bedding, and watering sites used the previous winter.

A second mitigation measure would include seeding those areas receiving heavy use each year, as necessary, with desired perennial grass species such as Great Basin wildrye, crested wheatgrass, or other perennial grass that can better withstand the effects of concentrated livestock use at the bedding areas. This would reduce the potential for non-native, invasive species to dominate the site, especially if annual treatment of noxious weeds is conducted.

Mitigation under this alternative would include annual evaluation of the non-enclosed springs to determine if rangeland health standards for riparian areas are being met and treatment, as necessary, of non-native, invasive species. Inspection of the areas near the troughs would also be necessary to ensure non-native, invasive species do not establish at these sites and then spread to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Mitigation under this alternative would include avoiding soil disturbance (from grazing, and location of water hauling sites) when the soils are moist which would reduce soil compaction. Locating water hauling sites or concentrated use area on soils that are not as subject to compaction (such as gravelly soils), would reduce impacts.

Seasonal restrictions for no grazing within a quarter-mile of the leks in Boone Springs Allotment (Use Area A) during the sage grouse breeding period would mitigate potential disturbance of sage grouse at the leks.

Residual impacts to riparian vegetation under this alternative would occur at the non-enclosed spring areas. Wild horse use of these areas and potential for non-native, invasive species to establish on these areas would continue.

Residual impacts would include potential for non-native, invasive species to occur in areas of livestock concentration, such as bedding areas or at water hauling sites. However, this potential would be less than under Alternative 1 due to the implementation of grazing Use Areas to move the livestock around the allotment and reduce repeated use of the same areas.

3.2.5 Cumulative Effects

3.2.5.1 Past Actions

During the period from 1860 to 1940 the perennial native grasses were greatly reduced and sagebrush and other shrub species increased in dominance (Young et al. 1979). With these historic levels of livestock use, the time, duration, and intensity of grazing exceeded the ability of the plants (both grasses and some shrubs) to maintain plant vigor through the constant removal of photosynthetic tissue and growing points at all times of the year. Winterfat was a semi-shrub species especially susceptible to season-long grazing and much of the range formerly occupied by winterfat was occupied by halogeton, a non-native, invasive species. By 1890, shrubs dominated most of the western rangelands (Young et al. 1979). By the early 1900s, the forest preserves were established, which were precursors to the national forests. As these forest preserves were established, restrictions were placed over the nomadic sheep operations and some relief of grazing intensity began.

Most of the early range improvements implemented by the BLM were designed to increase livestock forage and stabilize soils and

actual results of these projects were mixed. Halogeton control was also an issue and crested wheatgrass, a non-native species was introduced as one means of replacing halogeton with a forage species. While there were benefits to prey species and sage grouse through the conversion from halogeton to perennial grasses, the non-native species and the monocultures that were produced had the immediate effect of creating non-habitat. As shrubs and native species established over time (30 or more years in many cases), the habitat values returned and many birds and small mammals, as well as sage grouse can be found in older seedings that have a mixture of sagebrush, native grasses and forbs, and crested wheatgrass.

In addition to the initial impact of grazing on the native grasses, a subtle but more profound and lasting effect of grazing was a change in the fire ecology of Great Basin rangelands. During the initial overstocking of the rangelands, grasses were grazed to the extent that there was insufficient fuel to carry lightning-ignited fires. In many instances the shrubs were too widely spaced for fires to burn large acreages. This reduction in natural fires allowed shrub species to increase in stature and density by eliminating the low to moderate intensity fires that formerly kept the rangeland open in more of a grass dominated or grass-shrub mixture. In the absence of these low to moderate fires, shrub dominance became common.

Cheatgrass, which was introduced in the late 1800s or early 1900s, began to expand into portions of the low elevation, low precipitation zone vegetation. The presence of this species in these plant communities set the stage for conversion to annual grasslands in many sagebrush and salt desert shrub communities.

By the 1960s the sagebrush shrub density was sufficient that the fine fuels (native grasses) were no longer needed to carry fires in much of the Great Basin rangelands, and large, shrub-fueled fires began to occur. Due to the intensity of these fires, most of the perennial grass species were destroyed and cheatgrass, which was present in the understory in limited amounts responded by

dominating the burned area. This annual species has increased the frequency of fires where it exists, which prevents shrubs from re-establishing. Therefore, livestock grazing, in combination with introduced species and vegetation treatments, have resulted in an altered fire regime. First increasing the fire return interval, allowing shrubs to increase in density and extent and allowing cheatgrass to establish, followed by decreased fire return intervals that allow cheatgrass to persist and dominate the sites.

Initially the shrub build up provided habitat for sage grouse, but as the understory grasses and forbs declined and shrubs dominated, the critical nesting, pre-laying, and early brood habitats declined in abundance. The fires that followed eliminated sage grouse habitat, as well as habitat for the prey species on which the raptors depend.

In the salt desert shrub vegetation, the fire return interval is quite long – over 100 years – as these sites are less productive and fuel loading does not generally get high enough to carry fires except in extreme conditions. However, the wide interspaces between the shrubs and the perennial bunch grasses provide sites for cheatgrass to establish. Once cheatgrass begins to fill in the interspaces, the continuity of fuels is increased and the potential for these sites increases. Once the fire has occurred, cheatgrass becomes even more abundant and the fire return interval is on the order of 10 years or less. This does not allow shrubs to reestablish on the side, turning the area into an annual grassland.

As indicated in the Allotment Evaluation (BLM 2000a) there have been at least 61 wildland fires documented on the Sheep Allotment Complex. However, these fires account for about one percent of the acreage within this complex. Fires that occurred in 1999, and more recently in 2003, are shown on **Map 3-4**. Approximately half of these fires occurred in the low sagebrush/salt desert shrub community. This community is not fire adapted, and the spread of cheatgrass into this community is one possible reason for the increase in wildland fire on the subject allotments.

The lack of fire during the mid-1900s up until the more recent increase in fires, allowed pinyon-juniper woodlands to expand into the sagebrush communities, especially the black sagebrush community. This expansion reduced the amount of sage grouse habitat, primarily along the foothills and benches. The expansion of the woodland community in canyons and along drainages also created unsuitable conditions for sage grouse to use these areas as summer brood habitat. The woodland is raptor habitat and sage grouse generally avoid wooded areas. The loss of sagebrush-bunchgrass communities also had potential to reduce cottontail and jackrabbit populations, two primary prey species for the larger raptors. Consequently, there was an increase in nesting habitat for some species of raptors, but a decline in foraging habitat for other raptor species.

In areas where sagebrush was not being replaced by pinyon-juniper, the competition between shrubs and grasses created additional stress on the grass plants, as the shrubs increased in density and stature. The ability of shrubs to acquire soil moisture and nutrients is greater than the ability of grasses. Where grazing adds to the stress on grasses by reducing vigor and root growth, grass production is expected to be less. This has had an overall impact on the productivity of many range sites, which has likely resulted in less prey species through lower production of herbaceous forage and decreased seed abundance. Similarly, this loss of various age classes and structure of the sagebrush community has resulted in less pre-laying, nesting, and early brood habitat for sage grouse. Periodic treatment of the vegetation, combined with seeding native perennial grasses when necessary, would offset the change in fire ecology that has eliminated the low to moderate intensity fires that kept the sagebrush community productive.

As the non-native, invasive species, especially the annual grasses and forbs, become established on the allotments, the risk of developing a fire regime that favors these annual species increases. Any actions that create

favorable conditions for establishment or promote seed dispersal contribute to this threat.

Although the construction of the railroad occurred before many of the non-native, invasive species were introduced to the Great Basin, the construction did create disturbance that allowed native weedy species to establish and dominate the railroad right-of-way, borrow pits, gravel pits, and the railroad stations, like Shafter (water supply stops for the old steam engines). The Western Pacific railway currently extends through the north east portion of the Leppy Hills Allotment. The trains, especially the old steam engines, but even the modern day trains, cause wildland fire ignitions. These fires facilitate the establishment of cheatgrass in the salt desert shrub and sagebrush communities.

Similarly, Interstate 80 and Alternate Route 93 are travel ways for non-native, invasive species and increase the potential for man-caused fire ignitions. Only the Sugarloaf, Ferber Flat, and Utah/Nevada South allotments do not have one or the other of these highways within or adjacent to their borders. These two major highways also fragment the habitat by creating a physical barrier that may effect sage grouse movements.

The Graymont Western, U.S., Inc. currently operates the Pilot Peak Quarry (limestone) and has been conducting exploration drilling in the Leppy Hills Allotment. Approximately 520 acres of disturbance are associated with these activities. Most of this disturbance is in the salt desert shrub, sagebrush-bunchgrass, and pinyon-juniper vegetation.

The build up of wild horse populations within the HMAs has also contributed to the current condition of the springs and upland vegetation.

Military flyovers of the allotments in this complex have been common for many years. The impact to nesting raptors or nesting sage grouse is unknown. However, the sonic booms are relatively infrequent for any given location in the allotments, and therefore, are not likely to cause nest abandonment or egg breakage.

3.2.5.2 Present Actions

Impacts of the pre-MUD grazing were detailed in the Sheep Allotment Complex Evaluation (BLM 2000a) and summarized in the analysis for Alternative 1 above. Dispersed recreation, including hunting, OHV use, and BLM-authorized OHV organized events are responsible for the creation of new trails, which become pathways for non-native, invasive species. Creation of the trails impacts the established flora by physically damaging the plants, creating soil erosion, and creating competition between the native plants and the non-native, invasive species. These two land uses contributed to not meeting some of the rangeland health standards and some allotment-specific objectives, and impacts would continue.

Recent drought has also affected the productivity of the plants. Minimal leader growth on the shrubs was observed in recent years, resulting in voluntary non-use and BLM emergency drought closures of the allotments.

Wildlife habitat and the use of the habitat by wildlife were not identified in the allotment evaluation as contributing to the non-achievement of allotment objectives or rangeland health standards. In contrast, the use of certain habitats by wild horses did contribute to the non-achievement of objectives and standards.

The use of the Goshute Mountain monitoring site by Hawkwatch International has been subject to the conditions required for WSAs and has had minimal impact on the vegetation, raptors, or prey species. On balance, the cumulative effects of the proposed action and the past present and reasonably foreseeable future actions do not result in significant impacts to the result in significant impacts to the human environment.

3.2.5.3 Reasonably Foreseeable Future Actions

As discussed in Section 2.7.1.2, the reasonably foreseeable future actions for the Sheep Allotment Complex include continuation of livestock grazing, fire suppression and rehabilitation, recreational uses, land sales and subsequent

changes in land use, right-of-way fencing, OHV events, and mineral exploration.

The continuation of grazing under Alternatives 2, 3, or 4 would be anticipated to improve the general condition of the range. Alternative 3 would provide for less improvement of the springs and riparian vegetation than Alternatives 2 and 4. Non-native, invasive species would be anticipated to continue to be present in the allotments, but the rate of increase is likely to be less under Alternative 2.

Overall improvement of the habitat for sage grouse and raptor prey species is anticipated under Alternatives 2, 3, and 4. However, improvement of riparian areas would be greatest under Alternative 2.

Fire suppression and burned area emergency rehabilitation are likely to continue. This is likely to reduce the changes in the plant community due to large fires (i.e., fire suppression should limit the size of the fires), but also result in somewhat less diverse communities in the short-term (i.e., the fire rehabilitation seed mixes generally only include a few species).

The acreage of habitat for prey species and raptor foraging is likely to be reduced by expansion of human occupation of private lands within the allotments near West Wendover, Nevada. These same allotments are likely to receive increased recreational use, which has potential to increase the abundance of non-native, invasive species.

Temporary loss of habitat due to mineral exploration and temporary and permanent loss of habitat due to mine development could reduce prey species and sage grouse populations, depending on the location and extent of the actions.

The incremental impact of the proposed changes in grazing use and construction of range improvements would not result in significant cumulative adverse effects. Under all alternatives, environmental conditions would largely improve and the potential losses of habitat resulting from mining exploration and land use changes around

Wendover would be offset. The impacts of fragmentation of habitat associated with the potential fencing of the highway ROW and increased OHV use would likewise be offset by the overall improvement of most if not all habitat conditions by the proposed action or alternatives.

The conversion of habitat and redistribution of habitat components resulting from fire suppression and fire rehabilitation activities would complement the improvements anticipated from implementing the proposed action or alternatives as the negative effects of wildfire are mitigated. The cumulative impact of constructing the proposed essential range improvements would be positive as implementation of SOPs contained in Appendix C would reduce or eliminate several potential impacts.

On balance, the cumulative effects of the proposed action or alternatives and the past, present, and reasonably foreseeable future actions to not result in significant impacts to the human environment.

3.3 Big Springs Allotment

3.3.1 Vegetation Resources (Including Non-native, Invasive Species)

3.3.1.1 Affected Environment

The management framework with respect to vegetation and non-native, invasive species is provided in **Appendix B**.

Vegetation types are shown on **Map 3-6, Appendix A**. Three mountain ranges (Wood Hills, Pequop Mountains, and Toano/Goshute Mountains) which occur in the Big Springs Allotment are dominated by pinyon-juniper at the lower to upper elevations. On the Pequop and Toano/Goshute Mountains, white fir, limber pine, bristlecone pine, Englemann spruce, and curleaf mountain mahogany are present. The windswept ridges are occupied by either low sagebrush-bunchgrass or black sagebrush-bunchgrass, depending on the soil types. Mountain big sagebrush and other mountain shrubs are common in areas where pinyon-juniper has not

encroached. The lower benches and foothills are primarily Wyoming big sagebrush-bunchgrass, but much of this potential plant community has either been replaced by pinyon-juniper or pinyon-juniper is present and increasing. The salt desert shrub community is common on the valley bottoms.

A noxious weed inventory of the Big Springs Allotment was conducted by the BLM in 1998. The survey has been supplemented with additional observations between 1998 and 2004. The following noxious weeds and invasive species occur within the allotment:

- Hoary cress;
- Scotch thistle;
- Canada thistle;
- Bull thistle
- Russian thistle;
- Halogeton;
- Blue mustard;
- Burr buttercup;
- Tumble mustard; and
- Cheatgrass.

Many of the non-native, invasive species occur only in small patches scattered around the allotment. Halogeton, a plant poisonous to livestock, has become less abundant in recent years. However, extensive areas of cheatgrass, blue mustard, burr buttercup, and tumble mustard occur within the allotment.

Relatively dense stands of cheatgrass are present on the east side of the Pequop Mountains, and a dense stand of cheatgrass occurs mixed with native vegetation just north of Interstate 80, associated with the East (Upper) Beacon Spring/Reservoir. Cheatgrass is also present in Payne Basin just south of Interstate 80 in the vicinity of Nanny Spring, and in an area on the east bench of the Pequop Mountains, just south of the Big Springs Ranch. These areas dominated by cheatgrass are likely the result of previous wildland fires, livestock grazing, and altered fire regimes.

Blue mustard has established on highly disturbed areas associated with stockwater locations,

corrals, and other areas of livestock concentration. This species is also common in the undisturbed shrub ranges in Goshute Valley. Tumble mustard is also common in the desert shrub ranges in Goshute Valley and in the area of the east Pequop bench that burned in the early 1990s.

There are a variety of old water developments, troughs, and wild horse traps scattered throughout the allotments. Some are located on private lands and some are on public lands. Due to their age, many of these developments are considered cultural resources.

3.3.1.2 Environmental Consequences

The Big Springs Allotments are used by cow/calf pairs, dry cows, and yearlings, wild horses, and wildlife. Grazing by domestic livestock is year-long within the allotments, but seasonal within any given pasture. The wild horses and wildlife are also present throughout the entire year. Cows are primarily grazers, feeding on the herbaceous forage during the growing season and dry grasses in the fall/winter. However, cows use browse (woody vegetation) during the summer, fall, and winter, transitioning to a mostly herbaceous diet in spring and early summer.

Although the term “range improvements” encompasses many types of actions, the range improvements proposed for the Big Springs Allotments include: fences, spring/riparian enclosures, spring developments, and noxious weed treatments.

3.3.1.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

The previous grazing permits for the Big Springs Allotment provided for a total of 21,983 AUMs apportioned as 16,598 AUMs within the East Big Springs grazing area and 5,385 AUMs within the West Big Springs grazing area. The allotment was under a year-long grazing system, with use distributed throughout the allotment by season.

Actual use during the period 1987 to 1999 for West Big Spring Allotment averaged 2,730 AUM, with a low of 458 AUMs and a high of 4,402 AUMS. For the East Big Springs Allotment the actual use ranged from 505 AUMs to 11,929 AUMS, with an average of 7,770 AUMs.

Plant Productivity

Under this alternative, four pastures would continue to receive fall/winter/spring use: Independence, East Pequop Bench, Shafter, and Collar and Elbow. Actual use varied widely among years in each of these pastures, with a high use as much as ten times the reported low use (BLM 2000b, Big Springs Allotment Evaluation). Utilization at Key Areas exceeded 60 percent of key species in some years, and use pattern mapping indicated that in the Independence Pasture, moderate to heavy use occurred in the areas closet to water. These areas were used by livestock, wild horses, and wildlife and had year-round access to water. Similarly, the areas of highest use in the East Pequop Bench and Shafter pastures have been associated with water developments.

Under this alternative, it is anticipated that these same distribution and use patterns would continue in these fall/winter/spring use pastures. With continued moderate to heavy use in the areas adjacent to water sources, the potential is high for impacts to both grasses and shrubs in these areas. High levels of spring use after months of winter use would remove the growing points from the shrubs and grasses, depleting root reserves over time. The extent of the impact would depend on how much growing season moisture remains after the livestock are removed, and how much use occurs in these areas by wild horses and wildlife during the growing season. The remainder of the pastures, generally more than 50 percent of the pasture acreage, receives slight and light use. The bench areas in these pastures consist primarily of sagebrush-bunchgrass. Due to the high levels of sagebrush, competition between the sagebrush and the grasses is expected to result in a long-term suppression of grass biomass, even in the absence of heavy grazing.

The Holborn, East Squaw Creek, Payne, Six Mile, and Railroad Field pastures are generally used in spring and summer. Actual use has varied considerably among years in these pastures, by as much as a ten-fold difference between the highest and lowest actual use in Railroad Field. Use pattern mapping indicated that areas of moderate to heavy use occurred near the water sources. These pastures have received some rest from grazing which would be expected to facilitate recovery of root systems in some years.

Under this alternative, the heavy use areas are anticipated to experience a decline in grass plant vigor with a long-term decline in grass biomass. In areas of heavy browsing, a reduction in shrub productivity would be a long-term impact.

The North Pequop Mountain and Collar and Elbow pastures receive spring or summer to fall use. Utilization at Key Areas rarely exceeded 60 percent on key species in both of these pastures, except for use of white sage in Loray Canyon in Collar and Elbow Pasture (BLM 2000). Under this alternative, the repeated removal of herbage and growing points of white sage in Loray Canyon during the growing season, is anticipated to result in a long-term decline in plant vigor and biomass.

The Windmill and North of Home Ranch Field pastures receive variable periods and seasons of use. Impacts to grass and shrubs in these pastures would not likely create measurable effects as the plants are provided with opportunity to recover from herbivory. However, as with the other pastures in this allotment, the heavy use areas are likely to show some decline in vigor and production over time.

Range Improvements

The primary impact of the existing range improvements on vegetation under this alternative would be the continued concentration of livestock and wild horses at water sources. The instances of heavy and severe utilization were associated with the water sources – springs, seeps, troughs, wells, and water tank locations. The repeated use of the shrubs and grasses, especially at the heavy to severe level, results in

very little replenishment of the carbohydrate reserves, which leads to decreased plant vigor and health over time. Repeated browsing of the shrubs removes the current year's growth and associated growing points, which stunts the plant growth and reduces productivity.

Another impact from the range improvements is the establishment of trails by livestock along fences and radiating out from existing water sources. The repeated mechanical action or hoof action along these trails destroys the vegetation and creates suitable sites for non-native invasive species to establish.

Non-Native, Invasive Species

The concentration of livestock at the water sources and riparian areas under this alternative would result in increased establishment and spread of non-native, invasive species. Initially, increases in the blue mustard, tumble mustard, cheatgrass, Russian thistle and halogeton are anticipated under this alternative. However, the noxious weeds are also present in the allotment and they are likely to establish on these sites and displace the annual weeds.

3.3.1.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

The grazing system proposed in the MUD is described in Section 2.4.2. The permitted livestock use of 17,538 AUMs under this alternative represents a reduction of 4,445 AUMs from Alternative 1 (based on AUMs included from the land exchange). However, the interim grazing plan would be initiated with only 13,601 AUMs, or a reduction of over 8,382 AUMs from Alternative 1.

Period of use for the two allotments would be year-long with use spread out by pastures and seasons over the year (**Table 2-23 and Table 2-25**). Grazing within pastures would be by Use Areas, and within the individual pastures, the Use Areas would have specified periods of use and permit the implementation of deferred rotation systems for specific Use Areas. Wild horse AUMs

would be reduced to 672 AUMs, or a reduction of 96 AUMs.

Plant Productivity

West Big Springs Allotment

The interim grazing system is designed to minimize duration and intensity of grazing, especially in riparian areas. Livestock use would be managed according to the attainment of the resource objectives and construction of essential projects. The interim grazing system would reduce the likelihood of short term exceedences in plant utilization, and plant vigor would be improved over Alternative 1.

The proposed final grazing system under this alternative divides the Independence Valley Pasture into three major Use Areas. The use in these areas is set to rotate each year, except for the Boxcar Well Use Area, which would always receive late fall/winter use (December 1 to March 31). The other two Use Areas rotate between spring/early summer use (April 1 to June 30) and late summer/fall/winter/early spring use (September 1 to March 31). There are several minor use areas within the two major Use Areas, which are defined by water sources (**Table 2-24**). Under this alternative, grazing so as to not exceed the utilization objectives along with sufficient rest between the spring/early summer use the first year and the late summer/fall/winter/early spring use the second year, would allow for shrubs and grasses to recover from the spring/early summer defoliation. The winter Use Area would be used the same time each year. The grasses would be dormant during this period of time and cows do not normally make much use of sagebrush, the major shrub in this Use Area. Winterfat is also present in this Use Area. Grazing so as not to exceed the utilization objective along with dormant season use is anticipated to have minimal impact on this half shrub. Impacts to grasses and shrubs are anticipated to be minimal. Due to the lack of fences between Use Areas, there is opportunity for livestock to drift out of the winter area if water becomes available in the other Use Areas due to precipitation events. Such drift would result in

increased use of previously used areas, with potential to exceed short-term objectives.

The Holborn Pasture would rotate between early use (May 15 to September 30) for two years and late use (July 1 to September 30) for two years. The early use would be late enough in the season so as to not defoliate the initial growth or growing points, which would allow carbohydrate production prior to grazing. During the rest of the growing season, elevated growing points could be removed, depending on the utilization level. The off date would allow for the cool season grass plants to experience fall growth and complete root growth and replacement. Some reduction in plant vigor would be expected due to the herbivory from spring into the dormant season, but the magnitude of this impact would depend on the intensity (utilization) level. At slight to light utilization, the effect would be minimal. At moderate to heavy utilization, some reduction in plant vigor is anticipated. However, this effect is likely to be offset by delaying grazing until the dormant season the following two years when the grasses would experience no early season use and there would be opportunity for fall season regrowth.

The effect on shrubs is likely to be greater than on grasses. Use during the late season (July 1 to September 30) when the grasses are dormant is likely to result in shrub use, as the growing shrub leaders would be more attractive. However, sagebrush is the major shrub in this pasture and cows do not generally use much sagebrush. Therefore, impacts to shrubs are anticipated to be minimal.

The effects on grasses would be similar in the North Pequop Mountain Pasture as are anticipated to occur in the Holborn Pasture. The two Use Areas within North Pequop Mountain Pasture would rotate between two years of early use (May 15 to September 30) and two years of late use (August 1 to September 30). Impacts to grasses over the long-term would be minimal. However, the North Pequop Mountain Pasture includes a mixture of sagebrush and bitterbrush. Livestock use of bitterbrush is likely to occur during both periods of use. Grazing so as not to

exceed the utilization objectives along with the deferred rotation system is anticipated to have minimal impact on this shrub.

East Big Springs Allotment

The interim grazing plan alternates deferment and rotation each year, in contrast to the final grazing system that repeats the same season of use for two years and then changes season of use for two years. The interim system depends more on riding and herding to maintain livestock in scheduled use areas. If livestock use approaches objective use levels, livestock would be moved. Once essential range improvements are completed, riding and herding would continue, but to a lesser extent.

The proposed final grazing system under this alternative uses a deferred rotation system to rotate growing season rest for the grasses and shrubs. The large pastures are divided up into Use Areas to address issues of duration and intensity of herbivory.

The Shafter Pasture would always serve as the winter/early spring pasture with a yearly season of use of October 1 to April 15 (Table 2-26). Two Use Areas would be used each year to reduce the duration that livestock spend in any one area. When wet years occur, a third Use Area on the west side of the pasture would be used for late winter/early spring use. This third Use Area has insufficient water in normal or dry years to facilitate grazing. Due to the utilization level standards associated with this pasture, the movement between Use Areas, and the complete rest each year during the late spring through summer, effects of winter and spring defoliation of the grasses and shrubs is anticipated to be offset by the growing season rest. Duration would be controlled by the movement between Use Areas and utilization levels would be used to determine when livestock need to be moved. The use of the third Use Area in wet years would provide some winter relief in the other two Use Areas within this pasture.

Grazing in the East Pequop Bench Pasture would be deferred rotation during the growing season combined with late summer and fall use. The

grazing would be divided among four Use Areas (**Table 2-26**) with grazing occurring during early spring (March 1 to May 15) in two Use Areas, during spring/summer (May 1 to July 15) in the other two Use Areas, and during fall/early winter (September 1 to December 31) in the seeding that also received early spring use, in years one and two. During years three and four, the dates would be reversed, with the two early spring Use Areas also receiving fall/early winter use and the other two Use Areas receiving spring/summer use. The system would allow sufficient growing season rest following the early spring use for grass plants to continue the growth cycle, following the initial defoliation. Fall and early winter use of these same areas would reduce the amount of fall root development and bud development from fall growth for two years, but the plants would have time to recover the following two years when spring and fall/winter use would not occur. The spring/summer use areas would have early season and fall regrowth periods to provide for growth cycle and root growth and replacement. Therefore, effects to grass plants would not be expected to result in long-term declines in grass productivity. The effects of fall/early winter use of shrubs would depend on the intensity of use. At slight to light utilization, the effect would be minimal. At moderate to heavy utilization, some reduction in plant vigor is anticipated. However, this effect is likely to be offset by having no early season use or fall use the following two years, and there would be opportunity for fall season regrowth.

Payne Basin would receive two years of growing season use (May 16 to September 30) followed by two years of summer dormant season (July 1 to September 30) use. Impacts under this system would be dependent on the intensity of use, as the duration and time of grazing occur during the growing season two out of four years. During the summer dormant season use, the utilization level on key species would be 50 percent. Both of these grazing periods allow for the fall regrowth/recovery period. Effects to shrubs (especially bitterbrush) are anticipated to occur under this system due to the timing of herbivory every year in the hot season, but effects would be

minimal if the 40 and 50 percent utilization levels are not exceeded. Effects to grasses would also be minimal under this system due to the opportunity for the grasses to conduct growing season carbohydrate production during two out of four years and fall regrowth every year.

Grazing in Six Mile Canyon would be defined annually as determined by water availability. When water is available, this pasture would be used as an alternative to Payne Basin. Therefore, it is anticipated that the use would be early spring use in the years that use takes place, and livestock would be moved to Payne Basin when the water was no longer available. Utilization levels on key species would be 40 percent during the growing season use, if used during the critical growing season every year.

Grazing would be permitted in East Squaw Creek Pasture from April 1 to October 15 each year; however, the actual grazing periods would be coordinated such that the South Seeding Use Area would be grazed in the spring until approximately May 1 and then again in the fall from approximately September 30 to October 15. Use in the late summer/fall would be contingent on the level of use in the spring. The native portion of this pasture would be grazed during the same time frame as the South Seeding Use Area, but utilization monitoring would be used to determine if the use in this Use Area would be deferred until July 1 for two consecutive years out of four. The time of grazing under this system would allow defoliation of the grasses during the early spring growth and the fall regrowth periods, but would allow uninterrupted summer growth. The duration and intensity of grazing would be critical to this system, especially on the native range. Early spring growth would occur before the initial grazing period, allowing the development of leaf area on the grasses. Slight to light grazing during this period is not anticipated to remove the growing points, and the grasses would continue growth when the livestock leave the pasture on or around May 1. Regrowth in the fall would be dependent on the weather in any given year.

Two Use Areas in the North Pequop Mountain Pasture would allow deferment of growing season

use two out of every four years. Livestock would use one Use Area from May 1 to July 31 and the second Use Area from July 1 to September 30 for two years, and then reverse the schedule for the next two years. This system would allow for initial growth in the spring and fall regrowth on one Use Area and spring/summer growth and fall growth on the other Use Area each year. This is anticipated to allow the grass plants to maintain vigor. Utilization of the shrubs during the late summer is anticipated under this system two of every four years. This is anticipated to reduce plant growth and vigor over the short-term if the utilization levels are exceeded, but is not anticipated to have long-term effects if there is compliance with the utilization levels.

The newly created Upper Squaw Creek Riparian Pasture would be rested until proper functioning condition is achieved, and then use would occur for up to three weeks between May 1 and July 31, with specific stubble height and utilization limits on herbaceous and shrub species, respectively. The limited duration and intensity would minimize effects to grasses and shrubs.

The Squaw Creek Ranch Field would be used as necessary as a riparian pasture for up to three weeks between May 1 and July 31 each year in conjunction with other spring/summer use pastures. This field would be used when utilization levels are being reached in other pastures, but limited to up to three weeks, dependent upon monitoring of riparian vegetation in this field. This pasture would also be subject to the herbaceous stubble height and shrub utilizations standards. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

The Lower Squaw Creek Ranch Field would be used as necessary for up to three weeks between August 1 and October 31 each year in conjunction with other summer/fall use pastures. This field would be used when utilization levels are being reached in other pastures, but limited to up to three weeks, dependent upon monitoring of the irrigated meadow vegetation. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

The Windmill Seeding Field could be used from April 1 to October 15, but it generally would be used in conjunction with the Baker Spring Use Area in the North Pequop Mountain Pasture during summer when the livestock are not to be in the Upper East Squaw Creek and East Beacon Spring Use Areas. This use would be primarily to accommodate livestock if the objectives are approached or met in the North Pequop Mountain Pasture. The deferred use of this pasture each year would benefit the herbaceous vegetation by allowing the plants to complete the growth cycle ungrazed in most years.

The Railroad Field Pasture would be under a deferred rotation of summer/fall use for two years followed by spring/summer/fall use the following two years. The use would not occur over the entire use period, but would be determined annually, in conjunction with the Baker Spring Use Area in the North Pequop Mountain Pasture during summer when the livestock are not to be in the Upper East Squaw Creek and East Beacon Spring Use Areas. As with Windmill Seeding Field, the use of this pasture would be to accommodate livestock when short-term objectives are being approached or met in the North Pequop Mountain Pasture. During the summer/fall use, the grass plants would be able to complete their growth cycle, but there would be potential for reduction of the fall carbohydrate production due to the timing of the grazing. Grazing this pasture to the moderate level would not be anticipated to cause any long-term effects to the grasses. Occasional heavy to severe use would result in the inability of the plants to complete root growth and bud development necessary to initiate spring growth and may remove growing points necessary for spring growth. The limitation on the actual period of use (duration) when the pasture is used for the spring/summer/fall would allow either growing season recovery or fall recovery of the plant vigor. Similarly, the intensity (utilization) level would limit impacts to grasses. At slight to light levels of utilization, impacts to vigor of grasses are not anticipated.

The Collar and Elbow Pasture would be used after weaning for late summer/fall/early winter use (August 15 to January 31) each year. The annual use during this period is anticipated to result in herbivory of the shrubs, which would be limited by the utilization standards. Similarly, the use would occur during the fall regrowth period for the cool season grasses and utilization standards would limit the effect.

North of Home Pasture includes the Source Water Area Protection Zone for the spring source portion of the water supply to West Wendover, Nevada. Use in this pasture would be generally limited to trailing between pastures. However, some seasonal use may be made of this pasture to accommodate movement of livestock when utilization levels are reached in other pastures. Under these conditions, utilization standards would limit the amount of herbivory in this pasture to allow for adequate summer and fall regrowth. Effects to grasses and shrubs in this pasture are not anticipated. The construction SOPs in Appendix C would reduce this impact as limits on the extent of vegetation clearing and scheduling of construction activities during dry soil conditions would reduce impacts to vegetation.

Range Improvements

West Big Springs Allotment

The East and West Big Springs Boundary Fence and the West Squaw Creek Fence were identified as the only essential projects for the West Big Springs Allotment under this alternative. The proposed fences would result in some short-term disturbance of the native vegetation during construction. The application of SOPs for fence construction would reduce this impact as minimum vegetation clearing and scheduling of construction outside wet periods would reduce the amount of disturbance. The livestock could develop trails along new fences killing vegetation in a narrow corridor immediately adjacent to the trail, but the fences would also reduce the trampling of riparian areas. Therefore, the overall effect on the existing vegetation would be to control livestock movement and prevent livestock

grazing impacts due to time, duration, or intensity of herbivory on the vegetation.

East Big Springs Allotment

Three fence project and several exclosures and water developments (troughs) have been identified as being essential for the East Big Springs Allotment under this alternative.

The proposed boundary, pasture, and riparian fences would result in some short-term disturbance of the native vegetation during construction. The construction SOPs in Appendix C would reduce this impact as limits on the extent of vegetation clearing and scheduling of construction activities during dry soil conditions would reduce impacts to vegetation. However the overall effect on the existing vegetation would be to control livestock movement and prevent livestock grazing impacts due to time, duration, or intensity of herbivory on the vegetation. Impacts due to trampling in riparian areas would also be reduced.

Non-Native, Invasive Species

West Big Springs Allotment

The interim and final grazing systems proposed under this alternative would reduce the level of impact to vegetation at water sources and in native pastures as compared to the existing system. As indicated above, there would be less use of the riparian areas, and therefore, less compaction of the moist soils. Plant vigor would be increased, which reduce the potential spread of non-native, invasive species and keep them as a minor component of the plant community. Any areas that receive high utilization levels create seedbed conditions that allow non-native, invasive species to readily establish. Once established at these sites, the non-native, invasive species can colonize other sites when conditions are suitable, regardless of the utilization levels. Therefore, the overall affect of the grazing system would be to reduce “entry points” for non-native, invasive species.

The livestock may create trails along the new fence projects, creating sites suitable for non-

native, invasive species into otherwise unaltered landscapes. However, the mechanical action that removes the native perennial vegetation is also likely to keep non-native, invasive species from becoming well established.

The proposed range improvements are essential to achieve the objectives of the grazing system; therefore there is a beneficial aspect to the range improvements. The fences would have the affect of reducing livestock grazing effects on the vegetation, but the surface disturbance associated with the construction of the fences and livestock trails would provide potential sites of establishment for non-native, invasive species.

East Big Springs Allotment

The interim and final grazing systems proposed under this alternative would reduce the level of impact to vegetation at water sources and in native pastures as compared to the existing system. As indicated above, there would be less use of the riparian areas, and therefore, less compaction of the moist soils. Plant vigor would be increased, which reduce the potential spread of non-native, invasive species and keep them as a minor component of the plant community. This would have a beneficial effect with respect to non-native, invasive species.

The fences would have the affect of reducing livestock grazing effects on the vegetation, but the surface disturbance associated with the construction of the fences would provide potential sites of establishment for non-native, invasive species. Livestock trails along and around new fences would increase threat of weed invasion into otherwise unaltered landscapes by direct invasion of plants and transportation of seeds.

The riparian/spring enclosures would allow riparian vegetation to reestablish on the sites currently dominated by non-native, invasive species such as blue mustard and Russian thistle. For some of the other more aggressive non-native, invasive species, the construction of an enclosure to eliminate livestock impacts would not be sufficient to eradicate the invasive species (e.g., hoary cress), thus weed control treatments

may be necessary. The construction SOPs in Appendix C would reduce this impact as limits on the extent of vegetation clearing and scheduling of construction activities during dry soil conditions would reduce impacts to vegetation.

3.3.1.2.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Under this alternative, the permitted livestock use of 13,800 AUMs would be the same as Alternative 2. The grazing system would be modified to provide deferred use or rotation with rest in all pastures with spring/riparian habitats.

Plant Productivity

West Big Springs Allotment

The effects to vegetation within the Independence Valley Pasture would be reduction of fall carbohydrate production and bud development, and reduction of spring growing season carbohydrate production for the cool season grasses. The nine months of use in this pasture would be distributed among several use areas, so there would be some opportunity for recovery from either the fall or spring use.

The effects to vegetation in the Holborn Pasture would be a reduction in photosynthetic activity during a portion of the growing season every other year. The grazing would be initiated late enough in the spring to allow initial growth and growing point elevation. This pasture would also receive late summer use every year during the dormant period. The rest rotation of spring use combined with deferred use each year would allow grasses to maintain their vigor.

Under this alternative, the North Pequop Mountain Pasture would be split, with all of the riparian habitat in the newly created West Squaw Creek Riparian Pasture. This pasture would be rested every other year and receive only growing season use in alternate years. This would allow adequate recovery of root systems and growing point development. Grazing would be deferred until late in the growing season on the remaining

portion of the North Pequop Mountain Pasture. The near complete growing season rest would allow grasses to complete their growth cycle and complete annual root growth and replacement. Annual hot season use of shrubs, such as bitterbrush, has the potential for long-term impacts if utilization levels are exceeded. Livestock may establish trails along the new fence resulting in areas of killed brush.

East Big Springs Allotment

The effects on grasses and shrubs in the Shafter Pasture would be as described above for Alternative 2; the effects of fall/winter and spring defoliation of the grasses and shrubs is anticipated to be offset by the growing season rest. Duration would be controlled by the movement between Use Areas and utilization levels would be used to determine when livestock need to be moved. The use of the third Use Area in wet years would provide some winter relief in the other two Use Areas within this pasture.

The East Pequop Bench Pasture would receive growing season use annually. This pasture has several use areas including the Northern Valley and Pipeline Use Area, the North Bench Seeding Pasture, Hardy Creek, and the South Bench Use Areas. The movement of livestock between these use areas during the grazing period and fall greenup should maintain grass vigor. Utilization of shrubs under this system is anticipated to be slight to light, as grazing would occur when herbaceous forage is green and succulent.

The effects on vegetation in Payne Basin Pasture would be improvement in the vegetation. The alternating rest following growing season use would allow plants to recover from the effects of herbivory. Effects to shrubs and grasses would be minimal under this system due to the opportunity for the grasses to conduct growing season production every other year and fall regrowth every year.

East Squaw Creek, Railroad Field, and Windmill pastures would all receive late growing season to dormant season use annually. This would provide sufficient growing season carbohydrate production to complete root growth and replacement with very little interruption in plant growth.

The portion of the North Pequop Mountain Pasture in the East Big Springs Allotment would be divided into a riparian pasture (East Squaw Creek Riparian Pasture) and the upland portion of North Pequop Mountain Pasture. The riparian pasture would rotate between complete rest and growing season use. The North Pequop Mountain Pasture would be used late in the season, to defer grazing from the growing season. Grass and shrubs are anticipated to improve in plant vigor in both pastures. Livestock may establish a trail along new fences resulting in areas of killed brush. Deferment of use would reduce trampling and soil compaction at riparian areas.

The effects to vegetation in the Squaw Creek Ranch Field would be as described above for Alternative 2. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

The effects to vegetation in the Lower Squaw Creek Ranch Field would be as described above for Alternative 2. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

The effects to vegetation in the Collar and Elbow Pasture would be as described above for Alternative 2. The annual use during this period is anticipated to result in herbivory of the shrubs, which would be limited by the utilization standards. Similarly, the use would occur during the fall regrowth period for the cool season grasses and utilization standards would limit the effect.

The effects to vegetation in the North of Home Pasture would be as described above for Alternative 2. Effects to grasses and shrubs in this pasture are not anticipated.

Range Improvements

West Big Springs Allotment

The proposed boundary and riparian fences would result in some short-term disturbance of the native vegetation during construction. The application of SOPs for fence construction would reduce this impact as minimum vegetation clearing and scheduling of construction outside wet periods would reduce the amount of disturbance. However the overall effect on the existing vegetation would be to control livestock movement and prevent livestock grazing impacts due to time, duration, or intensity of herbivory on the vegetation. Fence construction could result in new trails being developed and isolated loss of vegetation along the narrow corridor.

East Big Springs Allotment

Livestock trailing around the proposed fences may increase the area of disturbance. However, there would be an overall beneficial effect from the control of livestock movements. Fence construction could result in new trails being developed and isolated loss of vegetation along the narrow corridor.

Non-Native, Invasive Species

West Big Springs Allotment

The grazing system proposed under this alternative would reduce the level of impact to vegetation at water sources and in native pastures as compared to the existing system. This would reduce the potential for establishment and spread of non-native, invasive species by reducing the amount of acreage in the heavy and severe utilization categories. Areas that receive these high utilization levels create seedbed conditions that allow non-native, invasive species to readily establish. Once established at these sites, the non-native, invasive species can colonize other sites when conditions are suitable, regardless of the utilization levels. Therefore, the overall affect of the grazing system would be to

reduce “entry points” for non-native, invasive species. Livestock trailing could increase weed introduction into some areas of the allotment as trampled and killed vegetation along trails opens niches up for weed establishment.

The proposed range improvements are essential to achieve the objectives of the grazing system; therefore there is a beneficial aspect to the range improvements. Due to the change in the grazing system under this alternative, the time and duration of grazing should be appropriate to limit the intensity of grazing at existing water sources. The result of the grazing system may be less area in the heavy and severe utilization categories.

Similarly, the fences would have the effect of reducing livestock grazing effects on the vegetation, but the surface disturbance associated with the construction of the fences would provide potential sites of establishment for non-native, invasive species.

East Big Springs Allotment

The effects of the fences in the East Big Springs Allotment would be similar to the effects described above for the West Big Springs Allotment. Livestock trailing could increase weed introduction into some areas of the allotment as trampled and killed vegetation along trails open niches up for weed establishment. The application of SOPs for fence construction would reduce this impact as minimum vegetation clearing and scheduling of construction outside wet periods would reduce the amount of disturbance.

The proposed noxious weed treatments under this alternative would result in a reduction of noxious weed infestations on the allotment, especially if the treated areas are also seeded following successful eradication of the noxious weeds. Reduction of the noxious weed infestations would also reduce the potential seed production, and therefore, reduce the potential for new infestations to establish at new locations.

3.3.1.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, the permitted livestock use of 14,509 AUMs represents a reduction of 7,474 AUMs from Alternative 1. The grazing system under this alternative would eliminate the spring and summer use in the North Pequop Mountain Pasture, with deferred rotation in the East Pequop Bench, and reduce the AUMs available in the Independence Valley pastures. Payne Basin Pasture would receive spring use every other year, and rested in the off years. All other pastures would be in deferred use.

Plant Productivity

West Big Springs Allotment

Grazing in the Independence Valley Pasture would be divided up among the nine Use Areas, defined by water sources (**Table 2-22**), during the late fall to mid-July. The areas would be divided such that deferment of fall/winter use with spring/summer use every other year. The effects on the grass species would be some reduced productivity in the Use Areas receiving spring/summer use, but the plants would receive a period of fall recovery followed by full growing season of deferment before fall/winter use. The Use Areas with fall/winter use in year one would receive a full growing season and fall/winter rest before being used in the spring/summer. Therefore, all grass plants would receive a recovery period to complete their growth cycle, complete root growth and replacement. Shrubs would also receive ample recovery periods between periods of use.

Grazing in the Holborn Pasture would be primarily during the summer (July 15 to September 14) each year with limited additional late fall use (November 1 to November 15) as livestock move through the pasture to return to the Independence Valley Pasture. This system would allow cool season grasses a full season of growth before use, and a portion of the fall regrowth before the late fall use.

The North Pequop Mountain Pasture would receive late summer/fall (September 15 to October 31) use each year. The grasses would receive a full spring/summer growing season of rest each year. Therefore, the grasses should not exhibit any reduced vigor or productivity. Shrub use during this time would be anticipated; however, shrub vigor and form classes should be acceptable when utilization conforms to the utilization objectives.

East Big Springs Allotment

The late fall/winter/spring grazing in the Shafter Pasture would be divided primarily among two Use Areas with different periods of use. Consequently, the one Use Area would receive late fall/winter use and the other Use Areas would receive late winter/spring use. The effects of late fall/winter or late winter/spring defoliation of the grasses and shrubs is anticipated to be offset by the growing season rest. Duration would be controlled by the movement between Use Areas and utilization levels would be used to determine when livestock need to be moved. The use of the third Use Area in wet years would provide some winter relief in the other two Use Areas within this pasture.

A portion of the East Pequop Bench Pasture that was burned in 2000 would be deferred until June 6 each year and used through the summer months every year. The rest of the pasture would be used in early spring in years one and three and late spring through summer in years two and four. The grasses would receive some early spring and growing season rest each year as well as fall regrowth rest. Therefore, effects to grass productivity are not anticipated. Use during the summer dormant period for grasses would result in some shift in grazing to the shrubs. However, movement of the livestock among the four use areas in this pasture would limit any impacts to shrubs.

Grazing in the Payne Basin Pasture would occur in spring/early summer and alternate with complete rest every other year. This would allow for recovery of the effects of herbivory and no impact to grasses is anticipated. The cessation of

grazing before the hot season and the complete rest every other year would limit use on shrubs to the slight or light level.

The East Squaw Creek Pasture and Windmill Seeding Pasture would be grazed every year during the hot season (August 15 to September 15). The seedings in both pastures, and the native portion of East Squaw Creek Pasture would receive complete growing season rest and rest during the fall regrowth period. The grasses would have an opportunity to complete root growth and replacement and complete their growth cycles each year.

The North Pequop Mountain Pasture would not be grazed until early fall (September 15 to October 31) each year. This would avoid growing season use of the grasses, but would have potential to reduce fall regrowth, depending on the utilization levels. Shrubs would receive some use during this period, but the duration is relatively short. Impacts to the grasses and shrubs are not anticipated if the utilization levels are followed.

Railroad Field is a large sagebrush-bunchgrass pasture that would receive use every year between July 1 and September 30. Impacts to grasses would be limited due to the dormant season use and rest during the fall regrowth period.

Collar and Elbow Pasture would be grazed in fall/winter (September 1 to January 31). Potential exists for use during the fall regrowth period, which could reduce the number of new buds for spring growth. The grasses would have the entire growing season to complete their growth cycle. Some use of the shrubs is anticipated during this time period, especially winterfat. The utilization level limits for winterfat, combined with the growth habitat of this species, should limit impacts to winterfat and other shrubs.

The Lower Squaw Creek Ranch Field would be used as necessary for up to three weeks between August 1 and October 31 each year in

conjunction with other summer/fall use pastures. This field would be used when utilization levels are being reached in other pastures, but limited to up to three weeks, dependent upon monitoring of the irrigated meadow vegetation. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

North of Home Pasture includes the Source Water Area Protection Zone for the spring source portion of the water supply to West Wendover, Nevada. Use in this pasture would be generally limited to trailing between pastures. However, some seasonal use may be made of this pasture to accommodate movement of livestock when utilization levels are reached in other pastures. Under these conditions, utilization standards would limit the amount of herbivory in this pasture to allow for adequate summer and fall regrowth. Effects to grasses and shrubs in this pasture are not anticipated.

The proposed grazing system for the East Big Springs Allotment under this alternative repeats the time and duration of use in most of the pastures each year. As discussed above under the West Big Springs Allotment, there is potential for this system to cause long-term species composition changes in the pastures. The less palatable species are likely to increase and the more palatable species are likely to decrease in abundance. Variation in the annual timing and amount of precipitation and plant phenology may be sufficient to offset this “selective pressure.” In addition, movement among use areas may also reduce this pressure.

Range Improvements

West Big Springs Allotment

No projects were identified as essential to this alternative in this allotment. Therefore, no impacts from range improvements are anticipated.

East Big Springs Allotment

No projects were identified as essential to this alternative in this allotment. Therefore, no impacts from range improvements are anticipated.

Non-Native, Invasive Species

West Big Springs Allotment

The proposed grazing system under this alternative is anticipated to result in short-term improvements in the vegetation by reducing grazing time, duration, and intensity on the desirable plant species. Maintenance of plant vigor and plant stocking in native plant communities is one means of reducing potential for non-native, invasive species invasion. Therefore, the grazing system should result in less susceptibility of the native vegetation to establishment of non-native, invasive species. Species such as halogeton, Russian thistle, and tumble mustard, which can be out-competed by existing native vegetation would likely decline in abundance and distribution. Other, more aggressive species, such as cheatgrass, Canada thistle, and bull thistle, would require additional measures to eradicate existing infestations.

East Big Springs Allotment

As discussed above for the West Big Springs Allotment, the proposed grazing system would improve plant vigor and plant stocking in the native plant communities. This would reduce the potential for non-native, invasive plant establishment within the allotment.

The elimination under this alternative of the nine spring exclosures is likely to allow for additional non-native, invasive species establishment. Concentrated livestock use at the spring sites creates conditions suitable for blue mustard, cheatgrass, hoary cress, perennial pepperweed, and other non-native, invasive species. These sites then become sources for seed dissemination throughout other portions of the allotment. Therefore, even with the proposed noxious weed treatments, non-native, invasive species are anticipated to increase on the allotment under this alternative.

3.3.2 Wetlands/Riparian Zones

3.3.2.1 Affected Environment

The management framework with respect to wetland/riparian zones is provided in **Appendix B**.

Riparian habitat on public lands is limited in the Big Springs Allotment. Most of the riparian habitat on public lands is located within the Pequop Mountains, north of Interstate 80. The largest riparian system is the East Squaw Creek drainage. Additional springs are located in the West Squaw Creek drainage, and scattered within the North Pequop Mountain area. Most of the water sources on public lands within the remainder of the allotment are seeps.

The riparian zones on public lands primarily consist of meadow grasses, sedges, and rushes. However, many of the water sources have been developed with all of the water piped to troughs. Consequently, the riparian vegetation at the source areas is minimal to non-existent. There are also some riparian areas within the allotment that support trees, such as aspen and willows.

Several large springs occur within the allotment on private lands. There are five wells on public lands and springs on private lands that are municipal water sources for the city of West Wendover, Nevada. The spring sources are located near the Big Springs Ranch and the wells are located south of the Shafter interchange off Interstate 80. All of these municipal water sources have a delineated water quality protection zone on public lands (Aqua Engineering 2000). The Source Water Protection Zones on public lands have no stockwater or livestock concentration areas.

3.3.2.2 Environmental Consequences

The Big Springs Allotment is used by cow/calf pairs, dry cows, and yearlings, wild horses, and

wildlife. The livestock, wild horses, and wildlife are present throughout the entire year. The water sources are used by all of the animals during some part of the year, depending on the grazing system (livestock) and seasonal habitat use (wild horses and wildlife), and depending on the availability of the water.

With respect to riparian vegetation, cows are primarily grazers, using shrubs during the hot season, or during the fall and winter to finish the diet of dried grasses or hay. The use of riparian vegetation by livestock can occur in any season, but tends to receive concentrated use during the hot season (dormant season for upland, cool season grasses).

3.3.2.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Livestock grazing was one of the causal factors in not meeting some riparian allotment objectives and rangeland health standards. Continued use of the spring and seep areas under this alternative would impact vegetation due to the time, duration, and intensity of the grazing at these locations. Trampling of riparian areas has resulted in a reduction in plant vigor due to soil compaction and mechanical damage to the plants. Improvement of the riparian vegetation is not anticipated under this alternative. Potential for non-native, invasive species to establish at riparian areas would be high under this alternative.

The amount of water removed from spring sources also creates a long-term impact to the riparian vegetation. Without a spring development to remove the water, the spring creek flows from the spring and saturates the adjacent ground. The extent of this saturation zone depends on the amount of water exiting the spring and the gradient below the spring. The riparian meadow and/or shrub vegetation that develops is dependent on this annual wetting cycle and extended growing season moisture. When the spring is developed, the area of meadow or shrub vegetation is reduced as the area of saturation is

reduced. When all of the water is collected and removed, or stored in reservoirs, the riparian value of the spring is virtually eliminated. This occurs at the Moor Summit Spring/Seep, Beacon Springs/Reservoirs, Rocky Point Spring, Pequop Spring, Baker Spring/Pipeline, and Pencil Lead Spring.

3.3.2.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Under this Alternative, several spring/riparian areas in the West Big Springs Allotment and an undetermined number of springs in the East Big Springs Allotment would be protected by construction of exclosures and development of water troughs outside the exclosures. Livestock use of the riparian vegetation associated with these springs would be eliminated. The spring and riparian vegetation would return to functioning condition.

The grazing system under this alternative provides hot season rest, growing season rest, or fall season rest through rotation or deferment of the North Pequop Mountain and Payne Basin, and pastures. These pastures contain the majority of the riparian zones. Duration and intensity would be limited within the pastures. In addition, the largest riparian system which is within the East Squaw Creek drainage has specific stubble height and utilization objectives for riparian herbaceous and woody species (**Table 2- 25**). Consequently, improvement in the unfenced riparian areas is anticipated under this alternative. The livestock could develop trails along new fences killing vegetation in a narrow corridor immediately adjacent to the trail, but the fences would also reduce the trampling of riparian areas. Therefore, the overall effect on the existing vegetation would be to control livestock movement and prevent livestock grazing impacts due to time, duration, or intensity of herbivory on the vegetation.

These improvements in riparian area vegetation would reduce the potential for non-native,

invasive species establishment and expansion within the allotments.

3.3.2.2.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Under this alternative, the nine spring/riparian areas in the East Big Springs Allotment would not be protected by construction of enclosures. Livestock use of the riparian areas would continue. However, due to the implementation of the grazing system, two riparian pastures would be created. The pastures with the springs would be grazed early every other year and rested during alternate years, which should result in improvement of the riparian areas. The livestock could develop trails along new fences killing vegetation in a narrow corridor immediately adjacent to the trail, but the fences would also reduce the trampling of riparian areas. Therefore, the overall effect on the existing vegetation would be to control livestock movement and prevent livestock grazing impacts due to time, duration, or intensity of herbivory on the vegetation, but the impact would be greater than Alternative 2, due to the lack of riparian enclosures.

Under this alternative, the riparian areas would continue to be a potential site for non-native invasive species establishment until improved conditions are achieved.

3.3.2.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, no spring enclosures would be constructed in the East Big Springs Allotment or the West Big Springs Allotment. The proposed grazing system would provide growing season rest in Payne Basin, East Squaw Creek, and North Pequop Mountain pastures. The lack of hot season use in the North Pequop Mountain Pasture, where most of the riparian areas are located, would allow improvement of the riparian vegetation. Under this alternative, the riparian areas would continue over the short-term to be a potential site for non-native, invasive species

establishment. Improvement over the long-term should decrease the potential for non-native, invasive species to establish.

3.3.3 Avian Sensitive Species

3.3.3.1 Affected Environment

The management framework with respect to avian sensitive species is provided in **Appendix B**.

Based on the Minute Order issued by Judge McKibben, sage grouse was the only species for which analysis was required. Sage grouse occur within the northern and central portions of the allotment (**Map 3-7, Appendix A**). A description of the habitat requirements and food habits of sage grouse is provided below.

Sage Grouse

Habitat descriptions for sage grouse are included in Section 3.2.3.1.

Nine leks or lek complexes have been documented in the allotment, along with nesting, brood, summer, and winter habitat. Sage grouse have not been documented in the Independence Valley, south of Interstate 80 or in Goshute Valley south and east of the railroad track. NDOW collected lek data for seven of the nine leks (complexes) within the Big Springs Allotment in 2006. All of the leks surveyed were either stable or had increases in attendance except one. Three of the leks which had no birds in attendance in 2001 were active in 2005. An additional possible lek with 12 birds in attendance was discovered during 2006 lek surveys south of Interstate 80.

The sagebrush plant community located on the benches east of the Pequop Mountains, between the salt desert shrub in the valleys and pinyon-juniper on the mountain slopes is the primary breeding, nesting, and wintering area south of Interstate 80. Potential summer range occurs at the high elevation mountain tops, where low sagebrush and black sagebrush cover the ridges and mountain big sagebrush occurs in the basins and draws. North of Interstate 80, winter, breeding, and nesting habitat occurs on benches and foothills at the west, north, and east portions

of the Pequop Mountains. The upper elevations of this portion of the mountain range have more intact sagebrush available for brood habitat and summer range. The springs, seeps, and drainages also provide important brood habitat in this area.

3.3.3.2 Environmental Consequences

3.3.3.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Direct impacts to sage grouse under this alternative, such as nest destruction, would be incidental. Indirect effects have potential to occur at nesting habitat and summer brood habitat. Direct disturbance at leks may also occur, but would also be incidental.

Under this alternative, the East Pequop Bench Pasture would continue to receive fall/winter/spring use by livestock. Three sage grouse leks and suitable winter habitat occur in this pasture. Nesting habitat is often associated with the leks. Potential nesting habitat within the vicinity of these sage leks would consist of the Wyoming big sagebrush habitat located on the benches between the pinyon-juniper and salt desert shrub communities. Therefore, it is likely that sage grouse spend most of the fall through spring period in this pasture, which overlaps with the livestock period of use. The fall and winter use by livestock would reduce residual cover in the nesting areas. Residual cover has been found to be related to nest site selection and nest success. Therefore, there is potential for impacts to sage grouse nesting under this alternative.

The presence of livestock during the breeding season may also contribute to disturbance of the birds on the lek. While an individual cow or two grazing in the area can be ignored, several cows moving through the lek will cause some birds to leave for the day and others to move to other portions of the lek (Back, personal observations). If the lek is located between water and forage, the disturbance may occur repeatedly during the breeding season and interrupt breeding activities.

The Holborn, Payne Basin, East Squaw Creek, and Railroad Field pastures all receive spring/summer livestock use under this alternative. Holborn, East Squaw Creek, and Railroad pastures all have active leks located in the pastures. The spring use would have the potential to impact nesting and breeding, as described above.

North Pequop Mountain, Payne Basin, and Six Mile Canyon pastures include the brood and summer habitat within the allotment. Six Mile Canyon brood and summer habitats may be limited in extent and quality due to the amount of woodland present. The pinyon-juniper and upper elevation conifer woodlands separate the lower elevation breeding/nesting habitat from the upper elevation sagebrush habitats, and the woodlands have encroached into the sagebrush habitats over time. Summer livestock use in these three pastures, especially use in the riparian areas, would continue to impact sage grouse brood and summer habitat through the impacts to riparian areas and springs. Conversion of the riparian vegetation to blue mustard and hoary cress eliminates the native forbs used by sage grouse during this period.

Under this alternative, the water developments at the springs would continue to direct all of the spring flow away from the spring riparian area to troughs. This reduces the area of riparian habitat associated with the spring, effectively reducing the quantity of sage grouse summer brood habitat.

3.3.3.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

West Big Springs Allotment

Under this alternative, North Pequop and Holborn pastures would receive livestock use during mid-May to August, or through September, respectively with deferment until August or July in alternating years (**Table 2-22**). Direct impacts to sage grouse under this alternative, such as nest destruction, disturbance at leks, or fence mortalities, would be incidental. Indirect effects

have potential to occur at summer brood habitat, winter habitat, nesting habitat. However, the overall effect of the alternative would be improvement of habitat quality.

The spring use is not anticipated to remove sufficient vegetative cover to substantially impact nest success. Utilization patterns under the existing grazing system indicate large acreages in each pasture receive slight to light utilization from livestock. These levels of utilization would be expected to occur under this alternative as well. Therefore, opportunity exists for sage grouse to select nest sites with residual cover.

The deferred use and enclosure construction would increase cover in the meadows, with potential for increased sage grouse use. The SOP that sets fences back from the edge of meadows would reduce the potential for sage grouse collisions with the fence. The development of woody species in the riparian areas would need to be monitored to ensure that the meadows are not completely taken over by woody species, which would make them less suitable to sage grouse.

The annual use of these pastures, or portions thereof, during the summer months has potential to impact summer brood habitat. Spring enclosures may be proposed at a future date, pending monitoring of riparian areas.

The proposed fence has potential to cause sage grouse mortalities resulting from collisions with the newly constructed fences. The East and West Big Springs Boundary Fence in the North Pequop Pasture would occur in sage grouse summer habitat; therefore potential exists for collisions. The SOPs for fence construction in sage grouse habitat would make the fences more visible and reduce the potential for these types of mortalities.

The predicted improvement in the range condition and riparian improvement as a result of implementation of this alternative is anticipated to improve the overall quality of sage grouse nesting and summer habitat in this allotment.

East Big Springs Allotment

Under this alternative, East Pequop Bench, Payne Basin, Six Mile Canyon, East Squaw Creek, and North Pequop Mountain pastures would all be on a deferred rotation between spring and summer/fall use or spring and fall/winter use. Direct impacts to sage grouse under this alternative, such as nest destruction, disturbance at leks, or fence mortalities, would be incidental. Indirect effects have potential to occur at summer brood habitat. However, the overall effect of the alternative would be improvement in habitat quality.

All of these pastures include potential nesting habitat; therefore, grazing would occur during the spring (early or late, depending on the pasture and year) nesting period. Utilization patterns under the existing grazing system indicate large acreages in each pasture receive slight to light utilization from livestock. These levels of utilization would be expected to occur under this alternative as well. Therefore, opportunity exists for sage grouse to select nest sites with residual cover, and the spring grazing is not likely to impact nesting success.

The annual use of these pastures, or portions thereof, during the summer months has potential to impact summer brood habitat. The spring enclosures proposed for these pastures would improve the riparian habitat conditions, which would benefit sage grouse. The fences associated with the spring enclosures may have an impact due to collisions, but sage grouse generally approach spring areas on the ground using the sagebrush cover to conceal their approach. Therefore, the fences are not anticipated to be a major mortality factor.

The fences proposed for East Squaw Creek Pasture and Upper East Squaw Creek Riparian Pasture have potential to cause sage grouse mortality through collisions with the new fences. Although the SOP that sets riparian fences back from the edge of the meadow would reduce the potential for sage grouse collisions with the riparian fence.

The spring enclosures included in this alternative have potential to improve the riparian habitats, which would improve the quality of sage grouse summer brood habitat.

3.3.3.2.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

West Big Springs Allotment

Direct impacts to sage grouse under this alternative, such as nest destruction or fence collisions, would be incidental. Indirect effects have potential to occur at summer brood habitat.

Under this alternative, the West Squaw Creek Pasture would receive spring/summer use every other year complete rest in alternate years, and the Holborn Pasture would receive spring/summer use every other year and late use for fifteen days every year. These two pastures have potential nesting habitat; however, residual growth and new growth is expected to be adequate for nesting cover.

The riparian pasture, West Squaw Creek Riparian Pasture, would be grazed in a manner to improve riparian vegetation. This would improve sage grouse summer brood habitat.

The potential for sage grouse mortality related to fence construction would be similar to Alternative 2.

East Big Springs Allotment

Direct impacts to sage grouse under this alternative, such as nest destruction or fence mortalities, would be incidental. Indirect effects have potential to occur at summer brood habitat, nesting habitat, and winter habitat.

Under this alternative, livestock use in the East Pequop Bench Pasture would occur during the nesting season and potential exists for reduction of nesting cover. The late spring use, followed by a year of complete rest, in the Payne Basin and East Squaw Creek Riparian pastures would have

negligible impact on nesting cover in the year of use and allow both residual cover and new growth at nesting sites in the year of rest.

The North Pequop Mountain Pasture would receive late summer use annually, which would reduce residual cover for nesting habitat the following spring. Conformance with the utilization objectives would provide adequate residual cover along with new growth the following spring. The creation of the East Squaw Creek Riparian Pasture would improve sage grouse brood habitat quality.

The impacts from the other range improvements would be as discussed under Alternative 2.

3.3.3.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

West Big Springs Allotment

Direct impacts to sage grouse under this alternative, such as nest destruction, would be incidental. Indirect effects have potential to occur at nesting habitat, summer habitat, and winter habitat.

Under this alternative, spring livestock use of the Holborn and North Pequop Mountain pastures would be eliminated, which would provide for sage grouse breeding and nesting in the absence of livestock and result in the availability of all the current year's herbaceous growth to provide nesting and brood rearing cover. The summer and late fall use in the Holborn Pasture and late summer/early fall use in the North Pequop Pasture would reduce the residual cover in these nesting habitats. However, conformance with the utilization objectives would provide adequate residual cover along with new growth the following spring.

The improvement in riparian condition under this alternative could lead to woody dominated vegetation, reducing the quality of the riparian habitat for sage grouse.

East Big Springs Allotment

Direct impacts to sage grouse under this alternative, such as nest destruction, would be incidental. Indirect effects have potential to occur at summer habitat, winter habitat, and nesting habitat.

Under this alternative, grazing in two pastures with nesting habitat would be deferred until summer (North Pequop Mountain and East Squaw Creek pastures) and use in two other pastures with nesting habitat (East Pequop Bench and Payne Basin pastures) would be either of short duration or late spring use rotated with complete rest. No direct impact from cattle during strutting would occur under this alternative. No livestock use would occur during the nesting season for the majority of the habitat identified as suitable for nesting. This would result in the availability of all the current year's herbaceous growth to provide nesting and brood rearing cover. As discussed above for the West Big Springs Allotment, there is some potential for the summer use in these pastures to remove residual cover for the following nesting season; however conformance with the utilization objectives would provide adequate residual cover along with new growth the following spring.

3.3.4 Conservation/Mitigation Recommendations and Residual Impacts

3.3.4.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

No conservation or mitigation recommendations for vegetation have been made for Alternative 1. This alternative represents the system which was evaluated in the allotment evaluation process and Alternative 2 was developed to make the necessary changes required to meet rangeland health standards and allotment objectives.

Mitigation would include annual inspection of the spring areas and treatment, as necessary, of non-native, invasive species.

Residual impacts under this alternative include non-achievement of rangeland health standards for riparian sites. Shrubs and grasses would continue to suffer the effects of early spring defoliation, heavy utilization near water sources, and repeated hot season use. Non-native, invasive species would continue to spread throughout the allotments where livestock concentrate and where wild horse impacts occur.

Residual impacts would include heavy to severe use of the spring areas and potential for non-native, invasive species to establish at the spring sites and displace the riparian vegetation.

Under this alternative, impacts to the riparian areas at springs would continue as an ongoing and residual impact to sage grouse.

3.3.4.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Without fences, there is potential for livestock to drift among use areas. Mitigation may include evaluation of the amount of drift and the impact on meeting short-term objectives with subsequent need to adjust livestock use or construct additional fencing.

The additional water sources proposed under this alternative have potential to create additional heavy to severe use areas in the vicinity of these new water sources. Mitigation would include monitoring for non-native, invasive species at these sites and either treatment of infestations or seeding species suitable to the site and use levels. The other range improvements proposed also have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Under this alternative non-native, invasive species would continue to establish within the allotments, albeit at reduced rates than under the current management system. Mitigation for the impacts of the range improvements would include annual spring inspection of the trough areas and the perimeter of the enclosures to detect and

subsequently treat noxious weeds and other non-native, invasive species. Early detection and treatment each year would prevent the undesirable species from completing their growth cycle, thus reducing the production of seeds that could be transported to other sites within or beyond the allotments.

A second mitigation measure would include seeding those areas receiving heavy use each year, as necessary, with desired perennial grass species such as Great Basin wildrye, crested wheatgrass, or other perennial grass that can better withstand the effects of concentrated livestock use at the water troughs. This would reduce the potential for non-native, invasive species to dominate the site, especially if annual treatment of noxious weeds is conducted.

Mitigation under this alternative would include annual evaluation of the non-enclosed springs to determine if rangeland health standards for riparian areas are being met and treatment, as necessary, of non-native, invasive species. Inspection of the areas near the troughs would also be necessary to ensure non-native, invasive species do not establish at these sites and then spread to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Residual impacts under this alternative would include potential for non-native, invasive species to establish and spread within the allotments.

Livestock trailing along new fences and creating potential establishment sites for non-native, invasive species would be a residual impact.

Residual impacts to riparian vegetation under this alternative would be to the non-enclosed spring areas. Potential for non-native, invasive species to establish on these areas would continue.

Residual impacts would occur at the spring enclosure for sage grouse if the enclosure vegetation becomes shrub or tree dominated. The value of this area would decline for sage

grouse. Mitigation would include occasional, short-term grazing or other shrub treatment to keep the riparian area at least partially as a meadow complex for sage grouse broods.

3.3.4.3 Alternative 3 – Permit Grazing Without Riparian Exlosures and Vegetation Treatments

The proposed fence projects have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Treatment for non-native, invasive species would be mitigation for the impacts to riparian vegetation. The continued use of these areas would exacerbate the already existing infestations of non-native, invasive species. Treatment, followed by seeding with species suited to the site would reduce the impact to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

A residual impact under this alternative would include extensive non-native, invasive species expansion within upland areas.

3.3.4.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Treatment for non-native, invasive species would be mitigation for the impacts to riparian vegetation. The continued use of these areas would exacerbate the already existing infestations of non-native, invasive species. Treatment, followed by seeding with species suited to the site would reduce the impact to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Residual impacts under this alternative would include potential for non-native, invasive species to establish and spread within the allotments.

3.3.5 Cumulative Effects

3.3.5.1 Past Actions

Historic grazing in northern Nevada is described in Section 3.2.5.1.

As indicated in the Allotment Evaluation (BLM 2000b) there have been at least 113 wildland fires documented on the Big Springs Allotment. Most of these fires occurred in the pinyon-juniper and mixed conifer vegetation on the Pequop Mountains, Toano Range, and Wood Hills. Most of the fires were small lightning strikes associated with precipitation and burned less than one-half acre. However, several fires in the 100- to 300-acre size and from 1,000- to 3,500-acre size have occurred. There were four large fires since 1991 (**Map 3-6**). Fire rehabilitation projects included seeding a small portion of the area burned on the East Pequop Bench in 1991. Most of the burned area was on private land at that time, prior to the BLM acquiring that burned area in the BSR Land Exchange. Most of the area burned in 1991 is now dominated by big sagebrush and rabbitbrush with an understory composed primarily of cheatgrass and mustard weeds along with a few Indian ricegrass plants. Fire rehabilitation projects following the Wood Hills Fire of 1993 located on the west side of the Independence Valley Pasture included seeding most of the burn area. The third large fire occurred in the northwestern portion of the North Pequop Mountain Pasture in 2001. Rehabilitation measures applied following this fire did not include seeding because the surviving native grasses were considered adequate for stabilization. The fourth large fire was the Big Springs Fire of 2000, which was also seeded. Fire rehabilitation projects included seeding with a variety of seed mixes. Cheatgrass is common within these burned areas and the potential for more frequent ignitions in these same areas now exists.

The lack of fire during the mid-1900s up until the more recent increase in fires, allowed pinyon-juniper woodlands to expand into the sagebrush

communities, especially the black sagebrush community. This expansion reduced the amount of sage grouse habitat, primarily along the foothills and benches. The expansion of the woodland community in canyons and along drainages also created unsuitable conditions for sage grouse to use these areas as summer brood habitat. The woodland is raptor habitat and sage grouse generally avoid wooded areas. The loss of sagebrush-bunchgrass communities also had potential to reduce cottontail and jackrabbit populations, two primary prey species for the larger raptors. Consequently, there was an increase in nesting habitat for some species of raptors, but a decline in foraging habitat for other raptor species.

Where sagebrush was not being replaced by pinyon-juniper, the competition between shrubs and grasses, as the shrubs increased in density and stature, has created additional stress on the grasses. The ability of shrubs to acquire soil moisture and nutrients is greater than the ability of grasses. Where grazing adds to the stress on grasses by depleting root reserves, the decline in grass abundance is accelerated. Periodic treatment of the vegetation, combined with seeding native grasses when necessary, would offset the change in fire ecology that has eliminated the low to moderate intensity fires that kept the sagebrush community productive. This has had an overall impact on the productivity of many range sites, which has likely resulted in less prey species through loss of herbaceous forage and seed abundance. Similarly, this loss of various age classes and structure of the sagebrush community has resulted in less pre-laying, nesting, and early brood habitat for sage grouse.

Although the construction of the railroad occurred before many of the non-native, invasive species were introduced to the Great Basin, the construction did create disturbance that allowed native weedy species to establish and dominate the railroad right-of-way, borrow pits, gravel pits, and the railroad stations, like Shafter (water supply stops for the old steam engines). The trains, especially the old steam engines, but even

the modern day trains, cause wildland fire ignitions. These fires facilitate the establishment of cheatgrass in the salt desert shrub and sagebrush communities. The railway has also been a travel way for non-native, invasive species to move across the landscape.

Similarly, Interstate 80 is a travel way for non-native, invasive species and increases the potential for man-caused fire ignitions. Interstate 80 extends through the allotment from the east side to the northwest side.

Within the last decade, mineral exploration has occurred within the Pequop Range which resulted in exploration road and drill pad disturbance. Reclamation was completed on this disturbance, and some of the previous land use values have been restored; however, cheatgrass invaded along the roads prior to rehabilitation and continues to persist along these roads.

The build-up of wild horse population within the HMA has also contributed to the current condition of the springs and upland vegetation.

3.3.5.2 Present Actions

Impacts of the pre-MUD grazing were detailed in the Big Springs Allotment Evaluation (BLM 2000b) and summarized in the analysis for Alternative 1 in above. Dispersed recreation, including hunting, OHV (Off Highway Vehicle) use, and BLM-authorized OHV organized events are responsible for the creation of new trails, which become pathways for non-native, invasive species. Creation of the trails impacts the established flora by physically damaging the plants, creating soil erosion, and creating competition between the native plants and the non-native, invasive species.

Recent drought has also affected the productivity of the plants. Minimal leader growth on the shrubs was observed in recent years, resulting in voluntary non-use of the allotments.

Wildlife habitat and the use of the habitat by wildlife were not identified in the allotment evaluation as contributing to the non-achievement of allotment objectives or rangeland health

standards. In contrast, the use of certain habitats by wild horses did contribute to the non-achievement of objectives and standards.

The use of the Goshute Mountain monitoring site by Hawkwatch International has been subject to the conditions required for WSAs and has had minimal impact on the vegetation.

3.3.5.3 Reasonably Foreseeable Future Actions

As discussed in Section 2.7.2.2, the reasonably foreseeable future actions include continued livestock grazing, additional range improvements as necessary, fire suppression and rehabilitation efforts, and change in land status and use for recreation.

The continuation of grazing under Alternatives 2, 3, or 4 would be anticipated to improve the general condition of the range. Alternative 3 would provide for improvement of the springs and riparian areas, but the improvement would be less than Alternative 2 and Alternative 4. Non-native, invasive species would be anticipated to continue to be present in the allotments, but the rate of increase is likely to be less under Alternatives 2 and 4.

Overall improvement of the habitat for sage grouse and raptor prey species is anticipated under Alternatives 2, 3, and 4, but sage grouse summer brood habitat and short-eared owl habitat would not improve as quickly under Alternative 3.

The other range improvements that have been identified as facilitating the grazing system would be added on a case-by-case basis. The fences would have similar impacts as have been identified previously; potential for raptor and sage grouse collisions and establishment sites for non-native, invasive species. The water developments and riparian enclosures would result in improved riparian condition. The seedings would have some temporary impacts to sage grouse, but over the long-term, would provide new habitat for sage grouse and many prey species.

Fire suppression and burned area emergency rehabilitation are likely to continue. This is likely to reduce the changes in the plant community due to large fires (i.e., fire suppression should limit the size of the fires), but also result in somewhat less diverse communities in the short-term (i.e., the fire rehabilitation seed mixes generally only include a few species).

The acreage of habitat for prey species and raptor foraging is likely to be reduced by expansion of human occupation of private lands within the allotments near Wells, Nevada. These allotments are likely to receive increased recreational use, which has potential to increase the abundance of non-native, invasive species.

The incremental impact of the proposed changes in grazing use and construction of range improvements would not result in significant cumulative adverse effects. Under all alternatives, environmental conditions would largely improve and the potential losses of habitat resulting from land use changes around Wells would be offset. The conversion of habitat and redistribution of habitat components resulting from fire suppression and fire rehabilitation activities would complement the improvements anticipated from implementing the proposed action or alternatives as the negative effects of wildfire are mitigated. The cumulative impact of constructing the proposed essential range improvements would be positive as implementation of SOPs contained in Appendix C would reduce or eliminate several potential impacts.

On balance, the cumulative effects of the proposed action and the past present and reasonably foreseeable future actions do not result in significant impacts to the human environment.

3.4 Owyhee Allotment

3.4.1 Vegetation Resources (Including Non-native, Invasive Species)

3.4.1.1 Affected Environment

The management framework with respect to vegetation and non-native, invasive species is provided in **Appendix B**.

The distribution of vegetation types in the Owyhee Allotment is shown on **Map 3-8, Appendix A**. The allotment is characterized by a high rolling plateau underlain by basalt flows which are occasionally cut by deep, vertically walled canyons. Elevations range from approximately 5,100 feet to 5,600 feet. In general, the vegetation consists of basin big sagebrush, Wyoming big sagebrush, Sandberg bluegrass, bottlebrush squirreltail, and lesser amounts of bluebunch wheatgrass, Indian ricegrass, and needlegrass. Mat muhly is a grass species associated with the Wet Clay Basin Ecological Site on vegetated playas.

Three noxious weeds have been identified at 59 sites within the Owyhee Allotment. The majority of these infestations have been found along roadsides and a few were found along stream channels. Hoary cress was found at 28 different sites and covered approximately 850 acres. Canada thistle was identified at nine sites with a total distribution of 220 acres. Six sites totaling approximately 175 acres were infested by Scotch thistle. Several infestations overlapped, with one or more species occurring on the same site. Therefore the total acreage of noxious weed infestation is less than the total of the individual species' infestations.

Other non-native, invasive species found within the allotment include halogeton, cheatgrass, and tumble mustard. Most occur in disturbed sites, roadsides, and burned areas. Cheatgrass is common in the understory of some native ranges.

3.4.1.2 Environmental Consequences

The Owyhee Allotment is used by cow/calf pairs, domestic horses, wild horses, and wildlife. Grazing by domestic livestock has been from February 15 to December 15. The wild horses and wildlife are present throughout the entire year. Cows are primarily grazers, feeding on the herbaceous forage during the growing season and dry grasses in the fall/winter. However, cows use browse (woody vegetation) during the summer, fall, and winter, transitioning to a mostly herbaceous diet in spring and early summer. Sagebrush is the major shrub species in the allotment and cows do not generally use much sagebrush. Willows and other riparian shrubs do receive use by cows during the hot season.

Although the term “range improvements” encompasses many types of actions, the range improvements proposed for the Owyhee Allotment include: wells, pipelines, and riparian pasture fences.

3.4.1.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

The previous grazing permits for the Owyhee Allotment provided for a total of 30,155 AUMs. The 1987 AMP implemented a combination of rest-rotation and deferred-rotation systems to provide growing season rest in each of the native pastures one year out of two.

Actual use during the period 1981 to 1999 for Owyhee Allotment averaged 18,862 AUMs, with a low of 10,247 AUMs and a high of 29,379 AUMs.

Under this alternative, the grazing use would continue to follow the 1987 AMP. This grazing system was fully implemented in 1990 following the completion of pasture fences and seeding.

The evaluation of this system (BLM 2000c, Owyhee Allotment Evaluation) concluded that while some of the rangeland health standards, allotment objectives, and key area objectives were met, others were not being met or only partially met.

Plant Productivity

The rest-rotation and deferment implemented under this system has resulted in improvement of the uplands, but riparian issues still remain. The hot season use in the Star Ridge Pasture has been voluntarily removed by the permittee since 1995. The rest given to Star Ridge and Dry Creek pastures provided grasses and shrubs the ability to grow in the absence of livestock grazing every other year. However, the use on the riparian areas resulted in utilization levels that did not allow the grasses and shrubs to adequately recover (a situation exacerbated by livestock from the adjacent allotment using the riparian areas).

The deferred use in the Lower and Upper Fourmile and Chimney Creek pastures provided growing season rest every other year and late spring rest each year. This amount of growing season rest/deferment would allow the grasses to maintain vigor.

Non-Native, Invasive Species

The grazing system under this alternative would reduce the spread of non-native, invasive species as a result of the increased vigor of the native grasses. Occupation of the riparian areas by non-native, invasive species would continue under this system, as the native riparian vegetation has not recovered sufficiently to reduce the opportunity for non-native, invasive species to establish.

3.4.1.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

The grazing system proposed in the MUD is described in Section 2.5.2. The permitted livestock use of 23,247 AUMs under the interim grazing plan of this alternative represents a

reduction of 6,908 AUMs from Alternative 1. There are 29,903 AUMs potentially available for the final grazing system, provided monitoring indicates the short-term objectives can be met at this level of use. Period of use for the allotment would be mid-February to mid-December with use spread out by pastures and seasons over the year (Table 2-34 and Table 2-36). Wild horse AUMs would be 2,369 AUMs or an increase of 425 AUMs over the actual use during the period 1982 to 1999.

The average actual use has resulted in less use than provided for in the short-term objectives. The long-term objectives are being met in most areas with the exception of some wildlife objectives. The causal factor for not meeting the wildlife objectives is not livestock, but rather plant community dynamics. The carrying capacity calculations indicate that increases in use over the average actual use are warranted in all pastures except the Lower Fourmile Pasture. However, the reason for not stocking above the average actual use is to normalize the herd to the limiting pasture (i.e., Lower Fourmile Pasture).

Plant Productivity

The Star Ridge Pasture would receive late winter use and early spring/summer use every other year and complete rest in the alternate years under this alternative. The early spring/summer use each year has the potential to remove early growing points as the grasses grow. This is anticipated to impact grass vigor and productivity near water sources or other areas of heavy use. Impacts to grasses are not anticipated for areas of slight or light use, as sufficient leaf growth would occur to allow carbohydrate production and complete the growth cycle. Fall regrowth would occur in this pasture, completing the root growth and replacement, and the complete rest for one year after each year of use would facilitate grass vigor. Shrub use is anticipated to be minimal during this season of use.

Chimney Creek Pasture would receive early spring and fall/early winter use alternating with summer use under this alternative. Impacts to grass plants are likely to occur in areas of heavy

use, but not in areas of slight to light use during years when spring and fall/early winter grazing occurs. The split season would result in herbivory during both the spring growing season and the fall regrowth period. Because this split season use is followed by growing season and fall regrowth period rest the following year, grass vigor should be maintained. Shrub use is anticipated to be slight during the split season use, but increased use of shrubs is anticipated during the years of hot season use. However, cows do not normally make much use of sagebrush.

Use in Lower Fourmile Pasture rotates between summer/fall use one year and early spring and fall use (split season) in alternate years. The summer/fall use occurs during the dormant season for cool season grasses and the beginning of the fall regrowth period. Plants would be able to complete their growing cycle under this season of use and have some late fall regrowth. During the split season use, the impact to grasses and shrubs would be as described above for the split season for Chimney Creek Pasture.

Use in Upper Fourmile Pasture rotates between summer/fall use in one year and early spring use in alternate years, and horse use each year in early spring through mid-December. The complete growing season rest in the summer/fall use years followed by fall regrowth before the spring use years would allow the plants sufficient period to complete root growth and replacement. Utilization of shrubs is anticipated to occur in the years of summer/fall use. Horse use throughout the spring, summer, and all fall would have potential to impact vegetation in the vicinity of water sources through use during the growing season and fall regrowth period.

The extended AUM reduction in the Upper and Lower Fourmile pastures and closure due to the Wilson Complex Fire would benefit the vegetation and facilitate the fire rehabilitation process.

Winters Creek Seeding (crested wheatgrass seeding) would receive split season use each year during the spring and fall. Maintenance of

sufficient leaf area during the growing season and fall regrowth periods would be critical under this split season use.

Dry Creek Pasture would be rested in the years that Star Ridge Pasture is used. When Star Ridge Pasture is rested, Dry Creek Pasture would receive late winter use followed by early spring into summer use. The early spring/summer use each year has the potential to remove initial growing points and growing points as the grasses grow. This is anticipated to impact grass vigor and productivity near water sources or other areas of heavy use. Impacts to grasses are not anticipated for areas of slight or light use, as sufficient leaf growth would occur to allow carbohydrate production and complete the growth cycle. Fall regrowth would occur in this pasture, allowing new buds to form and root growth to be completed, and the complete rest for one year after each year of use would facilitate grass vigor. Shrub use is anticipated to be minimal during this season of use.

Range Improvements

Under this alternative, one well, 9.5 miles of pipeline, and four miles of riparian fence would be constructed. The surface disturbance associated with these range improvements would result in a short-term direct effect to vegetation through the removal of the vegetation. The construction SOPs in Appendix C would reduce this impact as limits on the extent of vegetation clearing and scheduling of construction activities during dry soil conditions would reduce impacts to vegetation. Trails along the new fence and radiating out from the new water development have the potential to result in isolated areas of vegetation damage along the narrow corridor. The duration of this effect would be determined by the time required for reseeding to establish, which could be three or more years for the herbaceous plants and ten or more years for shrubs.

The improved distribution of grazing is anticipated to improve grass and shrub vigor near the existing water sources by shortening the duration and intensity of grazing in these areas.

Non-Native, Invasive Species

The surface disturbance associated with the proposed range improvements would have potential for establishment by non-native, invasive species. The improved distribution of grazing would reduce potential for non-native, invasive species to establish in the areas that are currently receiving heavy use from livestock and wild horses. The proposed riparian fence would also be expected to reduce potential for non-native, invasive species establishment through recovery of the riparian vegetation. Livestock trailing along the new fences and from the new water sources has the potential to provide a suitable seedbed for new weed establishment.

3.4.1.2.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Under this alternative, the permitted livestock use of 27,879 AUMs represents a reduction of 2,276 AUMs from Alternative 1. However, the 27,879 AUMs permitted under this alternative would not be available until after the essential range improvements are constructed and the grazing under the interim grazing system has been demonstrated, through monitoring, that additional AUMs are warranted. The initial stocking level for the interim grazing system would be 23,247 AUMs. The interim grazing system would be the same as for Alternative 2. The proposed grazing system under this alternative is described in detail in Section 2.5.3.

Under this alternative, the riparian objectives on the South Fork Owyhee River within the Lower Fourmile and Star Ridge pastures would be obtained through changes in the proposed grazing system and with construction of the Dry Creek Well and pipeline, two pipeline extensions, and one pipeline extension from the existing Winters Creek Seeding Well.

Plant Productivity

The Star Ridge Pasture would receive early spring/summer use followed by a complete year of rest. The use during the majority of the growing

season would have potential to impact grass growth and carbohydrate production due to the early spring grazing and continuous growing season grazing, if utilization standards are exceeded. Impacts near water sources are anticipated under this alternative.

Chimney Creek Pasture would receive grazing use in late spring into summer in one year followed by fall use the next year. During the late spring into summer use year, the grasses would have carbohydrate production reduced, but would have the fall regrowth period and the following growing season to recover. During the fall use year, fall replenishment of the carbohydrates would be reduced, but the plants would have the following early spring to initiate growth without grazing. Therefore, impacts to grasses would be minimal under this alternative.

Use in Lower Fourmile and Upper Fourmile pastures would alternate among years from spring use in one year and complete rest the following year. Grazing during most of the growing season would have potential for early defoliation and some reduction in carbohydrate production. However, the grasses would have the fall regrowth and complete growing season/fall regrowth period the following year to recover. No impact to plant vigor is anticipated under this use pattern.

Winters Creek Seeding would receive late fall use in one year and fall/late fall use in alternate years. The grasses would have the entire growing season each year, and the fall regrowth period every other year to recover. Impacts to grasses are not anticipated under this pasture.

Dry Creek Pasture would receive summer/fall use in one year and summer use in alternate years. The grasses would have the full growing season every year and the fall regrowth period every other year to replenish the carbohydrate reserves and complete the growth cycle. Use on shrubs during the hot season would occur in this pasture. Impacts to shrubs would be anticipated to occur if utilization standards are exceeded.

Livestock trails radiating out from the new water development have the potential to result in isolated areas of vegetation damage along the narrow corridor.

Range Improvements

The impacts to vegetation from the construction of the range improvements would be the similar as for Alternative 2. The impacts to vegetation would be the same as described for Alternative 2, except the amount of surface disturbance would be greater, and therefore, the direct impacts to vegetation would be greater under this alternative. The indirect impacts would be similar to those described for Alternative 2. The establishment of the new water sources would result in new trails radiating out from troughs.

Non-Native, Invasive Species

The potential for establishment and spread of non-native, invasive species would be greater under this alternative than for Alternative 2 because of the additional surface disturbance for the pipelines and these areas are susceptible to establishment by non-native, invasive species. The new livestock trails resulting from the establishment of new water sources could provide suitable seedbeds for establishment of non-native, invasive species. The surface disturbance associated with the new troughs and pipelines would provide similar sites for non-native, invasive species establishment.

3.4.1.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, the permitted livestock use of 20,706 AUMs represents a reduction of 9,449 AUMs from Alternative 1. There would be no interim grazing plan necessary for this alternative. The proposed grazing system under this alternative is described in detail in Section 2.5.4.

Under this alternative, the riparian objectives on the South Fork Owyhee River within the Lower Fourmile and Star Ridge pastures would be

obtained through changes in the proposed grazing system.

Plant Productivity

Star Ridge Pasture would receive complete rest in one year and spring/early summer use in the alternate years. The continuous growing season use effect would be offset by the fall regrowth period and complete rest the following year.

Chimney Creek Pasture would receive summer and fall use each year, with the duration of use shorter in alternate years. The complete growing season rest each year and partial fall regrowth period in alternate years would limit impacts to the grass species. However, the hot season use each year has potential to impact shrub species. Sagebrush is the primary species in the pasture and use of sagebrush is limited at this time of the year.

Lower Fourmile Pasture would alternate between spring use and complete rest. The fall regrowth and year of complete rest would eliminate impacts to grass vigor under this alternative.

Upper Fourmile Pasture would alternate between a year of complete rest followed by late fall use. Grasses would have complete rest each year during the growing season and limited use one out of every two years during the fall regrowth period. Impacts to grasses and shrubs are not anticipated under this alternative.

The use in Winters Creek Seeding would be fall use each year, with the duration and time of the use varying between years. The crested wheatgrass would have complete growing season rest each year and some deferment of the fall regrowth period in alternate years. No impacts to the crested wheatgrass are anticipated under this system.

Dry Creek would receive use in early summer alternated with complete rest the following year. Impacts to grasses are not anticipated under this system.

Range Improvements

Under this alternative, none of the range improvements proposed under Alternative 2 or 3 would be constructed.

Non-Native, Invasive Species

The improved livestock distribution would lower overall use in the pastures and would reduce potential for non-native, invasive species to establish in the areas that are currently receiving heavy use from livestock and wild horses.

3.4.2 Wetlands/Riparian Zones

3.4.2.1 Affected Environment – Owyhee Allotment

The management framework with respect to wetland/riparian zones is provided in **Appendix B**.

Perennial stream flow is limited to the South Fork Owyhee River. The reaches of Fourmile and Winters creeks within the allotment are intermittent. Riparian vegetation is limited to a narrow corridor within South Fork Owyhee River Canyon and Fourmile Creek drainages and consists primarily of grasses, sedges, and rushes. Willows are located in portions of the South Fork Owyhee River Canyon and Fourmile Creek drainage. The reaches of Milligan and Chimney Creeks are ephemeral with essentially no known areas that provide riparian habitat within the Owyhee Allotment. The only exception would be limited riparian habitat where Chimney creek enters Desert Ranch Reservoir (Fourmile Creek provides bulk of flow).

Two springs occur within the allotment. Devils Corral Spring in Star Ridge Pasture is a sedge-dominated site that is in excellent condition. Bookkeeper Spring is located in Dry Creek Pasture and receives heavy use by wild horses.

3.4.2.2 Environmental Consequences

The Owyhee is used by cow/calf pairs, wild horses, and wildlife. The wild horses and wildlife

are present throughout the entire year. Livestock are on the allotment in various pastures for ten months each year (February through December). The limited distribution of water within the vast area of the allotment results in concentrations of wild horses, wildlife, and livestock at the water sources.

3.4.2.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Under this alternative, the rangeland health standards for riparian areas of the South Fork Owyhee River within the Fourmile Pasture and within the Star Ridge Pasture would not be achieved. Heavy livestock use has been attributed as the cause for not meeting the objectives at these sites. Similarly, the rangeland health standards for riparian areas would not be met at Bookkeeper Spring, but the cause has been attributed to wild horses.

3.4.2.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Under this alternative, the changes in grazing and the proposed range improvements for the Fourmile and Star Ridge pastures were developed to improve the riparian habitat conditions. The winter/spring use followed by complete rest in the Star Ridge Pasture would eliminate the hot season use that is generally the cause of riparian degradation. In the Lower Fourmile and Upper Fourmile pastures, hot season use would be alternated with spring and fall grazing in Lower Fourmile Pasture, and with spring use in Upper Fourmile Pasture. Due to alternate year hot season use, the recovery of the riparian vegetation would occur at a slower rate than is anticipated for the Star Ridge Pasture, but recovery is anticipated. The rangeland health standards for riparian areas would not be met at Bookkeeper Spring, but the cause has been attributed to wild horses.

The installation of one new well and pipeline within the Lower Fourmile Pasture would provide water sources to reduce grazing pressure on the upper portions of Fourmile Creek.

3.4.2.2.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Under this alternative, the grazing system would be the primary means of reducing grazing on the South Fork Owyhee River. The alternating growing season rest and growing season use would eliminate hot season use of the riparian vegetation in the Star Ridge Pasture. A similar alternating of spring use with rest the following year in the Lower Fourmile and Upper Fourmile pastures would also eliminate hot season use of the riparian vegetation.

However, continued use of Bookkeeper Spring and riparian area by wild horses throughout the hot season is anticipated to continue.

3.4.2.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, the riparian objectives for the South Fork Owyhee River within the Lower Fourmile and Star Ridge pastures would be obtained without constructing the proposed fence in the Lower Fourmile Pasture.

Grazing in the Lower Fourmile and Star Ridge pastures would alternate between complete rest and spring or spring/early summer grazing to eliminate hot season use in these pastures with riparian vegetation. Similarly, the hot season use in the Upper Fourmile Pasture would be eliminated by alternating use between complete rest and late fall grazing. The result would be recovery of the riparian vegetation, albeit at a slower rate than if the riparian fences were installed. The rangeland health standards for riparian areas would not be met at Bookkeeper Spring, but the cause has been attributed to wild horses.

3.4.3 Avian Sensitive Species

3.4.3.1 Affected Environment

The management framework with respect to avian sensitive species is provided in **Appendix B**.

Based on the Minute Order issued by Judge McKibben, the species for which analyses were required included northern goshawk, golden eagle, short-eared owl, long-eared owl, burrowing owl, ferruginous hawk, Swainson's hawk, prairie falcon, and peregrine falcon. **Map 3-9, Appendix A** shows where these raptors have been sighted. The map also shows that sage grouse also occur throughout the allotment.

Northern goshawk is only an occasional winter visitor to the allotment and ferruginous hawk is also an occasional visitor. No suitable nesting habitat for goshawk occurs within the allotment. Due to its occasional winter visitor status, impacts to this species from the various alternatives would be minor, and this species is not considered further in the analysis. Similarly, ferruginous hawk nesting habitat is limited in the allotment to rock pillars. The major limiting factor for this species on the allotment is availability of suitable nesting sites, not prey abundance. Therefore, ferruginous hawk is not considered further in the analysis.

Habitat descriptions for the raptors and sage grouse are included in Section 3.2.3.1.

Swainson's hawks likely nest in the mature willows or rock ledges within the allotment and on private lands adjoining the allotment. They forage at hayfields and over the sagebrush within the native pastures.

Prairie falcons are known to nest in high densities in the Star Ridge and Fourmile pastures in the cliffs overlooking the South Fork Owyhee River. The expanse of sagebrush surrounding the canyon provides the foraging habitat for this species.

Long-eared owls use the older age class willow on South Fork Owyhee River and Fourmile

Creek. Foraging habitat would be limited primarily to the Star Ridge and Fourmile pastures.

Burrowing owls could potentially occur throughout the allotment where sagebrush occurs and in areas where sagebrush borders grasses or upland meadows.

Twelve sage grouse leks have been identified within the allotment as of 2005. Four occur in the Star Ridge Pasture, seven in the Dry Creek Pasture, and one occurs in the Winters Creek Seeding Pasture. Nesting, early (upland) brood-rearing, and fall/winter habitat occurs throughout the allotment. Late (riparian/meadow) brood-rearing habitat is primarily limited to the South Fork Owyhee River, the Fourmile Creek drainage (mainly private lands), and two spring areas on public lands. It is highly likely that broods move off the allotment to riparian areas and meadows on public and private lands, as succulent vegetation desiccates on upland areas.

3.4.3.2 Environmental Consequences

3.4.3.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Raptors

No direct impacts to the raptor species were identified. Most of the nesting takes place on cliffs and rock outcrops in the South Fork Owyhee River Canyon, areas not used by livestock. Burrowing owls nest in burrows and may have some vulnerability to trampling by livestock that would cause collapse of the burrow. This would be a rare event. The other raptors nest on ledges and other locations not likely to be impacted directly by livestock grazing.

The use of the rangeland habitats within the allotments by Swainson's hawks and prairie falcons is primarily for foraging – hunting for prey. The sagebrush vegetation supports jackrabbit populations, and ground squirrel populations are common in the sagebrush openings where fires or vegetation treatments have occurred. Other prey, such as birds, snakes, and small rodents,

are common within the allotment. Under this alternative, some reduction in the quality of habitat for prey species has occurred, especially in the sagebrush plant community where shrub density has been a cause of herbaceous plant decline due to competition. The increase in shrub density and stature also makes it more difficult for raptors to capture prey. However, there is no evidence that the prey base is limiting the populations of these raptors.

The impacts to riparian vegetation have resulted in degradation of habitat for the long-eared owl, and short-eared owl, as well as habitat of prey species for the other raptors.

Sage Grouse

Of the twelve sage grouse leks known to occur within the allotment, four occur in the Star Ridge Pasture, and seven are in the Dry Creek Pasture. Data collected during 2005 lek inventories in the Owyhee Allotment resulted in an increase of 37 sage grouse over the 2000 lek inventories on the same seven leks. Although these lek inventories do not provide sufficient information to determine population trends, they are useful in determining the current status of the leks. In this case, all of the leks from 2000 were active in 2005.

Grazing in these pastures alternates between rest and early spring/summer grazing beginning on February 15 and continuing through June 30 (permitted until August 15, voluntary end of grazing by June 30). This coincides with the breeding season (March – May); therefore, there is opportunity for disruption of the lek activity by livestock in alternate years. Nesting habitat also occurs in these pastures and the spring grazing may remove nesting cover. However, residual cover from the cessation of grazing by June 30 and the alternate year complete rest is available under this system. Direct impacts to sage grouse nesting cover are not anticipated under this alternative. Because the grazing overlaps with the nesting season, potential exists for nest destruction through trampling, but this would be a rare event and considered incidental.

Summer brood habitat, consisting of riparian vegetation adjacent to sagebrush cover may be the limiting factor for this allotment. The playa areas within the allotment have been sites of brood observations in the past. Use of the steep canyon bottoms by sage grouse is not likely. However the meadow and riparian areas along portions of South Fork Owyhee River, Fourmile, Winters, and Chimney creeks, and the springs within the allotment provide some summer brood habitat. Impacts to the riparian areas from hot season use by livestock and wild horses have degraded the riparian areas and one of the spring areas. The quality and quantity of summer brood habitat would continue to be impacted under this alternative.

3.4.3.2.2 Alternative 2 – Implement the Multiple Use Decision as Modified

Raptors

Under this alternative, no direct impacts to raptors are anticipated (see Alternative 1 above). The proposed grazing system is anticipated to improve shrub and grass productivity through the implementation of rest rotation, improved livestock distribution, and protection of riparian areas. An increase in shrub and grass vigor would increase habitat quality for the prey species, which would indirectly improve foraging conditions for the raptors.

Sage Grouse

Under this alternative, grazing would occur in the Star Ridge and Dry Creek pastures in late winter and spring/summer, followed by a year of rest. This coincides with the breeding season (March – May); therefore, there is opportunity for disruption of the lek activity by livestock in alternate years. Nesting habitat also occurs in the pasture and the spring grazing may remove nesting cover. However, residual cover from the cessation of grazing by June 30 and the alternate year complete rest is available under this system. In addition, the maximum utilization level on key species is 50 percent and expansive areas of the pastures have been documented to have slight to

light use during livestock use pattern mapping near the documented leks. Direct impacts to sage grouse nesting cover are not anticipated under this alternative. Because the grazing overlaps with the nesting season, potential exists for nest destruction through trampling, but this would be a rare event and considered incidental. Construction of the riparian fence would improve the condition of the riparian habitat adjacent to the Owyhee River, increasing the suitability of this area for sage grouse. Impacts to sage grouse from collision with the riparian fence are not anticipated due to the SOPs that would set the fence back from the riparian area and increase the visibility of the fence. The only proposed barbed wire fencing would be several miles away from any documented sage grouse leks and away from riparian habitat that provides late summer brood rearing habitat. The location of the proposed fence was surveyed for sage grouse leks in 2004 and none were located.

Similarly, grazing would occur in Dry Creek Pasture in late winter and continue through July 31, followed by complete rest the next year. The removal of nesting cover would occur, but as with Star Ridge Pasture, residual cover would be available from the rested year. Nest trampling would be considered incidental.

Hot season use in Lower and Upper Fourmile Pastures during alternate years with spring and fall grazing (in Lower Fourmile Pasture) would coincide with sage grouse use of riparian areas within these pastures one out of every two years. The range improvements proposed to protect the riparian habitat would be constructed with measures to mitigate the effects of fence construction on wildlife, including sage grouse. These SOPs would be critical to eliminating potential impacts to sage grouse summer brood habitat.

Bookkeeper Spring would continue to receive hot season use by wild horses and this area of summer brood use would not improve under this alternative.

3.4.3.2.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

Raptors

Under this alternative, no direct impacts to raptors are anticipated (see Alternative 1 above). The proposed grazing system is anticipated to improve shrub and grass productivity through the implementation of rest rotation and improved livestock distribution. An increase in shrub and grass vigor resulting from the implementation of the grazing system would increase habitat quality for the prey species, which would indirectly improve foraging conditions for the raptors. However, the areas of dense sagebrush are not likely to see much improvement due to changes in the grazing system. The plant competition between shrubs and herbaceous species is the major factor causing lowered species composition of forbs and grasses, as well as lowered production of these herbaceous species. The continued lack of herbaceous vegetation in these sagebrush stands would limit prey populations that depend on the herbaceous cover, herbaceous forage, and/or seeds produced by the herbaceous plants.

Sage Grouse

Star Ridge Pasture would receive spring use alternating with complete rest under this alternative. The spring use would coincide with sage grouse breeding activities, and impacts would be similar to those described for Alternative 2. With opening of new grazing areas as a result of water development, the impacts associated with spring use to sage grouse breeding activities would be similar to those for alternative 2, but would be over a larger area of the Star Ridge Pasture.

Dry Creek Pasture would receive summer and fall use alternating with summer use under this alternative. Potential for disruption of sage grouse breeding or nesting activities would not occur in this pasture under this system.

The Upper and Lower Fourmile pastures would receive spring use alternating with complete rest under this alternative. This would eliminate impacts to sage grouse summer brood use by avoiding hot season grazing of the riparian areas. Chimney Creek Pasture would receive summer use alternating with fall use, which would also improve summer brood habitat for sage grouse.

Bookkeeper Spring would continue to receive hot season use by wild horses and this area of summer brood use would not improve under this alternative.

3.4.3.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Raptors

Under this alternative, no direct impacts to raptors are anticipated (see Alternative 1 above). The proposed grazing system is anticipated to improve shrub and grass productivity through the implementation of rest rotation and improved livestock distribution. An increase in shrub and grass vigor would increase habitat quality for the prey species, which would indirectly improve foraging conditions for the raptors.

Sage Grouse

Star Ridge Pasture would receive spring use alternating with complete rest under this alternative. The spring use would coincide with sage grouse breeding activities, and impacts would be similar to those described for Alternative 2.

Dry Creek Pasture would receive summer use alternating with complete rest under this alternative. Potential for disruption of sage grouse breeding or nesting activities would not occur in this pasture under this system.

The Upper Fourmile Pastures would receive fall use alternating with complete rest and Lower Fourmile Pasture would receive spring use alternating with complete rest under this alternative. This would eliminate impacts to sage grouse summer brood use by avoiding hot season grazing of the riparian areas.

Chimney Creek Pasture would receive summer/fall use each year. However approximately ten percent of the Fourmile drainage is within this pasture with a large portion inaccessible to livestock due to rocky terrain. The remaining 90 percent of the Fourmile Creek is within the Upper and Lower Fourmile pastures which would both get rest alternated with deferred use. Under this proposed two-year grazing system alternative there is the potential in Year 1 to use Winters Creek Seeding (crested wheatgrass) and Chimney Creek Pasture in June and July, and Dry Creek Pasture during the August to mid November period. Use in Chimney Creek and Winters Creek Seeding would be switched with Dry Creek (i.e., deferment of Dry Creek until after seed ripe). Factors to consider are water availability projected to allow cattle use on Dry Creek during the August 1 to November 15 period under a “wet year” scenario and any pro-rate of AUMs between the allotments to adjust to carrying capacities. This would reduce potential impacts to sage grouse during the breeding and nesting season in Dry Creek Pasture. It could also reduce livestock impacts to riparian areas on Fourmile Creek drainage.

This alternative also includes vegetation treatments that would open up some of the large, dense stands of sagebrush. The resulting mixture of sagebrush, perennial grasses, and forbs would improve habitat for sage grouse. Dense stands of sagebrush are not used for breeding displays (i.e., strutting) and the increase in forbs may attract hens with broods. A mix of open areas, as a result of mowed vegetation treatments, surrounded by untreated denser cover have been observed to immediately provide winter night roosting areas for several flocks of sage grouse in separate groups over several miles. The open treated areas have also been documented to allow for maintenance of a lek area where big sagebrush and rubber rabbitbrush (taller statured shrubs) growth could eventually compromise use of the lek. The treatment areas were also used as loafing areas by male grouse in the latter part of the morning after the early morning lek period. One important aspect of the vegetation treatments include the effects as fuel breaks

through reduction of fuel loads and flame lengths associated with dense shrubs. These treatment actions, in combination with allowing anchor points for firefighters or areas for aerial retardant drops, helps to reduce the potential for catastrophic wildfires. Many present day catastrophic wildfires in northeastern Nevada (allotment area) burn in block burn configurations that leave little or no brush cover over thousands of acres. The lack of sagebrush cover over thousands of acres is a potential critical limiting factor for sage grouse populations.

Bookkeeper Spring would continue to receive hot season use by wild horses and this area of summer brood use would not improve under this alternative.

3.4.4 Conservation/ Mitigation Recommendations and Residual Impacts

3.4.4.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

No conservation or mitigation recommendations for vegetation have been made for Alternative 1. This alternative represents the system which was evaluated in the allotment evaluation process and Alternative 2 was developed to make the necessary changes required to meet rangeland health standards and allotment objectives.

Mitigation would include annual inspection of the spring areas and treatment, as necessary, of non-native, invasive species.

Residual impacts under this alternative include non-achievement of rangeland health standards for the upland sites and riparian sites. Shrubs and grasses would continue to suffer the effects of early spring defoliation, heavy utilization near water sources, and repeated hot season use. Non-native, invasive species would continue to spread throughout the allotments where livestock concentrate and where wild horse impacts occur.

Residual impacts would include heavy to severe use of the riparian areas and potential for non-native, invasive species to establish at the spring

and riparian sites and displace the riparian vegetation.

Under this alternative, impacts to the riparian habitat at riparian areas would continue as an ongoing and residual impact to sage grouse.

The non-attainment of rangeland health standards at Bookkeeper Spring would be a residual impact due to wild horse use during the hot season.

3.4.4.2 Alternative 2 – Implement the Multiple Use Decision as Modified

The additional water sources proposed under this alternative have potential to create occasional additional heavy to severe use areas in the vicinity of these new water sources. Mitigation would include monitoring for non-native, invasive species at these sites and either treatment of infestations or seeding species suitable to the site and use levels. The other range improvements proposed also have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Under this alternative non-native, invasive species would continue to establish within the allotments, albeit at reduced rates than under the current management system. Mitigation for the impacts of the range improvements would include annual spring inspection of the trough areas to detect and subsequently treat noxious weeds and other non-native, invasive species. Early detection and treatment each year would prevent the undesirable species from completing their growth cycle, thus reducing the production of seeds that could be transported to other sites within or beyond the allotments.

A second mitigation measure would include seeding those areas receiving heavy use each year, as necessary, with desired perennial grass species such as Great Basin wildrye, crested wheatgrass, or other perennial grass that can better withstand the effects of concentrated

livestock use at the water troughs. This would reduce the potential for non-native, invasive species to dominate the site, especially if annual treatment of noxious weeds is conducted.

Seasonal restrictions should be implemented with respect to construction of range improvements near known raptor nesting sites.

Manage suitable meadows for dense ground cover during the nesting season for short-eared owl nesting habitat and prey habitat.

Residual impacts under this alternative would include potential for non-native, invasive species to establish and spread within the allotments as a result of trailing along newly constructed fences or to water sources.

Bookkeeper Spring would continue to receive hot season use by wild horses and this area of summer brood use would not improve under this alternative.

3.4.4.3 Alternative 3 – Permit Grazing Without Riparian Enclosures and Vegetation Treatments

The additional water sources proposed under this alternative have potential to create additional heavy to severe use areas in the vicinity of these new water sources. Mitigation would include monitoring for non-native, invasive species at these sites and either treatment of infestations or seeding species suitable to the site and use levels. The other range improvements proposed also have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Treatment for non-native, invasive species would be mitigation for the impacts to riparian vegetation. The continued use of these areas would exacerbate the already existing infestations of non-native, invasive species. Treatment, followed by seeding with species suited to the site would reduce the impact to the riparian areas.

Seasonal restrictions should be implemented with respect to construction of range improvements near known raptor nesting sites.

Manage suitable meadows for dense ground cover during the nesting season for short-eared owl nesting habitat and prey habitat.

A residual impact would include heavy to severe use of the riparian areas and potential for non-native, invasive species to establish at riparian areas and displace the riparian vegetation.

A residual impact under this alternative would include non-native, invasive species expansion within upland areas.

Under this alternative, impacts to the riparian areas would continue as an ongoing and residual impact to sage grouse.

3.4.4.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

The range improvements proposed have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Treatment for non-native, invasive species would be mitigation for the impacts to riparian vegetation and upland sites near water sources. The continued use of these areas would exacerbate the already existing infestations of non-native, invasive species. Treatment, followed by seeding with species suited to the site would reduce the impact to the riparian areas.

Seasonal restrictions should be implemented with respect to construction of range improvements near known raptor nesting sites.

Manage suitable meadows for dense ground cover during the nesting season for short-eared owl nesting habitat and prey habitat.

Residual impacts under this alternative would include potential for non-native, invasive species to establish and spread within the allotments.

A residual impact under this alternative would be the potential long-term change in species composition due to the repeated use of Chimney Creek Pasture at the same time each year.

3.4.5 Cumulative Effects

3.4.5.1 Past Actions

The remote location of the Owyhee Allotment has limited the human activity on the allotment. Livestock grazing has been the major land use since the 1860s.

During this period from 1860 to 1940 the perennial native grasses were greatly reduced and sagebrush and other shrub species increased in dominance (Young et al. 1979). With these historic levels of livestock use, the time, duration, and intensity of grazing exceeded the ability of the plants (both grasses and some shrubs) to maintain plant vigor through the constant removal of photosynthetic tissue and growing points at all times of the year. By 1890, shrubs dominated most of the western rangelands (Young et al. 1979). By the early 1900s, the forest preserves were established, which were precursors to the national forests. As these forest preserves were established, restrictions were placed over the nomadic sheep operations and some relief of grazing intensity began.

Most of the early range improvements implemented by the BLM were designed to increase livestock forage and stabilize soils and the actual results of these projects were mixed. Halogeton control was also an issue and crested wheatgrass, a non-native species was introduced as one means of replacing halogeton with a forage species. While there were benefits to prey species and sage grouse through the conversion from halogeton to perennial grasses, the non-native species and the monocultures that were produced had the immediate effect of creating non-habitat. As shrubs and native species established over time (30 or more years in many cases), the habitat values returned and many birds and small mammals, as well as sage grouse can be found in older seedings that have a

mixture of sagebrush, native grasses and forbs, and crested wheatgrass.

In addition to the initial impact of grazing on the native grasses and the substitution of crested wheatgrass for native grasses, a subtle but more profound and lasting effect of grazing was a change in the fire ecology of Great Basin rangelands. During the initial overstocking of the rangelands, grasses were grazed to the extent that there was insufficient fuel to carry lightning-ignited fires. In many instances the shrubs were too widely spaced for fires to burn large acreages. This reduction in natural fires allowed shrub species to increase in stature and density by eliminating the low to moderate intensity fires that formerly kept the rangeland open in more of a grass dominated or grass-shrub mixture. In the absence of these low to moderate fires, shrub dominance became common. By the 1940s and 1950s, shrub dominance was such an issue that large acreages of sagebrush were subject to aerial spraying of herbicides to promote grass growth. Conversion of sagebrush to crested wheatgrass through use of the rangeland plow and seeding with rangeland drills was common in the 1960s, 1970s, and 1980s (Rich 1999, Miller and Eddleman 2000). These vegetation treatments added to the discontinuity in fuels and added to the reduction in fires.

By the 1960s the shrub density was sufficient that the fine fuels (grasses) were no longer needed to carry fires in much of the Great Basin rangelands and large, shrub-fueled fires began to occur. Due to the intensity of these fires, most of the perennial species were destroyed and cheatgrass, which was introduced in the late 1800s or early 1900s, began to expand and dominate many of the low elevation, low precipitation zone areas. This annual species has increased the frequency of fires where it exists, which prevents shrubs from re-establishing. Therefore, livestock grazing, in combination with introduced species and vegetation treatments have resulted in an altered fire regime. Increased fire return intervals through the 1900s from grazing levels that removed the fine fuels, allowed shrubs to dominate the landscape and

cheatgrass to invade native range. Once the shrubs reached a critical fuel threshold, large, high intensity fires began to occur that resulted in many areas converting to annual grasslands. Initially the shrub build up provided habitat for sage grouse, but as the understory grasses and forbs declined and shrubs dominated, the critical nesting, pre-laying, and early brood habitats declined in abundance. The fires that followed eliminated many acres of sage grouse habitat, as well as habitat for the prey species on which the raptors depend.

As indicated in the Allotment Evaluation (BLM 2000c) there have been at least 23 wildland fires documented on the Owyhee Allotment during the period 1980 to 1996. Most of the fires were small in size (i.e., less than 50 acres), but several fires were greater than 375 acres, with an average of 1,720 acres in size. The Three Mile Fire in 2000 burned approximately 3,400 acres and the 2005 Wilson Complex Fire burned approximately 22,000 acres within the allotment (**Map 3-3**).

Where sagebrush has increased in density and cover, competition between shrubs and grasses increased the stress on the grass plants. The ability of shrubs to acquire soil moisture and nutrients is greater than the ability of grasses. Where grazing adds to the stress on grasses by depleting root reserves, the decline in grass abundance is accelerated. Periodic treatment of the vegetation, combined with seeding native perennial grasses when necessary, would offset the change in fire ecology that has eliminated the low to moderate intensity fires that kept the sagebrush community productive. This has had an overall impact on the productivity of many range sites, which has likely resulted in less prey species through loss of herbaceous forage and seed abundance. Similarly, this loss of various age classes and structure of the sagebrush community has resulted in less pre-laying, nesting, and early brood habitat for sage grouse.

The build up of the wild horse population within the HMA has also contributed to the current condition of the springs and upland vegetation. An emergency gather on the Dry Creek Pasture in 2000 resulted in the removal of 612 wild

horses. A gather from the Star Ridge Pasture in 2002 removed 495 wild horses. These removals reduce impacts, but only until wild horse populations recover to previous levels.

3.4.5.2 Present Actions

Because of the remote location, current land uses on the allotment are primarily livestock grazing, dispersed recreation, and wildlife habitat. Water developments (guzzlers) for wildlife have been installed in the past ten years to provide stable water sources for pronghorn antelope and a variety of other wildlife species.

The Wilson Fire and subsequent closure to grazing and rehabilitation efforts have also occurred within this allotment. The effects of large fires on habitat for sage grouse and prey species for raptors is also being addressed through fuels management treatment projects.

3.4.5.3 Reasonably Foreseeable Future Actions

As discussed in detail in Section 3.7.3.2, the reasonably foreseeable future actions within the allotment include continued livestock grazing and associated range improvements, fire suppression and rehabilitation efforts, fuel hazard reduction treatments, military air flights, and construction of a boat launching site on the South Fork Owyhee River.

The continuation of grazing under Alternatives 2, 3, or 4 would be anticipated to improve the general condition of the range. Alternative 3 would not provide for improvement of one spring and riparian vegetation. Non-native, invasive species would be anticipated to continue to be present in the allotments, but the rate of increase is likely to be less under Alternatives 2 and 4.

Overall improvement of the habitat for sage grouse and raptor prey species is anticipated under Alternatives 2 and 4, and improvement of only the uplands is anticipated under Alternative 3.

Fire suppression and burned area emergency rehabilitation are likely to continue. This is likely to reduce the changes in the plant community due

to large fires (i.e., fire suppression should limit the size of the fires), but also result in somewhat less diverse communities in the short-term (i.e., the fire rehabilitation seed mixes generally only include a few species).

Increased human use would result if the BLM boat launching site is developed and has the potential to increase non-native, invasive species on the allotment, especially in the riparian area associated with the South Fork Owyhee River.

The incremental impact of the proposed changes in grazing use and construction of range improvements would not result in significant cumulative adverse effects. Under all alternatives, environmental conditions would largely improve and the potential losses of habitat resulting from fire suppression and rehabilitation and fuel hazard reductions would be largely offset. The conversion of habitat and redistribution of habitat components resulting from fire suppression and fire rehabilitation activities would complement the improvements anticipated from implementing the proposed action or alternatives as the negative effects of wildfire are mitigated. The cumulative impact of constructing the proposed essential range improvements would be positive as implementation of SOPs contained in Appendix C would reduce or eliminate several potential impacts.

The military air flights have restrictions for elevations to limit impacts, and the boat launching site is not likely to add to the cumulative effects.

On balance, the cumulative effects of the proposed action and the past present and reasonably foreseeable future actions do not result in significant impacts to the human environment.

3.5 Irreversible/Irretrievable Commitment of Resources

None of the actions proposed for the alternatives analyzed in this EIS represent an irreversible or irretrievable commitment of resources. Each of the grazing management systems could be

changed at a future date if the system is demonstrated as not achieving significant progress toward rangeland health standards. Similarly, the proposed range improvements could be removed, with the exception of the seedings (vegetation treatments), which generally represent a long-term change in the vegetation. However, the native vegetation could be restored, at considerable cost, if necessary.

3.6 Relationship Between the Local Short-Term Use of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term is defined as the period of time between the current allotment evaluations (2000) and the next evaluation, a period of 10 to 20 years. Long-term is defined as beyond the short-term period (i.e., greater than 20 years).

The short-term use of these allotments under Alternatives 2, 3, and 4 would have the overall impact of eliminating or reducing the effects of grazing on the plant communities within the allotments. Consequently, the short-term use of the human environment would enhance the long-term productivity of the public lands. The allotment evaluation process and allotment monitoring are means of assessing the short-term use of the allotments with respect to long-term rangeland health standards and short- and long-term allotment-specific objectives.

Improvement of the rangeland health would have an overall positive benefit to the avian sensitive species which were the subject of this EIS. While some residual impacts to these species from the proposed management remain, the iterative nature of the allotment evaluation process allows for evaluation of the progress being made toward the rangeland health and allotment-specific objectives, and to address some of the residual impacts in the next evaluation cycle.

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4.0 CONSULTATION AND COORDINATION

4.1 Public Scoping

Public involvement is an important and necessary component of the NEPA process. Section 1.5 and Table 1-1 include a summary of the issues and concerns identified during the scoping process for the EIS.

A Notice of Intent (NOI) to prepare the EIS was published in the Federal Register on December 17, 2004. This NOI initiated the formal public scoping period and invited the public to provide scoping input for the EIS during a 30-day scoping period. The public scoping period ended on January 18, 2005.

On January 12, 2005 a public meeting was held in an open house format at the BLM field office in Elko, Nevada located at 3900 East Idaho Street Elko, Nevada. Representatives from the BLM and NDOW were present to give an overview of the project and give information in addition to the displays and presentation. Interpretive booths were set up in order to provide information for the public and to allow the public to query the agency representatives on the various topics and issues that may be addressed in the EIS. The meeting was attended by 17 people. Scoping comment forms and requests to be placed on the mailing list were available.

Only four comment sheets and requests to be placed on the mailing list were received by the BLM from the public meeting. These comment sheets, as well as written comments received via mail and e-mail. The input received has been compiled in a Scoping Report that is on file and available for review during normal business hours at the BLM Elko Field Office. Individual comments were numbered within each letter. The specific comments within each submission were identified and screened to distinguish “issues” from other types of input (i.e., data sources, concerns, opinion, etc.). Comments received during the allotment evaluation process from NDOW were also considered as scope of this EIS was determined. BLM also received comments following the close of the public scoping period that were still considered to the extent they raised issues germane to complying

with the Minute Order. Many of the 148 comments/issues received from the public were determined to be beyond the scope of this EIS.

In making his ruling and issuing the Minute Order, the Honorable Judge McKibben indicated that the NEPA analysis completed for the MUDs was adequate for all resources except for the sensitive bird species identified in the Minute Order. The EIS focuses on the effects of grazing action from the MUDs and alternatives, including proposed range improvements, to determine potential impacts on sage grouse, burrowing owl, and the other sensitive raptors.

4.2 Coordination with Other Federal, State, and Local Agencies

During the course of the allotment evaluations and EAs, BLM coordinated with U.S. Fish and Wildlife Service with respect to species listed under the Endangered Species Act. As the state agency with jurisdiction and special expertise with regard to the management of wildlife populations in Nevada, NDOW has participated in preparation of this EIS as a cooperating agency.

4.3 Native American Consultation

As a federal agency with jurisdiction over the management of public lands in northeastern Nevada, the BLM is required to provide affected tribes an opportunity to comment and consult on proposed actions that may have impacts to tribal resources, activities, or interests. Federally recognized Tribes with interests in management of the Elko district are:

Te-Moak Tribe of Western Shoshone

(Elko, South Fork, Wells, and Battle Mountain Bands)

Duck Valley Sho-Pai Tribes of Idaho and Nevada

Duckwater Shoshone Tribe

Ely Shoshone Tribe

Fort Hall Shoshone-Bannock Tribes of Idaho
 Ibapah Goshute of Utah and Nevada
 Skull Valley Goshute of Utah
 Yomba Shoshone

Historically, tribes have participated in planning site-specific projects; but not in the allotment evaluation and multiple use decision process. The Draft EIS was provided to the various Tribal leaderships (i.e., Chair people and Councils) and their staffs, tribal groups, and individuals with interests within the Elko BLM Field Office's administrative boundary (see list of tribes noted above). Tribal representatives were invited to the public open house to discuss the Draft EIS. No comments were received on behalf of any of the tribes, so no change was made to BLM's analysis for Native American concerns (Section 3.1.2.2) in the Final EIS. As a result, BLM's analysis of Native American concerns is based on existing analyses from the environmental assessments for the Big Springs and Owyhee MUDs and information currently available to BLM's Native American Coordinator.

4.4 Public Review of the Draft EIS

The DEIS was filed with the Environmental Protection Agency (EPA) and distributed beginning December 2, 2005 to individuals, organizations, and agencies on the EIS mailing list. EPA's publication of their notice in the Federal Register on December 9, 2005 initiated a 45-day public review of the DEIS. The public comment period extended through January 24, 2006. In addition, a public meeting to discuss the Draft EIS, and to accept public comment was held on January 11, 2006.

As a result of public review, 40 comment letters were received from individuals, organizations, and agencies. **Table 4-1** lists the letters received. The public comment letters and the responses to comments are provided in **Appendix D, Volume II** of this EIS.

Of the 40 comment letters received, eleven were from the plaintiff in the case that led to the court order to prepare this EIS, Western Watersheds Project (WWP). BLM received a total of 450 comments within

the 40 letters and WWP accounted for 284 of these comments to which BLM responded. In addition, another 17 comment letters were received from individuals prompted by an on-line message that WWP transmitted from their website on January 19, 2006. These letters included 122 comments to which BLM responded, but most were identical comments.

The remaining comment letters were received from other environmental organizations, local, state, or federal government/agencies, and individuals (**Table 4-1**).

The public comments resulted in modifications to the EIS between the issuance of the Draft EIS and the Final EIS. The major changes are summarized as follows:

- Introduction of interim grazing systems in Sheep Allotment Complex and Owyhee Allotment, that include initial stocking levels based on average actual use;
- Modification of the existing interim grazing system of the West and East Big Springs allotments from that described in the 2002 FMUD;
- Addition of short-term key area objectives as terms and conditions on grazing permits, and disclosure of all allotment-specific objectives for the allotments;
- Categorization of proposed range improvement projects to distinguish those essential to the implementation of the proposed grazing systems from projects that would facilitate the grazing system;
- Introduction of more site-specific analysis of the essential range improvement projects, including incorporation of standard operating procedures for construction;
- Modification of analysis of impacts of projects by allotment due to changes in proposed projects resulting from classification of essential versus non-essential projects;
- Expansion of analysis of cumulative impacts, including those projects that would facilitate

implementation of the amended grazing
decision for the Sheep Allotment Complex,

Table 4- 1: Public Comment Letters on the Draft EIS

Letter No.	Date	From	No. of Comments	No. of Pages
PC-1	1/21/06 e-mail	Andrew J. Orahosk, Eugene, OR	9	2
PC-2	1/24/06 e-mail	Craig C. Downer, Minden NV	5	1
PC-3	1/11/06	Larry L. Schutte, Jerry Goodwin, Tonopah NV	3	11
PC-4	1/24/06 e-mail	Wayne Y. Hoskisson, Moab UT	12	14
PC-5	1/20/06	Elko Board of Commissioners Robert Stokes, Elko NV	1	1
PC-6	1/23/06 e-mail	Ginger Harmon, Ketchum ID	2	1
PC-7	1/21/06 e-mail	Bob Brister, Salt Lake City UT	4	1
PC-8	1/20/06	Great Old Broads for Wilderness Veronica Egan, Durango CO	9	2
PC-9	1/20/06 e-mail	Karen Klitz, Berkeley CA	8	2
PC-10	1/20/06 e-mail	"micoad"	4	1
PC-11	1/20/06	Mary V. Jones, Lewiston MT	5	1
PC-12	1/21/06	Richard Artley, Grangeville ID	10	7
PC-13	1/20/06 e-mail	Randall Breeden	9	1
PC-14	1/23/06 e-mail	Gail Fox, Bloomsburg PA	5	1
PC-15	1/24/06	Nevada Cattlemen's Association Boyd M. Spratling, Elko NV	5	1
PC-16	1/13/05 e-mail	Jim Cristison, Golconda NV	1	3
PC-17	1/24/06	U.S. Environmental Protection Agency, Region IX Duane James, Summer Allen, San Francisco CA	5	2
PC-18	1/23/06	Ellison Ranching Company, William Hall, Tuscarora NV	8	3
PC-19	1/24/06	Matthews and Wines, P.C. Elko NV Robert J. Wines, attorney for Big Springs Ranch, LLC	2	1
PC-20	12/21/05 e-mail	B. Sachau, Florham Park NJ	4	1
PC-21	1/19/06 e-mail	Lydia Garvey, Clinton OK	9	1
PC-22	1/22/05	Western Watersheds Project, Katie Fite, Boise ID	1	2
PC-23	1/14/06 e-mail	Katie Fite, Western Watersheds Project, Boise ID	6	6
PC-24	1/24/06 e-mail	Katie Fite, Western Watersheds Project, Boise ID	18	21
PC-25	1/24/06 e-mail w/ encl	Katie Fite, Western Watersheds Project, Boise ID encl – 1/22/06 letter	25	8
PC-26	1/22/06 e-mail	Katie Fite (encl - 1/21/06 letter w/ Milk River Study)	2	2
PC-27	1/9/06 e-mail	Katie Fite, Western Watersheds Project, Boise ID "Travel Planning, Spruce, SSSS EIS"	6	4
PC-28	1/24/06 e-mail	Katie Fite, Western Watersheds Project (encl-1/23/06 letter)	31	38
PC-29	1/23/06 e-mail	Katie Fite, (encl -Pygmy rabbit petition; Merriam expedition)	1	10
PC-30	1/23/06	Western Watersheds Project, Committee for High Desert and Oregon Natural Desert Association	188	65
PC-31	1/21/06 e-mail	Katie Fite (encl – Dr. John Carter excerpt, pp 7-15)	1	11
PC-32	1/30/06	Terrell Rich, Boise ID	4	3
PC-33	1/23/06	Toiyabe Chapter Sierra Club, Rose Strickland, Reno NV	12	2
PC-34	1/23/06 e-mail	Barbara Adams, Parker CO	1	1
PC-35	1/23/06	Nevada State Clearinghouse, Carson City NV Brandi Marthen, Division of Water Resources	1	3
PC-36	1/21/06	Van Hyning & Assoc., Great Falls MT	9	2
PC-37	1/30/06	Raymond E. Bowden, Emmett ID	1	2
PC-38	12/20/05 e-mail	Katie Fite	5	1
PC-39	1/20/06 e-mail	"Bill – America's Bookshelf"	9	3
PC-40	1/25/06 e-mail	Michael 'Buffalo' Mazzetti, Tonasket WA	9	3

Letter No.	Date	From	No. of Comments	No. of Pages
TOTALS			450	245

Big Springs, and Owyhee allotments; and

- Incorporation of additional alternatives considered but eliminated from detailed analysis.

Ely Shoshone Tribe, Dianna Buckner – Chair
 Confederated Tribes of the Goshute, Amos Murphy – Chair

4.5 Distribution List

The Draft EIS was distributed to various governmental agencies, organizations, and individuals. A list of the agencies, organizations, and individuals who were sent copies of the Draft EIS is presented below. In addition, those that commented on the Draft EIS were added to the list (indicated in *italic font*).

Federal Agencies

Air Force Regional Environmental Office
 U.S. Fish & Wildlife Service
 BLM Ely Field Office
 U.S. Forest Service
 Environmental Protection Agency
 Nevada BLM State Office

State Agencies

Nevada Department of Wildlife
 Nevada State Clearinghouse Department of Admin.
 Nevada Division of Agriculture

Elected Officials

Elko Board of County Commissioners
 The Honorable Representative Jim Gibbons
 The Honorable Senator Harry Reid
 The Honorable Senator John Ensign

Tribal Organizations

Elko Band Council, Hugh Stevens – Chair
 Duck Valley Sho-Pai Tribe, Terry Gibson - Chair
 Wells Band Council, Kristi Begay - Chair
 Temoak Tribal Council, Hugh Stevens - Chair
 Battle Mountain Band Council, Joseph Holley - Chair
 South Fork Band Council, Ronnie Woods - Chair
 Duckwater Shoshone Tribe, Jerry Millet – Chair
 Yomba Shoshone Tribe, Lisa Cagle – Chair
 Western Shoshone Committee, Reggie Premo

Organizations

Advocates for the West
Commission for the Preservation of Wild Horses
Colorado Wild Horse & Burro Coalition
Friends of Nevada Wildlife Attn: Tom Myers
Friends of Nevada Wilderness
Hawkwatch International, Inc
Nevada Outdoor Recreation Association
Committee for the High Desert/Western Watersheds
Project
Sierra Club
The Wilderness Society Attn: Sara Barth
Wild Horse Organized Assistance
Natural Resources Defense Council
Red Rock Audubon Society
Nevada Cattleman's Association
Nevada High Country Tours
Red Rock Audubon Society
National Mustang Assn. Inc.
Fund for Animals
Wilderness Impact Research Foundation
Great Old Broads for Wilderness

Businesses

Bank of Utah
H & R Livestock
Holland & Hart, LLP
Landfinder Country Properties
Ellison Ranching Company
Resource Concepts, Inc.
HTT Resource Advisors
Doby George LLC
Nevada Land & Resource Company
Vidler Water Company
Parasol Ranching LLC Big Springs Ranch
Newmont Gold Corporation
Independence Valley Ranch LLC
Big Springs Ranch LLC, The Star Living Trust
Darrel Kippens and Sons
Matthews and Wines PC
Van Hyning & Associates, Inc.
Chournos, Inc
Pine Valley Sheep Ranch, Inc

Individuals

Roger Scholl

Robert McGinty

Varlin Higbee

Charles and John Young

Martha P. Hoots

Scott Egbert

Sherie R. Goring

Jeffrey O. Roche

David D. Morris

Lydia Garvey

Randall Breeden

Karen Klitz

Andrew Orahoske

Richard Artley

Bob Brister

Ginger Harmon

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Carol Marchio	Soil, Water, and Air
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Kristine Dedolph	GIS

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Angel Nicholson	Biological Technician
Cari Anderson	Drafting

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6.0 REFERENCES

- American Ornithologists' Union, Committee on Classification and Nomenclature. 1983. Check-list of North American Birds. Sixth Edition. American Ornithologists' Union, Allen Press, Inc., Lawrence, KS.
- Aqua Engineering. 2000. Drinking Water Source Protection Plan for the City of West Wendover.
- Autenrieth, R.E. 1981. Sage grouse management in Idaho. Idaho Department of Fish and Game Wildlife Bulletin 9.
- Baglien, J. W. 1975. Biology and habitat requirements of the nesting Golden Eagle in southwestern Montana. Master's thesis, Montana State Univ., Bozeman.
- Barrington, M.R., and G.N. Back. 1984. Sage grouse research: population dynamics. P. 43-46. *In*: P.C. Lent and R.E. Eckert, Jr. (eds.). Progress report for 1983, Saval Ranch Research and Evaluation Project. Univ. Nevada Reno, Renewable Resource Center, Reno, NV.
- Batterson, W.M., and W.B. Morse. 1948. Oregon Sage Grouse. Oregon Game Comm., Portland. Oregon Fauna Serv. 1.
- Bechard, M.J., R.L. Knight, D.G. Smith, and R.E. Fitzner. 1990. Nest sites and habitats of sympatric hawks (*BUTEO* spp.) in Washington. *Journal of Field Ornithology* 61:159-170.
- Bechard, M. J., and J. K. Schmutz. 1995. Ferruginous Hawk (*Buteo regalis*). *In* The Birds of North America, No. 172 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.
- Beck, T.D.I. 1977. Sage Grouse flock characteristics and habitat selection in winter. *J. Wildl. Manage.* 41:18-26.
- Beier, P. and J. E. Drennan. 1997. Forest structure and prey abundance in foraging areas of northern goshawks. *Ecol. Applications* 7: 564-571.
- Bilbrough, C.J. and J.H. Richards. 1993. Growth of sagebrush and bitterbrush following simulated winter browsing: mechanisms of tolerance. *Ecology* 74:481-492.
- Biosystems Analysis, Inc. 1989. Endangered Species Alert Program Manual: Species Accounts and Procedures. Southern California Edison Environmental Affairs Division.
- Braun, C.E. Britt, and R.O. Wallestad. 1977. Guidelines for maintenance of Sage Grouse habitats. *Wildl. Soc. Bull.* 5:99-106.
- Briske, D.D. and J.H. Richards. 1995. Plant Responses to Defoliation: A Physiological, Morphological and Demographic Evaluation. *In*: D.J. Bedunah and R.E. Sosebee (eds.) *Wildland Plants: Physiological Ecology and Developmental Morphology*. Soc. Range Management. Denver, CO
- Bureau of Land Management (BLM). 1983. Proposed Wells Resource Management Plan and Final Environmental Impact Statement. Elko, Nevada.
- _____. 1985. Wells Resource Management Plan Record of Decision. Elko, Nevada.
- _____. 1985. Programmatic Environmental Assessment of Integrated Weed Management on Bureau of Land Management Lands.
- _____. 1986. Proposed Resource Management Plan and Final Environmental Impact Statement, Elko Resource Area. Elko, Nevada.
- _____. 1987. Elko Resource Management Plan Record of Decision. Elko, Nevada.

- _____. 1988. National Environmental Policy Act Handbook – BLM Handbook H-1790-1. Washington, D.C.
- _____. 1991. Final Environmental Impact Statement – Vegetation Treatment on BLM Lands in Thirteen Western States.
- _____. 1995. Interim Management Policy and Guidelines for Lands Under Wilderness Review. Washington, D.C. H-8550-1, Rel. 8-67.
- _____. 2000a. Sheep Allotment Complex Evaluation. Elko, Nevada.
- _____. 2000b. Big Springs Allotment Evaluation. Elko, Nevada.
- _____. 2000c. Owyhee Allotment Evaluation. Elko, Nevada.
- _____. 2001a. Final Multiple Use Decision for the Sheep Allotment Complex. Elko, Nevada.
- _____. 2002a. Final Multiple Use Decision for the Big Springs Allotment. Elko, Nevada.
- _____. 2002b. Final Multiple Use Decision for the Owyhee Allotment. Elko, Nevada.
- _____. 2003. Approved Elko and Wells Resource Management Plans Fire Management Amendment. Elko, Nevada.
- Cade, T. J. 1982. The falcons of the world. Cornell University Press, Ithaca, NY.
- Connelly, J.W., and O.D. Markham. 1983. Movements and radionuclide concentrations of Sage Grouse in southeastern Idaho. *J. Wildl. Manage.* 47:169-177.
- Connelly, J.W., H.W. Browsers, and R.J. Gates. 1988. Seasonal movements of Sage Grouse in southeastern Idaho. *J. Wildl. Manage.* 55:521-524.
- Connelly, J.W., W.L. Wakkinen, A.D. Apa, and K.P. Reese. 1991. Sage grouse use of nest sites in southeastern Idaho. *J. Wildl. Manage.* 55: 521-524.
- Connelly, J.W., K.P. Reese, W.L. Wakkinen, M.D. Robertson, and R.A. Fischer. 1994. Sage Grouse ecology. Study I: Sage Grouse response to a controlled burn. Idaho Dep. Fish and Game, Boise. P-R Proj. W-160-R-21.
- Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. *Wildlife Society Bulletin* 28:967-985.
- Dietz, H.E. 1989. Grass: The stockman's crop. Sunshine Unlimited, Inc. Lindsborg, KS.
- Eng, R.L., and P. Schladweiler. 1972. Sage Grouse winter movements and habitat use in central Montana. *J. Wildl. Manage.* 36:141-146.
- Erlich, P. R., D. S. Dobkin and D. Wheye. 1988. The birder's handbook. Simon & Schuster, Inc., New York, NY.
- Evans, D. L. 1982. Status reports on twelve raptors. U.S. Department of the Interior, Fish and Wildlife Service, Special Scientific Report No. 238.
- Fischer, R.A. 1994. The effects of prescribed fire on the ecology of sage grouse in southeastern Idaho. Ph.D. Dissertation, University of Idaho, Moscow, ID.
- Fischer, R.A., K.P. Reese, and J.W. Connelly. 1996. Influence of vegetal moisture content and nest fate on timing of female Sage Grouse migration. *Condor* 98:868-872.
- Gill, R.B. 1965. Distribution and abundance of a population of Sage Grouse in North Park, Colorado. M.S. Thesis, Colorado State Univ., Fort Collins.
- Gilmer, D. S., and R. E. Stewart. 1984. Swainson's hawk nesting ecology in North Dakota. *Condor* 86:12-18.
- Green, G. A. and R. G. Anthony. 1989. Nesting success and habitat relationships of burrowing owls in the Columbia Basin, Oregon. *Condor* 91:347-354.

- Gregg, M.A. 1991. Habitat use and selection of nesting habitat by sage grouse in Oregon. M.S. Thesis, Oregon State Univ., Corvallis. 46pp.
- Gregg, M.A., J.A. Crawford, M.S. Drut, and A.K. DeLong. 1994. Vegetational cover and predation of sage grouse nests in Oregon. *J. Wildl. Manage.* 58:162-166.
- Gruell, G.E., L.E. Eddleman and R. Jandl. 1994. Fire history of the pinyon-juniper woodlands of Great Basin National Park. USDI, National Park Ser. Tech. Rep. NPS/PNROSU/NRTR-94/01.
- Harrison, R.D., N.J. Chatterton, B.L. Waldron, B.W. Davenport, A.J. Palazzo, W.H. Horton, and K.H. Asay. Forage Kochia Its Compatibility and Potential Aggressiveness on Intermountain Rangelands. Res. Rpt. 162. Utah Agri. Exp. Stat., Utah State University. Logan, UT.
- Holt, D. W. and S. M. Leasure. 1993. Short-eared Owl (*Asio flammeus*). *In* The Birds of North America, No. 62 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.
- Houston, C.S. 1995. Thirty-two consecutive years of reproductive success at a Ferruginous Hawk nest. *Journal of Raptor Research* 29:282-283.
- Howard, R.P., and M.L. Wolfe. 1976. Range improvement practices and Ferruginous Hawks. *Journal of Range Management* 29:33-37.
- Hupp, J.W., and C.E. Braun. 1989. Topographic distribution of Sage Grouse foraging in winter. *J. Wildl. Manage.* 53:823-829.
- Jewiss, O.R. 1972. Tillering in grasses – its significance and control. *J. Br. Grassland Society.* 27:65-82.
- Klebenow, D.A. 1969. Sage grouse nesting and brood habitat in Idaho. *J. Wildl. Manage.* 33:649-661.
- _____. 1982. Livestock grazing interactions with sage grouse. *Proc. Wildlife-Livestock Relationships Symp.*, Coeur d'Alene, Idaho. Univ. Idaho, Moscow. pp.113-123.
- _____. 1985. Habitat management for sage grouse in Nevada. *World Pheasant Assoc.* 10:36-46.
- Klebenow, D.A., and G.M. Gray. 1968. Food habits of juvenile sage grouse. *J. Range Manage.* 21:80-83.
- Kochert, M. N., K. Steenhof, C. L. McIntyre, and E. H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). *In* The Birds of North America, No. 684 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Leary, A.W., R. Mazaika, and M.J. Bechard. 1998. Factors affecting the size of Ferruginous Hawk home ranges. *Wilson Bulletin* 110:198-205.
- Marks, J. S., D. L. Evans, and D. W. Holt. 1994. Long-eared Owl (*Asio otus*). *In* The Birds of North America, No. 133 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.
- Martin, N.S. 1970. Sagebrush control related to habitat and Sage Grouse occurrence. *J. Wildl. Mange.* 34:313-320.
- Maser, C., J.W. Thomas, and R.G. Anderson. 1984. Wildlife habitats in managed rangelands—The Great Basin of southeastern Oregon. The relationship of terrestrial vertebrates to plant communities. USDA Forest Service Pacific Northwest Research Station and USDI Bureau of Land Management, General Technical Report PNW-172. La Grande, OR
- McAdoo, J.K., G.N. Back, M.R. Barrington, and D.A. Klebenow. 1986. Wildlife use of lowland meadows in the Great Basin. *Trans. N. Amer. Wildl. & Nat. Res. Conf.* 51:310-319.

- McCallum, D.A. 1994a. Review of technical knowledge: flammulated owls. Pages 14-46 *in* Flammulated, boreal and great grey owls in the United States: a technical conservation assessment. G. D. Hayward and J. Verner, editors. USDA For. Serv. Rocky Mtn. For. and Range Exp. Stn. Rocky Mtn. Gen. Tech. Rep. GTR-RM-253.
- McCallum, D.A. 1994b. Conservation status of flammulated owls in the United States. Pages 74-86 *in* Flammulated, boreal and great grey owls in the United States: a technical conservation assessment. G. D. Hayward and J. Verner, editors. USDA For. Serv. Rocky Mtn. For. and Range Exp. Stn. Rocky Mtn. Gen. Tech. Rep. GTR-RM-253.
- McCallum, D. A. 1994c. Flammulated Owl (*Otus flammeolus*). *In* The Birds of North America, No. 93 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.
- Miller F.M. and L. L. Eddleman. 2000. Spatial and Temporal Changes of Sage Grouse Habitat in the Sagebrush Biome. Tech. Bulletin 151. Oregon State University, Corvallis.
- Miller, R.F., and J.A. Rose. 1999. Fire history and western juniper encroachment in sagebrush steppe. *J. Range Manage.* 52: 550-559.
- NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life. Version 4.5. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>
- Neel, L. 1980. Sage grouse response to grazing management in Nevada. M.S. Thesis, Univ. Nevada-Reno.
- Nevada Department of Wildlife (NDOW). 2004. Sage Grouse Conservation Plan for Nevada and Portions of Eastern California. Reno, Nevada.
- _____. 2005. Nevada Comprehensive Wildlife Conservation Strategy. Reno, NV.
- Nevada Division of Wildlife (NDOW). 2000. Nevada Sage Grouse Conservation Strategy L. Neel (ed.). Reno, Nevada.
- Nevada Natural Heritage Program. 2005. Detailed rare animal list. <http://heritage.nv.gov/animlsm1.htm>
- Nevada Partners in Flight. 1999. Bird Conservation Plan. Nevada Partners in Flight. L. Neel (ed.). Reno, NV. <http://www.blm.gov/wildlife/plan/pl-nv-10.pdf>
- Niemuth, N. 1992. Use of man-made structures by nesting Ferruginous Hawks in Wyoming. *Prairie Naturalist* 24:43.
- Norton, B.E. and P.S. Johnson. 1983. Pattern of defoliation by cattle grazing crested wheatgrass pastures. p. 462-464. *In*: J.A. Smith and V.W. Hayes (eds.) Proc. XIV Int. Grassland Congress. Westview Press, Boulder, CO.
- Oakleaf, R.J. 1971. Relationship of Sage Grouse to upland meadows in Nevada. M.S. thesis, Univ. of Nevada, Reno.
- Palmer, R. S. 1988. Handbook of North American birds. Vol. 4. Diurnal raptors (part 1). Yale Univ. Press, New Haven, CT.
- Patterson, R.L. 1952. The Sage Grouse in Wyoming. Sage Books, Inc., Denver, CO.
- Perkins, M.A. and W.A. Lindsey. 1983. Nesting studies of ferruginous hawks in the Ely BLM District, Nevada. *North American Bird Bander* 8(3):106-108.
- Reynolds, R. T., B. D. Linkhart. 1992. Flammulated Owls in ponderosa pine: Evidence of preference for old growth. Pp. 166–169 *in* Old-growth forests in the Southwest and Rocky Mountain regions: Proceedings of a workshop (M. R. Kaufmann, W. H. Moir, and R. L. Bassett, tech. coords.). U.S. For. Serv. Gen. Tech. Rep. RM–213.
- Rich, T. 1999. Trends in Selected Livestock Management Actions on BLM Lands in

- Sage Grouse States. 14 June, 1999. Unpublished summary of BLM actions based on data available in: *Public Land Statistics*. 1997, Vol. 182.
- Richards, J.H. and M.M. Caldwell. 1985. Soluble carbohydrates, concurrent photosynthesis and efficiency in regrowth following defoliation: A field study with *Agropyron* species. *J. Appl. Ecol.* 22:907-920.
- Robertson, M.D. 1991. Winter ecology of migratory Sage Grouse and associated effects of prescribed fire in southeastern Idaho. M.S. Thesis, Univ. Idaho, Moscow.
- Savage, D.E. 1968. The relationship of Sage Grouse to upland meadows in Nevada. M.S. thesis, Univ. Of Nevada, Reno.
- Schlatterer, E.F., and D.B. Pyrah. 1970. Ecological effects of chemical and mechanical sagebrush control. Montana Fish and Game Dept., Fed. Aid Wildl. Rest. Proj. W-105-R-4. Job Compl. Rept. 121 pp.
- Schmalzried, J. T. 1976. Nesting and food habits of the Golden Eagle on the Laramie Plains. Master's thesis, Univ. of Wyoming, Laramie.
- Schroeder, M.A., J.R. Young, and C.E. Braun. 1999. Sage Grouse (*Centrocercus urophasianus*). In: *The Birds of North America* No. 425, (A. Poole and F. Gill, eds.), The Birds of North America, Inc., Philadelphia, PA.
- Schmutz, J.K. 1987. The effect of agriculture on Ferruginous and Swainson's hawks. *Journal of Range Management* 40:438-440.
- Schmutz, J. K., and R. W. Fyfe. 1987. Migration and mortality of Alberta ferruginous hawks. *Condor* 89:169-174.
- Scott, J.W. 1942. Mating behaviour of the Sage Grouse. *Auk* 59: 477-498.
- Seibert, D. J., R. J. Oakleaf, J. M. Laughlin, J. L. Page. 1976. Nesting ecology of Golden Eagles in Elko County, Nevada, Tech. Note 281. U.S. Dep. Int., Bur. Land Manage., Denver, CO.
- Sherrod, S. K. 1983. Behavior of fledgling peregrines. Pioneer Impressions, Fort Collins, CO (available from The Peregrine Fund, Inc., Ithaca, NY.)
- Smith, D.G., and J.R. Murphy. 1978. Biology of the Ferruginous Hawk in central Utah. *Sociobiology* 3:79-98.
- Squires, J. R., and R. T. Reynolds. 1997. Northern Goshawk (*Accipiter gentilis*). In *The Birds of North America*, No. 298 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.
- Sveum, C.M., W.D. Edge, and J.A. Crawford. 1998a. Nesting habitat selection by Sage Grouse in south-central Washington. *J. Range Manage.* 51:265-269.
- Sveum, C.M., J.A. Crawford, and W.D. Edge. 1998b. Use and selection of brood-rearing habitat by Sage Grouse in south central Washington. *Great Basin Nat.* 58: 344-351.
- Terres, J. K. 1980. *The Audubon Society encyclopedia of North American birds*. Alfred A. Knopf, New York.
- Wakeley, J.S. 1978. Factors affecting the use of hunting sites by Ferruginous Hawks. *Condor*: 80:316-326.
- Wallestad, R.O. 1971. Summer movements and habitat use by Sage Grouse broods in central Montana. *J. Wildl. Manage.* 35:129-136.
- _____. 1975. Life history and habitat requirements of Sage Grouse in central Montana. Montana Dep. Fish, Game, and Parks, Helena.
- Wallestad, R.O, J.G. Peterson, and R.L. Eng. 1975. Foods of adult Sage Grouse in central Montana. *J. Wildl. Manage.* 39:628-630.
- Ward, J. P., L. R. Hanebury, R. L. Phillips. 1983. Raptor inventory of coal areas in western North Dakota. Rep. prepared for U.S. Fish

- Wildl. Serv., Bismarck Field Office, Bismarck, ND.
- Widén, P. 1989. The hunting habitats of goshawks *Accipiter gentilis* in boreal forests of central Sweden. *Ibis* 131: 205-231.
- Wijnandts, H. 1984. Ecological energetics of the Long-eared Owl (*Asio otus*). *Ardea* 72: 1–92.
- Wiley, R.H., Jr. 1978. The lek mating system of the Sage Grouse. *Sci. Am.* 238(5): 114-125.
- Whisenant, S.G. 1990. Changing fire frequencies on Idaho's Snake River Plains: ecological management implications. Pages 4-10 *in* E.D. McArthur, E.M. Romney, and P.T. Tueller, editors, Proceedings of the symposium on cheatgrass invasion, shrub die-off, and other aspects of shrub biology and management, Las Vegas, NV, April 5-7, 1989. USDA Forest Service General Technical Report INT-276. Intermountain Research Station, Ogden, UT.
- White, C. M., N. J. Clum, T. J. Cade and W. G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). *In* A. Poole and F. Gill, (eds.). The Birds of North America, No. 660. The Birds of North America, Inc., Philadelphia, PA.
- Young, J.A., R.E. Eckert, Jr., and R.A. Evans. 1979. Historical Perspectives Regarding The Sagebrush Ecosystem. Univ. Nevada, Renewable Resources center, Reno, NV.
- Young, J.A. and R.A. Evans. 1981. Demography and fire history of a western juniper stand. *J. Range Manage.* 34: 501-506.
- Younk, J. V. and J. Bechard. 1994. Breeding ecology of the northern goshawk in high-elevation aspen forest of northern Nevada. *Stud. Avian Biol.* 16: 119-121.

7.0 GLOSSARY AND LIST OF ACRONYMS

7.1 Glossary

Areas of Critical Environmental Concern – areas within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. The identification of a potential ACEC shall not, of itself, change or prevent change of the management or use of public lands.

Appropriate Management Level – the number of wild horses that can be sustained within a designated HMA which achieves and maintains a thriving natural ecological balance, keeping with the multiple-use management concept for the area. The AML for an HMA is based on in-depth analysis and monitoring data and established through a decision process.

Allotment Management Plan – A management plan for grazing a specific allotment, based on allotment-specific goals and objectives, consistent with the Land Use Plan and Standards for Rangeland Health. The plan includes consideration of wildlife, wild horses, and other resources, as appropriate.

Animal Unit Month – the amount of forage necessary for the sustenance of on cow/calf pair

or its equivalent (i.e., five sheep) for a period of one month.

Carrying Capacity – an estimate of the number of AUMs available within a pasture or allotment.

Herd Area and Herd Management Area – Herd Areas are areas of public lands identified as being habitat used by wild horses at the time of the passage of the Wild Free-Roaming Horse and Burro Act of 1971, as amended. Herd Management Areas are subsets of the Herd Areas and are designated only on areas of public lands within Herd Areas where long-term management of wild horses can be sustained.

Land Use Plan or Resource Management Plan – a management plan for an area (generally a BLM District or portion thereof) that has been developed through public input and involvement. The land use plan provides management direction for the various resources and programs which the BLM oversees. Management actions carried out by the BLM must be in conformance with the Land Use Plan, or the Land Use Plan may be amended, through a public process, to accommodate the proposed action.

Multiple Use Decisions – is a decision to implement a management plan to meet the multiple use objectives for grazing allotment(s), consistent with the applicable Land Use Plan and plan amendments, Standards and Guidelines for Rangeland Health, and other applicable management direction. The Multiple Use Decision is based on an evaluation of monitoring data specific to the allotment to which the decision applies and involves public input with respect to the management options.

7.2 List of Acronyms

ACEC	Area of Critical Environmental Concern
AML	Appropriate Management Level
AMP	Allotment Management Plan
AUM	Animal Unit Month
BLM	Bureau of Land Management
BSR	Big Springs Ranch
CC	Carrying Capacity
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
EFO	Elko Field Office
EIS	Environmental Impact Statement
FFR	Fenced Federal Range
FLPMA	Federal Land Policy and Management Act
FRH	Fundamentals of Rangeland Health
HMA	Herd Management Area
HSU	Historic Suspended Use
LUP	Land Use Plan
MBTA	Migratory Bird Treaty Act
MUD	Multiple Use Decisions
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NRS	Nevada Revised Statutes
OHV	Off Highway Vehicle
PCS	Potential Contamination Sources
RAC	Resource Advisory Council
RMP	Resource Management Plans
ROD	Record of Decision
RPS	Rangeland Program Summary
SOP	Standard Operating Procedure
State Team	State Sage grouse Conservation Team
USFWS	U.S. Fish and Wildlife Service
VNU	Voluntary Non-Use
WAFWA	Western Association of Fish and Wildlife Agencies
WSA	Wilderness Study Area

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APPENDIX A
MAPS

APPENDIX B
MANAGEMENT FRAMEWORK

Management Framework - Vegetation

Public lands under BLM administration are managed for multiple use under the guidance of the Elko and Wells RMPs. In addition, the Northeastern Great Basin RAC developed *Standards and Guidelines for Rangeland Health* for the area, and these standards are guidelines to provide direction for BLM management. The individual AMPs also include allotment-specific objectives for management of the allotments.

The Carson-Foley Act of 1968 directs the BLM to take any action necessary “to prevent unnecessary and/or undue degradation of the public lands.” The Noxious Weed Act of 1974, as amended by Section 15 of the Management of Undesirable Plants on Federal Lands (1990), authorizes the Secretary of Interior to “cooperate with other federal and state agencies and others in carrying out operations or measures to eradicate, suppress, control, prevent, or retard the spread of any noxious weed.” The provisions of the act direct the agencies to consider noxious weeds when considering impacts of surface disturbing activities. Executive Order 13112: Invasive Species (1999) requires each federal agency whose actions may affect the status of invasive species to identify such actions and implement measures to prevent the introduction of invasive species as well as detect and respond rapidly to control populations of invasive species. U.S. Department of Interior Manual 609 sets forth policy to control undesirable or noxious weeds on the lands, waters, or facilities under its jurisdiction, to the extent economically practicable, and as needed for resource protections and accomplishment of resource management objectives.

Management Framework – Wetlands/Riparian Zones

Public lands under BLM administration are managed for multiple use under the guidance of the Elko and Wells RMPs. In addition, the Northeastern Great Basin RAC developed *Standards and Guidelines for Rangeland Health*

for wetland and riparian areas, and these standards are guidelines to provide direction for BLM management. The individual AMPs also include allotment-specific objectives for wetland/riparian area management.

Executive Order 11990: Protection of Wetlands is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funding to state or local projects. Under this order, federal agencies are to use measures of avoidance, mitigation, or preservation with public input before proposing new construction in wetlands. The BLM Riparian-Wetland Initiative for the 1990s provides a national strategy for management and restoration of riparian/wetland areas on BLM-administered lands.

Management Framework – BLM Sensitive Species

The sensitive species designation is normally used for species that occur on BLM-administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. Species listed or proposed for listing under the Endangered Species Act are not included in BLM’s listing of sensitive species. BLM Sensitive Species are those species: 1) that are currently under status review by the U.S. Fish and Wildlife Service, 2) whose numbers are declining so rapidly that Federal listing may become necessary; 3) with typically small and widely dispersed populations; 4) that inhabit ecological refugia or other specialized or unique habitats; or 5) are included as State of Nevada Listed Species (under the authority of Nevada Administrative Codes 501.100 - 503.104), but which may be better conserved through application of BLM sensitive species status. Nevada BLM policy is to provide State of Nevada Listed Species and Nevada BLM Sensitive Species with the same level of protection as is provided for Federally listed candidate species and their habitats to ensure that actions authorized, funded, or carried out by

the BLM do not contribute to the need for the species to become listed as threatened or endangered under the Endangered Species Act.

The Bald Eagle Protection Act (PL 92-535), through provisions and amendments, provides federal protection to the golden eagle. This act prohibits the direct or indirect taking of an eagle, eagle part or product, or eagle nest.

The Migratory Bird Treaty Act of 1918, as amended, prohibits the taking of any migratory birds without a permit. An action that contributes to unnatural migratory bird mortality could be considered a violation of this act. Many of the raptor species are migratory species, and therefore, are afforded protection under this act.

The Executive Order (EO) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (66 FR 3853), of January 17, 2001, directs Federal agencies to take certain actions to conserve migratory birds in furtherance of the United States' obligations under the migratory bird conventions and the Migratory Bird Treaty Act. EO 13186 directed that within two years the Bureau of Land Management, U.S. Forest Service, and U.S. Fish and Wildlife Service must develop and implement a Memorandum of Understanding (MOU) for the conservation of migratory bird populations.

The State of Nevada has developed the *Nevada and Eastern California Sage-Grouse Conservation Plan* (NDOW 2004) to guide the conservation of sage grouse in Nevada. In addition, WAFWA has developed range wide guidelines to manage sage grouse populations and their habitats (Connelly et al. 2000). BLM Nevada has also developed specific guidelines that were finalized October 2000 to direct management activities in the State in relation to sage grouse habitat requirements.

Nevada Revised Statutes (NRS 501.181) authorizes NDOW and the Wildlife Commission with the protection, propagation, restoration,

transplanting, introduction, and management of wildlife in the state.

Management Framework – Non-Native, Invasive Species

Public lands under BLM administration are managed for multiple use under the guidance of the Wells RMP. In addition, the Northeastern Great Basin RAC developed *Standards and Guidelines for Rangeland Health* for the area, and these standards are guidelines to provide direction for BLM management. The individual AMP also includes allotment-specific objectives for management of the allotments.

The Carson-Foley Act of 1968 directs the BLM to take any action necessary “to prevent unnecessary and/or undue degradation of the public lands.” The Noxious Weed Act of 1974, as amended by Section 15 of the Management of Undesirable Plants on Federal Lands (1990), authorizes the Secretary of Interior to “cooperate with other federal and state agencies and others in carrying out operations or measures to eradicate, suppress, control, prevent, or retard the spread of any noxious weed.” The provisions of the act direct the agencies to consider noxious weeds when considering impacts of surface disturbing activities. Executive Order 13112: Invasive Species (1999) requires each federal agency whose actions may affect the status of invasive species to identify such actions and implement measures to prevent the introduction of invasive species as well as detect and respond rapidly to control populations of invasive species. U.S. Department of Interior Manual 609 sets forth policy to control undesirable or noxious weeds on the lands, waters, or facilities under its jurisdiction, to the extent economically practicable, and as needed for resource protections and accomplishment of resource management objectives.

Management Framework – Cultural Resources

Compliance with the National Historic Preservation Act (NHPA) is guided by the State Protocol Agreement between the Nevada BLM and the State Historic Preservation Office (SHPO). Decisions concerning inventory requirements and specific procedures to be followed both during and following inventories, including the production of reports, determinations of site eligibility, determinations of project effects to historic properties, and consultation with the State Historic Preservation Officer are detailed in the Protocol Agreement, as well as in BLM manual 8100 and the BLM's "Cultural Resources Inventory General Guidelines", 4th edition. The Elko Field Office strictly adheres to these documents as standard operating procedures in order to comply with Section 106 of the NHPA.

In general, inventory requirements are made on a case-by-case basis when earth-disturbing activities are proposed at specific locations. The need for new inventories are based on a number of factors, including, but not limited to, the amount of previous inventories conducted in the general vicinity of proposed projects, the results of prior inventories, and the probability that significant cultural resources will be present based on pre-field archival research and locations of proposed projects on the landscape. Inventories are generally not conducted during the issuance of general grazing permits; rather, they are completed during site specific project proposals. The reasons that inventories are generally not completed at the grazing permit level are twofold:

1. only about five percent of the approximately seven million acres of land within the jurisdiction of the Elko Field Office has been previously inventoried for cultural resources; therefore, it is not feasible to conduct large-scale inventories of entire allotments, which

themselves generally consist of tens of thousands of acres; and,

2. most importantly, it is often not practicable to determine the precise agent(s) of impacts to cultural resources that may occur on a general scale on a day-to-day basis.

On any given day, impacts to cultural resources may occur as a result of off-road vehicle use, illegal artifact collecting, grazing (by pronghorn, deer, cattle, and wild horses), and natural erosive forces such as sheetwash rain, wind, snowmelt etc. These impacts generally cannot be separated and singled out as a primary impact to cultural resources on a site specific basis. Additionally, regarding cattle grazing, it is well known that the number and intensity of grazing animals was far greater in the late nineteenth and early twentieth centuries (generally before passage of the Taylor Grazing Act in the 1930's) than the intensity of grazing which occurs today. As a result, impacts to cultural resources generally have lessened over the course of the past 50+ years compared to earlier impacts. It is not feasible to quantify and compare current impacts in order to make judgments regarding the degree of impacts that may go beyond those already inflicted during days of unregulated grazing. Thus, the focus of inventory efforts is placed on site specific project designs in which both the agent of impact and the location of impact are "knowable."

If an inventory is required, archaeological sites are recorded (described), eligibility determinations are made (either by the BLM alone or by the BLM in consultation with the SHPO's office, as specified by the Protocol Agreement), and determinations of project effects to sites eligible for the National Register are made, again either by the BLM alone or by the BLM in consultation with the SHPO's office as specified by the Protocol Agreement. As a general rule, projects are redesigned to avoid eligible sites, which results in a "no effect" or "no adverse effect" determination. If eligible sites cannot be avoided,

then mitigation measures are implemented that take into account the impending impact, such as archaeological excavation, additional archival research, and the like. These mitigation measures are implemented in consultation with the SHPO's office, and ultimately result in a "no adverse effect" determination following their implementation.

Management Framework - Native American Religious Concerns

In accordance with the National Historic Preservation Act (P.L. 89-665), the National Environmental Policy Act (P.L. 91-190), the Federal Land Policy and Management Act (P.L. 94-579), the American Indian Religious Freedom Act (P.L. 95-341), the Native American Graves Protection and Repatriation Act (P.L. 101-601) and Executive Order 13007, the BLM must provide affected tribes an opportunity to comment and consult on proposed actions that may have impacts to tribal resources, activities, or interests. BLM must attempt to limit, reduce, or possibly eliminate any negative impacts to identified Native American traditional/cultural/spiritual sites, activities, and resources.

Also, in accordance with Federal legislation and executive orders, Federal agencies must consider the impacts their actions may have to Native American traditions and religious practices. Consequently, the BLM must take steps to identify locations having traditional/cultural or religious values to Native Americans and insure that its actions do not unduly or unnecessarily burden the pursuit of traditional religion or traditional lifeways.

Standard Operating Procedures Common to All Projects

General

The following Standard Operating Procedures (SOPs) apply to all projects:

1. If any cultural properties, items or artifacts (stone tools, projectile points, etc.) are encountered during the construction of the project, they should not be collected and BLM archaeologists should be notified. Cultural and Archaeological resources are protected under the Archaeological Resources Protection Act (16 U.S.C. 470ii) and the Federal Land Management Policy Act (43 U.S.C. 1701). Also, though the possibility of disturbing Native American gravesites within the project area is extremely low, inadvertent discovery procedures must be noted. Under the Native American Graves Protection and Repatriation Act, section (3)(d)(1), it states that the discovering individual must notify the land manager in writing of such a discovery. If the discovery occurs in connection with an authorized use, the activity, which caused the discovery, is to cease and the materials are to be protected until the land manager can respond to the situation
2. All trash and excess debris will be removed from the public lands and disposed of at an approved solid waste disposal site within 10 days of construction completion.
3. Ensure that vehicles entering and exiting project site are clean of any noxious weed plant parts and that they stay on existing and established roads to the site.
4. Baseline surveys will be conducted for special status species (plant and animal) prior to project implementation. Projects will be designed to avoid special status species and monitoring will be conducted to determine if indirect activities associated with projects are causing impacts.
5. A raptor and migratory bird nesting survey will be required for projects that

are proposed to be constructed between March-July.

6. All equipment oil and hydraulic leaks will be repaired before use. Any leaks developed during use will be repaired immediately. If leaks into the soil are possible, drip pans will be used to prevent soil contamination.
7. During fueling operations the operator will insure no fuel spillage occurs. Care should be taken to insure all fuel tank caps, hoses, and spillage is minimized to prevent soil contamination. Should a spill occur, it should be reported to the Center Hazardous Materials Specialist immediately for proper action.
8. All soil disturbances will be monitored for the establishment of noxious weeds. Steps will be taken to treat any new infestations that result from construction activities.
9. Disturbed areas will be treated, where such action is necessary and practical, to replace ground cover and prevent erosion.
10. No project construction will occur within the source water protection zone located above the springs that are a municipal water source for West Wendover.
11. BLM will obtain all necessary permits prior to construction to comply with state and federal laws.
12. Avoid surface disturbing activities when soils are wet on soils that are most susceptible to compaction (sandy loam, loam, and sandy clay loam textures).

Fence Projects

Construction and maintenance of the fences will be subject to the following Special Project Requirements:

1. Fences will be built in accordance with manual H-1741-1. Modifications may be incorporated into the design based on consultation with NDOW and subsequent recommendations to mitigate impacts to big game. Let down fences will be constructed in big game crucial ranges and migration corridors where feasible and necessary.
2. Increase the visibility of fences constructed within 1 km of seasonal sage grouse ranges by utilizing appropriate measures such as installing deflectors, flagging, wider fence stays, white-topped posts, etc.
3. All corners and stress panels will be constructed with steel pipe to BLM specifications. (This would reduce any reconstruction costs versus the use of wood posts due their ability to withstand the effects of wildfire). Domed pipe caps would be secured to top of steel pipes to prevent wildlife entry and minimize predatory bird perching. The top fence wire would be secured above horizontal steel pipe braces to minimize perching by predatory birds.
4. For access during construction, minimal blading, grading, or scaling of the fence line will be allowed. Surface disturbance associated with project construction will not exceed a 20-foot corridor along the route of the fenceline. Brush removal, if necessary, would be done by hand or with "brush beater" type equipment that does not uproot brush or otherwise break the ground surface. After the fence is constructed, the BLM would evaluate the need for reseeding disturbed areas to prevent the spread of undesired weed species.
5. The East Squaw Creek Riparian fence will be designed with a minimum 200 ft. setback (excluding water gap locations)

to minimize impacts to big game and avian species.

6. Fences will be maintained on an annual basis by the permittee. If fences are not maintained satisfactorily, action may be taken against the permit.

Water Projects

Construction and maintenance of the pipeline system and well development will be subject to the following requirements:

1. All phases of construction for the well development and pipeline will meet BLM specifications.
2. Stockwater troughs will be located to take advantage of topography and vegetation to screen sites from view. Stockwater troughs shall be placed so that the height of the top rim shall not exceed 20 inches above ground level and maintained at this level or lower level. The overflow outlets will be located downhill from the trough a minimum of 40 feet.
3. A bird and small mammal access ramp/escape ladder (furnished and installed by the BLM or designed as part of the stockwater trough itself) will be maintained in each stockwater trough by the permittee.
4. Stockwater troughs and the storage tank will be painted an earthtone color (approved by the BLM) which blends with the surrounding environment.
5. No roads will be constructed, but vehicular use along the pipeline route would occur with routine maintenance.
6. If concentrated runoff occurs along vehicle tracks which begin to cause rilling or gullying, water breaks would be installed every 200 feet where slopes are

less than ten percent, and every 150 feet on 11-25 percent slopes.

7. Surface disturbance associated with the project construction will not exceed a width of a 30-foot corridor along the route of the pipeline and a 30-foot diameter circle around each trough. All ground disturbance associated with pipeline construction resulting in bare ground will be seeded with a seed mixture approved by BLM to help prevent soil erosion and noxious weed/annual exotic weed establishment.
 8. Pipe will be buried at least 18 inches below the ground surface unless otherwise required for engineering or mitigation of cultural resource values.
 9. No blading, grading, or scalping of the pipeline route will be allowed. Brush removal, if necessary, will be done by hand or with "brush beater" type equipment which does not uproot brush or otherwise break the ground surface.
 10. The permittee will ensure that troughs are left full to provide water for wildlife when livestock are removed from the area as required by NRS 533.367. It will be requested that water be available in the troughs from April 15 through October 15 of each year regardless of the given year's grazing system as some wildlife species may become dependent on the troughs as water sources. The water shall be drained if freezing weather necessitates earlier drainage to prevent damage to the pipelines and troughs.
 11. A well site investigation which considers water availability, quality, and potential impacts to surface waters or other groundwater users, will be performed by an employee that is trained to perform this type of work (typically hydrologist, geologist, or engineer) prior to drilling any
-

wells. New wells will be sited where there would be minimal or no impact to surface water nor to other groundwater users.

12. BLM will comply with current water rights policy prior to developing waters.
13. Troughs will be located on soils that are resistant to compaction (gravelly soils) whenever possible.

APPENDIX C

ALLOTMENT-SPECIFIC OBJECTIVES

**SHORT-TERM AND LONG-TERM OBJECTIVES FOR THE
SHEEP ALLOTMENT COMPLEX, BIG SPRINGS EAST AND
WEST ALLOTMENTS, AND OWYHEE ALLOTMENT**

SHEEP ALLOTMENT COMPLEX

A. STANDARDS AND GUIDELINES FOR RANGELAND HEALTH

Standard 1. Upland Sites: Upland Soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and land form.

Standard 2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

Standard 3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

Standard 4. Cultural Resources: Land use plans will recognize cultural resources within the context of multiple use.

B. LAND USE PLAN (WELLS RMP/ROD) OBJECTIVES

1. Livestock Grazing

- a. Public rangelands are managed to: enhance the productivity of the rangelands by preventing overgrazing and soil deterioration; stabilize the livestock industry dependent on public range; provide for inventory and categorization based on conditions and trends; and provide for orderly use, improvement and development.
- b. To provide for livestock grazing consistent with other resource uses...

Attainment or non-attainment of the general objectives above is based on the conclusions for the more specific Allotment/Rangeland Program Summary and Key Area Objectives listed below.

2. Wild Horses (As Applicable to the Big Springs Allotment)

- a. Manage wild horses outside of checkerboard areas where land ownership patterns are not a problem for management.
- b. Manage wild horses within HMAs and maintain a thriving natural ecological balance consistent with other resource needs.

Specific objectives for wild horse management in the Big Springs Allotment have been developed based on the objectives above. These objectives are included under the Allotment Specific Objectives below.

3. Terrestrial Wildlife habitat

- a. Conserve and enhance wildlife habitat to the maximum extent possible.
-

b. Eliminate all of the fencing hazards in crucial big game habitat and most of the fencing hazards in noncrucial big game habitat.

c. Eliminate all of the high and medium priority terrestrial riparian habitat conflicts in coordination with other resource uses.

Attainment or non-attainment of the general objectives above is based on the conclusions under the Standards and Guidelines for Rangeland Health, and Allotment Specific Objectives below.

d. Manage public lands in the Wells Resource Area on a sustained yield basis to support elk populations at a level consistent with other resource needs, while minimizing impacts to adjacent private and public land resources. Manage elk habitat in good or better condition within six management areas within the resource area to provide forage to sustain a total resource area target population level of 1,980 - 2,420.

The Big Springs Allotment falls within three larger elk management areas. The portion of the allotment north of Interstate 80 and west of the highway to Montello, Nevada falls within the Goose Creek Management Area. The portion of the allotment south of Interstate 80 falls within the Spruce/Pequop Management Area. The portion of the allotment north of Interstate 80 and east of the highway to Montello, Nevada falls within the Pilot Mountain Management Area.

4. Riparian/Stream Habitat

Note: This RMP objective was directed at improving riparian/stream habitat for fish and thus improve riparian habitat for other resources. However, there is only one stream in this allotment (East Squaw Creek) and it is not classified as nor supports a fishery. Therefore, riparian habitat objectives in this allotment are addressed through the Standards and Guidelines for Rangeland Health, and multiple use objectives for terrestrial riparian habitat.

C. SHEEP ALLOTMENT COMPLEX SPECIFIC OBJECTIVES

a. Short Term Objectives:

1. Maximum combined utilization by both livestock and wild horses will not exceed 50% of current year's growth on key herbaceous species for those pastures within the HMA.
 2. Maximum utilization of 50% of current years growth on key herbaceous species by the end of the grazing season within both the Lower and Upper 4-mile Pastures.
 3. Maximum utilization of 60% of current year's growth on crested wheatgrass within the Winters Creek Seeding Pasture by the end of the grazing season.
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BIG SPRINGS ALLOTMENT

A. STANDARDS AND GUIDELINES FOR RANGELAND HEALTH

Standard 1. Upland Sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and land form.

Standard 2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

Standard 3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

Standard 4. Cultural Resources: Land use plans will recognize cultural resources within the context of multiple use.

WELL RESOURCE MANAGEMENT PLAN OBJECTIVES, AS AMENDED:

1. Livestock Grazing

a. Public rangelands are managed to: enhance the productivity of the rangelands by preventing overgrazing and soil deterioration; stabilize the livestock industry dependent on public range; provide for inventory and categorization based on conditions and trends; and provide for orderly use, improvement and development.

b. To provide for livestock grazing consistent with other resource uses...

Attainment or non-attainment of the general objectives above is based on the conclusions for the more specific Allotment/Rangeland Program Summary and Key Area Objectives listed below.

2. Wild Horses (As Applicable to the Big Springs Allotment)

a. Manage wild horses outside of checkerboard areas where land ownership patterns are not a problem for management.

b. Manage wild horses within HMAs and maintain a thriving natural ecological balance consistent with other resource needs.

Specific objectives for wild horse management in the Big Springs Allotment have been developed based on the objectives above. These objectives are included under the Allotment Specific Objectives below.

3. Terrestrial Wildlife habitat

- a. Conserve and enhance wildlife habitat to the maximum extent possible.
- b. Eliminate all of the fencing hazards in crucial big game habitat and most of the fencing hazards in noncrucial big game habitat.
- c. Eliminate all of the high and medium priority terrestrial riparian habitat conflicts in coordination with other resource uses.

Attainment or non-attainment of the general objectives above is based on the conclusions under the Standards and Guidelines for Rangeland Health, and Allotment Specific Objectives below.

- d. Manage public lands in the Wells Resource Area on a sustained yield basis to support elk populations at a level consistent with other resource needs, while minimizing impacts to adjacent private and public land resources. Manage elk habitat in good or better condition within six management areas within the resource area to provide forage to sustain a total resource area target population level of 1,980 - 2,420.

The Big Springs Allotment falls within three larger elk management areas. The portion of the allotment north of Interstate 80 and west of the highway to Montello, Nevada falls within the Goose Creek Management Area. The portion of the allotment south of Interstate 80 falls within the Spruce/Pequop Management Area. The portion of the allotment north of Interstate 80 and east of the highway to Montello, Nevada falls within the Pilot Mountain Management Area.

4. Riparian/Stream Habitat

Note: This RMP objective was directed at improving riparian/stream habitat for fish and thus improve riparian habitat for other resources. However, there is only one stream in this allotment (East Squaw Creek) and it is not classified as nor supports a fishery. Therefore, riparian habitat objectives in this allotment are addressed through the Standards and Guidelines for Rangeland Health, and multiple use objectives for terrestrial riparian habitat.

C. ALLOTMENT SPECIFIC OBJECTIVES INCLUDING RANGELAND PROGRAM SUMMARY (RPS) OBJECTIVES:

1. "Improve livestock distribution in the following pastures: Independence Valley, North Pequop Mountain, Collar and Elbow, Shafter, East Squaw Creek, East Pequop Bench, and Six-Mile Canyon."
 2. "Improve or maintain all seasonal big game habitat in the Big Springs Allotment to good or excellent condition to provide forage and habitat capable of supporting the following reasonable numbers by 2005: 4,834 mule deer - 6,211 AUMs; 76 antelope - 182 AUMs; 22 bighorn sheep - 53 AUMs."
 3. "Facilitate big game movements by modifying existing fences to Bureau standards where necessary (17 miles)."
 4. "Improve, enhance, or develop 5 springs in the Big Springs Allotment to good or excellent condition."
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5. "Improve crucial deer winter habitat by: cutting (thinning) within 17,000 acres of the pinyon/juniper forest type; chaining or burning and seeding 2,500 acres of sagebrush."

6. "Reintroduce bighorn sheep into the Goshute Mountains."

7. "Elk - (a.) Manage elk habitat in good or better condition within the Goose Creek Management Area to support a target elk population level of 1,070 plus or minus 10 percent. (Note: Some of the elk are expected to utilize habitat in the Big Springs Allotment.)

(b.) Manage elk habitat in good or better condition within the Spruce/Pequop Management Area to support a target elk population level of 340 plus or minus 10 percent. (Note: Some of the elk are expected to utilize habitat in the Big Springs Allotment.)

(c.) Manage elk habitat in good or better condition within the Pilot Mountain Management Area to support a target elk population level of 250 plus or minus 10 percent. (Note: Some of the elk are expected to utilize habitat in the Big Springs Allotment.)"

8. "Manage for a wild horse herd size which will maintain a thriving ecological balance consistent with other multiple uses while remaining within the wild horse herd management area."

9. Remove sufficient wild horses to attain the initial herd size and maintain populations at a level which will maintain a thriving natural ecological balance consistent with other resource values.

D. KEY AREA OBJECTIVES:

1. Short Term Objectives:

The short term objectives are utilization objectives.

The utilization objective for native key forage grasses is as follows:

- 50% average use; not to exceed 55% in any single year.

The utilization objective for introduced seeded grasses is as follows:

- 65% average use; not to exceed 70% in any single year.

The utilization objective for native half-shrubs such as white sage and saltbush is as follows:

- 55% average use; not to exceed 60% in any single year.

The utilization objective for bitterbrush is as follows:

- 25% average use by livestock at the end of the summer use period;
- 45% average use by wildlife and livestock combined at end of winter.

The utilization objective applicable to wild horses is as follows:

- 10% average use by wild horses prior to entry by livestock on winter range;
- 55% average use by wild horses and livestock combined at end of winter.

2. Long Term Objectives:

The specific long term objectives for each key area have been listed below.

4306-01 *"Maintain or improve the ecological condition at or above 48% of the potential natural community."*

"Maintain or increase the percent frequency of Indian ricegrass and the needlegrass species."

4306-02 *Retain the utilization objective.*

4306-03 *Establish new key areas for the Holborn Pasture.*

4306-04 *Establish new key areas for the Holborn Pasture.*

4306-06 *Establish new key areas for the Holborn Pasture.*

4306-05 *"Maintain the ecological condition as measured in 1987 at 66% of PNC by 1996."*

"Maintain or increase the frequency of Thurber needlegrass (STTH2)."

4306-08 *"Improve the ecological condition as measured in 1987 from 43% to 50% of PNC by 1996."*

"Achieve a statistically significant upward trend on the key species AGSP by 1996."

4306-09 *"Improve the ecological condition as measured in 1987 from 43% to 50% of PNC by 1996."*

"Achieve a statistically significant upward trend on the key species FEID, STCO4, AGSP, and PUTR2 by 1996."

4306-10 *"Improve the ecological condition as measured in 1987 from 50% to 55% of PNC by 1996."*

"Achieve a statistically significant upward trend on the key species AGSP by 1996."

"Maintain a stable or static trend on the key species FEID by 1996."

4306-11 *"Maintain the ecological condition at 69% of PNC by 1996."*

"Maintain a stable or static trend on the key specie FEID by 1996."

"Achieve a statistically significant upward trend on the key specie PUTR2"

4306-12 *"Maintain the ecological condition at 72% of PNC."*

"Maintain a stable or static trend on the key species AGSP and SIHY."

4306-13 *"Improve the ecological condition as measured in 1987 from 52% to 60% of PNC by 1996."*

"Achieve a statistically significant upward trend on the key species AGSP and PUTR2 by 1996."

4306-14 *"Maintain the ecological condition at 58% of PNC."*

"Maintain a stable or static trend on the key species STTH2."

4306-16 *"Maintain the ecological condition at 89% of PNC."*

"Maintain a stable or static trend on the key specie AGSP."

4306-17 *"Improve the ecological condition as measured in 1987 from 36% to 45% of PNC by 1996."*

"Achieve a statistically significant upward trend on the key specie AGSP by 1996."

4306-19 Develop new objectives for this area following fire rehabilitation.

4306-20 *"Maintain the ecological condition as measured at 80% of PNC."*

"Maintain a stable or static trend on the key species EULA5 and ATNU2."

Riparian Objectives - See tables that follow.

BIG SPRINGS ALLOTMENT				
Location	Baseline Data	Time Frame and Parameters		
		2 Years after Management Changes Implemented ¹	4 Years after Management Changes Implemented ²	Desired Condition
<p>East Squaw Creek - Upper East Squaw Creek Pasture Squaw Creek Ranch Field</p>	<p>Nonfunctional Functional at Risk (Static)</p>	<p>Functional at Risk - Upward Trend Functional at Risk - Upward Trend A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank at the end of the growing season or grazing season, whichever occurs later. Use on current years growth of aspen and willow is 35% or less.</p>	<p>Proper Functioning Condition Proper Functioning Condition A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank at the end of the growing season or grazing season, whichever occurs later. Use on current years growth of aspen and willow is 35% or less. There will be less than 20% hummocking and hoof action of the surface area with recovery occurring after a season of rest.</p>	<p>Based on site potential, a riparian community composed of sedges and rushes, willow, and aspen is expected with at least two age classes of aspen and willow. A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank at the end of the growing season or grazing season, whichever occurs later. Use on current years growth of aspen and willow is 35% or less. There will be less than 20% hummocking and hoof action of the surface area with recovery occurring after a season of rest.</p>
<p>¹ Implementation of interim grazing systems. ² After fencing is completed.</p>				

APPENDIX C

BIG SPRINGS ALLOTMENT				
Location	Baseline Data	Time Frame and Parameters		
		2 Years after Management Changes Implemented¹	4 Years after Management Changes Implemented¹	Desired Condition
Upper Nanny Spring Lower Nanny Spring Adele Spring Milk House Spring	Functioning at Risk to Proper Functioning Condition	Functioning at Risk to Proper Functioning Condition	Proper Functioning Condition	Based on site potential, Upper Nanny and Adele Springs are expected to have a riparian herbaceous community composed primarily of sedges and rushes. At Lower Nanny Spring, there would also be an aspen stand with at least two age classes of aspen expected. At Milk House Spring, there would also be patches of willows.
¹ After exclosures are completed.				

BIG SPRINGS ALLOTMENT				
Location	Baseline Data	Time Frame and Parameters		
		2 Years after Management Changes Implemented¹	4 Years after Management Changes Implemented²	Desired Condition
Other Springs	Nonfunctional and Functional at Risk (Static)	<p>Functional at Risk - Upward Trend</p> <p>A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank and wet meadow areas at the end of the growing season or grazing season, whichever occurs later.</p>	<p>Proper Functioning Condition</p> <p>A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank and wet meadow areas at the end of the growing season or grazing season, whichever occurs later. There will be less than 20% hummocking and hoof action of the surface area with recovery occurring after a season of rest.</p>	<p>Based on site potential of the springs, a riparian herbaceous community composed primarily of sedges and rushes is expected.</p> <p>A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank and wet meadow areas at the end of the growing season or grazing season, whichever occurs later. There will be less than 20% hummocking and hoof action of the surface area with recovery occurring after a season of rest.</p>
<p>¹ Implementation of interim grazing systems or redesign of spring developments that are nonfunctional due to development design.</p> <p>² After fencing is completed or redesign of spring developments that are nonfunctional due to development design.</p>				

BIG SPRINGS ALLOTMENT				
Location	Baseline Data	Time Frame and Parameters		
		2 Years after Management Changes Implemented¹	4 Years after Management Changes Implemented²	Desired Condition
Wally Spring	Nonfunctional	<p>Functional at Risk - Upward Trend</p> <p>A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank at the end of the growing season or grazing season, whichever occurs later.</p> <p>Use on current years growth of aspen and willow is 35% or less.</p>	<p>Proper Functioning Condition</p> <p>A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank at the end of the growing season or grazing season, whichever occurs later. Use on current years growth of aspen and willow is 35% or less. There will be less than 20% hummocking and hoof action of the surface area with recovery occurring after a season of rest.</p>	<p>Based on site potential, a riparian herbaceous community composed primarily of sedges and rushes is expected with some willows at the spring and scattered along the stream course and an aspen stand at the base of the hill on the south side. At least two age classes of aspen and willow are expected.</p> <p>A minimum of four (4) inches average stubble height of selected key herbaceous riparian species (sedges/rushes) will be left along the streambank at the end of the growing season or grazing season, whichever occurs later. Use on current years growth of aspen and willow is 35% or less. There will be less than 20% hummocking and hoof action of the surface area with recovery occurring after a season of rest.</p>
<p>¹ Implementation of interim grazing systems.</p> <p>² After exclosure(s) completed.</p>				

OWYHEE ALLOTMENT

STANDARDS AND GUIDELINES FOR RANGELAND HEALTH

Standard 1. Upland Sites: Upland Soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and land form.

Standard 2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

Standard 3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

Standard 4. Cultural Resources: Land use plans will recognize cultural resources within the context of multiple use.

LAND USE PLAN (ELKO RMP/ROD) OBJECTIVES

1. Maintain or improve the condition of public rangelands to enhance productivity for all rangeland values.
2. Conserve and enhance terrestrial, riparian, and aquatic wildlife habitat.
3. Manage wild horse populations and habitat in the established herd areas consistent with other resource uses.
4. Manage as wilderness those portions of the Wilderness Study Areas that are manageable as wilderness and where wilderness values are capable of balancing other resource values and uses which would be forgone.

OWYHEE ALLOTMENT SPECIFIC OBJECTIVES

a. Short Term Objectives

1. Maximum combined utilization by both livestock and wild horses will not exceed 50% of current year's growth on key herbaceous species for those pastures within the HMA.
 2. Maximum utilization of 50% of current years growth on key herbaceous species by the end of the grazing season within both the Lower and Upper 4-mile Pastures.
 3. Maximum utilization of 60% of current years growth on crested wheatgrass within the Winters Creek Seeding Pasture by the end of the grazing season.
-

b. Longterm objectives as measured at the following key areas:

OW-01

1. Improve or maintain allowable percentages of perennial native grass composition, by weight, from 8% to at least 10-20% to provide forage and cover for wildlife and forage for livestock and wild horses.
2. Improve or maintain allowable percentages of perennial native forb composition, by weight, from a trace amount to at least 5-10% of potential native vegetation to provide forage and cover for wildlife.
3. Improve to or maintain 15% or less absolute shrub canopy foliar cover.
4. Improve to or maintain satisfactory Wyoming big sagebrush form and age class condition as measured by Cole Browse Method.
5. Improve to or maintain at least 9-10% basal cover of residual perennial native grasses.

OW-02/AY-1-01

1. Improve or maintain allowable percentages of perennial native grass composition, by weight, from 8% to at least 10-20% to provide forage and cover for wildlife and forage for livestock and wild horses.
2. Improve or maintain allowable percentages of perennial native forb composition, by weight, from 3% to at least 5-10% of potential native vegetation to provide forage and cover for wildlife.
3. Maintain 15% or less absolute shrub canopy foliar cover.
4. Maintain satisfactory Wyoming big sagebrush form and age class condition as measured by Cole Browse Method.
5. Improve to at least 10% basal cover of residual perennial native grasses.

OW-03

1. Maintain or enhance the current livestock forage value of the Winters Creek Seeding.
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2. Maintain 15% or less absolute shrub canopy foliar cover.

OW-04/AS-T-87-30

1. Maintain or exceed current late seral stage of ecological condition.
2. Maintain 15% or less absolute shrub canopy foliar cover.
3. Maintain satisfactory Wyoming big sagebrush form and age class condition as measured by Cole Browse Method.
4. Improve to, or maintain at least 18% basal cover of residual perennial native grass.

OW-05/DY-T-87-29

1. Improve ecological condition from mid-seral to at least late-seral condition.
2. Maintain 15% or less absolute shrub canopy foliar cover.
3. Maintain satisfactory Wyoming big sagebrush form and age class condition as measured by Cole Browse Method.
4. Improve to at least 12% basal cover of residual perennial native grasses.

OW-06/DY-T-87-28

1. Improve or maintain allowable percentages of perennial native grass composition, by weight, from 8% to at least 10-20% to provide forage and cover for wildlife and forage for livestock.
2. Improve or maintain allowable percentages of perennial native forb composition, by weight, from 4% to at least 5-10% of potential native vegetation to provide forage and cover for wildlife.
3. Maintain 15% or less absolute shrub canopy foliar cover.
4. Maintain satisfactory Wyoming big sagebrush form and age class condition as measured by Cole Browse Method.
5. Improve to at least 13% basal cover of residual perennial native grasses.

OW-07/DY-T-87-31

1. Improve or maintain allowable percentages of perennial native grass composition, by weight, from 8% to at least 10-20% to provide forage and cover for wildlife and forage for livestock and wild horses.
 2. Improve or maintain allowable percentages of perennial native forb composition, by weight, from 1% to at least 5-10% of potential native vegetation to provide forage and cover for wildlife.
-

3. Maintain 15% or less absolute shrub canopy foliar cover.
4. Maintain satisfactory Wyoming big sagebrush form and age class condition as measured by Cole Browse Method.
5. Improve to at least 11-12% basal cover of residual perennial native grasses.

OW-08

1. Improve to or maintain allowable percentages of perennial native grass composition, by weight, from 2% to at least 5-10% to provide forage and cover for wildlife and forage for livestock and wild horses.
2. Improve to or maintain allowable percentages of perennial native forb composition, by weight, from trace amounts to at least 3-5% of potential native vegetation to provide forage and cover for wildlife.

AY-1-02

1. Improve or maintain allowable percentages of perennial native grass composition, by weight, to at least 80-95% to provide forage and cover for wildlife and forage for livestock and wild horses.
2. Improve or maintain perennial native forb composition, by weight, to at least 10-15% of potential native vegetation, including a maximum of five percent composition of povertyweed, to provide forage and cover for wildlife.
3. Maintain satisfactory Bolander silver sagebrush form and age class condition as measured by Cole Browse Method.
4. Improve to, or maintain Bolander silver sagebrush composition, by weight, to at least 2-5% to provide forage and cover for wildlife and forage for livestock and wild horses.

AY-1-03

1. Allowable percentages of perennial grasses and forbs to be determined after baseline data are collected.
 3. Maintain 15% or less absolute shrub canopy foliar cover.
 4. Maintain satisfactory Wyoming big sagebrush form and age class condition as measured by Cole Browse Method.
 5. Improve to at least 9-10% basal cover of residual perennial native grasses.
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AY-T-87-40

1. Allowable percentages of perennial grasses and forbs to be determined after baseline data are collected.
2. Maintain 15% or less absolute shrub canopy foliar cover.
4. Maintain satisfactory Wyoming big sagebrush form and age class condition as measured by Cole Browse Method.
5. Improve to, or maintain at least 12% basal cover of residual perennial native grasses.

c. Wild Horse Objectives

1. Manage wild horses within the Owyhee HMA at the appropriate management level and maintain a thriving, natural ecological balance consistent with other resource needs.
2. Maintain a healthy, viable population of wild horses within the Owyhee HMA.
3. Manage wild horses within the Owyhee HMA in a manner that maintains their wild free-roaming characteristics.

d. Wildlife

1. Manage Rangeland habitat and forage condition to support 242 AUMs for reasonable numbers of mule deer, 485 AUMs for reasonable numbers of pronghorn antelope and 24 AUMs for reasonable numbers of California bighorn sheep.
2. Maintain or improve to at least good condition all crucial mule deer, California bighorn sheep and pronghorn habitat.
3. Manage rangeland to protect or enhance crucial sage grouse strutting, nesting, brood-rearing and winter habitat.
4. Improve and maintain meadow and riparian areas for mule deer, pronghorn antelope and sage grouse.
5. Utilization levels will not exceed 50 percent on meadow and riparian areas.

e. Fisheries/Aquatic and Riparian Habitats

Manage grazing on the Owyhee Allotment to achieve the following short and long-term stream/riparian habitat objectives:

South Fork Owyhee River - Star Ridge Pasture

HABITAT PARAMETERS	1995	SHORT-TERM OBJECTIVE (5 YEARS) ¹	LONG-TERM OBJECTIVE (20yrs) ²
<i>Reach 1 (stream survey stations 17-21)</i>			
Riparian Condition Class (% optimum) ³	45.5	59.2	60.0+ ⁴
Average Woody Vegetation Overhang (in)	0	1.0 ⁵	Maintain or improve
Average Shorewater Depth (in)	0.4	0.5	Maintain or improve
Average Type B Shoreline Riparian Zone (ft) ⁶	3.5	4.6	Maintain or improve
<i>Reach 3 (stream survey stations 6-14)</i>			
Riparian Condition Class (% optimum)	52	60.0+	Maintain or improve
Average Woody Vegetation Overhang (in)	0	1	Maintain or improve
Average Shorewater Depth (in)	0.7	0.9	Maintain or improve
Average Type B Shoreline Riparian Zone (ft) ⁵	3	3.9	Maintain or improve
<i>Reach 4 (stream survey stations 1-5)</i>			
Riparian Condition Class (% optimum)	59	60.0+	Maintain or improve
Average Woody Vegetation Overhang (in)	0.5	0.7	Maintain or improve
Average Shorewater Depth (in)	1.1	1.4	Maintain or improve
Average Type B Shoreline Riparian Zone (ft)	1.6	2.1	Maintain or improve
Proper Functioning Condition (PFC) ⁷		Show progress toward meeting	Achieve

¹ Five years after changes in livestock management are initiated. Short-term objectives are for 30% improvement or to a rating of good as specified in the Land Use Plan.

² Long-term objectives are for attainment of good condition as specified in the Land Use Plan.

- ³ Average of bank cover and bank stability. Optimum is assumed to be 100%.
- ⁴ A rating of 60%+ is considered to represent good conditions.
- ⁵ Although no baseline figures are available, 1.0 inch of overhanging bank vegetation is felt to represent an attainable minimum.

South Fork Owyhee River - Fourmile Pasture

Within five years show progress towards meeting Proper Functioning Condition (PFC). Over the long-term (20 years), achieve PFC.

Bookkeeper Spring

Within five years show progress towards meeting Proper Functioning Condition (PFC). Over the long-term (20 years), achieve PFC.
