

FINDING OF NO SIGNIFICANT IMPACT

HORSESHOE PASTURE RIPARIAN IMPROVEMENT AND LIVESTOCK GRAZING MANAGEMENT STRATEGY

DOI-BLM-OR-L050-2009-0040-EA

The Bureau of Land Management, Lakeview District, Lakeview Resource Area (BLM), has analyzed several alternative proposals to improve riparian conditions within the Horseshoe Pasture and improve livestock grazing management within the surrounding Juniper Mountain Allotment. The alternatives include constructing varying amounts of new pasture division fencing, exclosure fencing, reductions in grazing levels, increased herding, fence removal, and treatment of young invasive juniper trees.

The Council on Environmental Quality (CEQ) regulations state that the significance of impacts must be determined in terms of both context and intensity (40 CFR 1508.27). The context of the proposed project is the Juniper Mountain grazing allotment (0515). For this reason, the analysis of impacts in the attached Environmental Assessment (EA) is focused appropriately at this scale. The CEQ regulations also include the following ten considerations for evaluating the intensity of impacts:

- 1) Would any of the alternatives have significant beneficial or adverse impacts (40 CFR 1508.27(b)(1)?
() Yes (X) No

Rationale: Based on the analysis contained in the attached EA, none of the 10 alternatives would have either significant beneficial or adverse impacts on the human environment. There are no prime or unique farmlands, areas of native American religious concern, wild horse management areas, wild and scenic rivers, significant caves, designated wilderness areas, wilderness study areas, other areas with wilderness characteristics, or hazardous waste sites located in the project area. No impacts would occur to low income or minority populations. Neither adverse nor beneficial impacts are anticipated to air quality, floodplains, land tenure, or mineral and energy resources (pages 3-4, 21).

Potential impacts to hydrology, water quality, soils, biotic crusts, vegetation, noxious weeds, special status plants, wildlife habitat, special status animals, ACEC/RNAs, livestock grazing management, recreation, visual quality, cultural and historic resources, economic conditions, and climate anticipated by the various alternatives have been analyzed in detail within Chapters 4 and 5 of the attached EA and found not to be significant (pages 21-72).

- 2) Would any of the alternatives have significant adverse impacts on public health and safety (40 CFR 1508.27(b)(2)? () Yes (X) No

Rationale: None of the 10 alternatives analyzed in detail in the attached EA would have significant impacts on public health or safety because the project area is not located near any populated rural or urban area. For this reason, there would also be no impacts to low income or minority populations (page 21). Further, there are no known hazardous waste sites in the project area (page 21). Neither adverse nor beneficial impacts are anticipated to air quality within and surrounding the project area (page 21). There are no drinking water sources located in the project area (page 11). Potential impacts to water quality in the project area have been analyzed in the attached EA and found not to be significant (pages 11, 21, 25, 29-30, 33, 36, 39-40, 43, 48, 52, and 56).

- 3) Would any of the alternatives have significant adverse impacts on unique geographic characteristics (cultural or historic resources, park lands, prime and unique farmlands, wetlands, wild and scenic rivers, designated wilderness or wilderness study areas, or ecologically critical areas (*ACECs, RNAs, significant caves*)) (40 CFR 1508.27(b)(3)? () Yes (X) No

Rationale: There are no park lands, prime or unique farmlands, wild and scenic rivers, significant caves, designated wilderness areas, or wilderness study areas located in the project area (page 21).

Impacts to riparian and ACEC/RNA values have been analyzed in the attached EA and found not to be significant (pages 14, 19, 22-23, 26-27, 30-31, 34, 37, 40-41, 44-45, 48-50, 53-54, 57, and 58).

4) Would any of the alternatives have highly controversial effects (40 CFR 1508.27(b)(4))? () Yes (X) No

Rationale: The BLM has extensive expertise planning, analyzing impacts, and implementing rangeland projects such as those proposed by the 10 alternatives addressed in the attached EA. The potential impacts of these range management actions on hydrology, water quality, soils, biotic crusts, vegetation, noxious weeds, special status plants, wildlife, special status animals, ACEC/RNAs, livestock grazing management, recreation, visual quality, cultural and historic resources, economic conditions, and climate can be reasonably predicted based on existing science and professional expertise. The attached EA analyzed these impacts (pages 21-72). The nature of these impacts is not highly controversial, nor is there substantial dispute within the scientific community regarding the nature of these effects.

The public has been given several opportunities to comment on the analysis of effects. The EA has been revised several times to address these comments and respond to subsequent appeals/litigation (refer to the Public Involvement section of Chapter 1 of the attached EA). Based on comments received during the latest public review, it is evident that some publics believe that:

- a) wilderness characteristics are present in the project area and an analysis of wilderness characteristic impacts should be included in the EA.
- b) a new rangeland health assessment should be conducted to replace the one completed in 2004.

In both cases, the parties are merely expressing disagreement with the results of BLM's inventory or assessment findings (pages 1-4), rather than providing substantial controversy about the nature of effects. For this reason, the BLM finds that there are not any highly controversial effects, as defined under 40 CFR 1508.27(b)(4).

5) Would any of the alternatives have highly uncertain effects or involve unique or unknown risks (40 CFR 1508.27(b)(5))? () Yes (X) No

Rationale: The BLM has extensive expertise planning, analyzing impacts, and implementing rangeland projects such as those proposed by the 10 alternatives addressed in the attached EA. The potential impacts of these range management actions on hydrology, water quality, soils, biotic crusts, vegetation, noxious weeds, special status plants, wildlife, special status animals, ACEC/RNAs, livestock grazing management, recreation, visual quality, cultural and historic, and climate can be reasonably predicted based on existing science and professional expertise. The attached EA analyzed these impacts (pages 21-72). The nature of these impacts is not highly uncertain nor does it involve unique or unknown risks.

6) Would any of the alternatives establish a precedent for future actions with significant impacts (40 CFR 1508.27(b)(6))? () Yes (X) No

Rationale: The BLM has extensive expertise planning, analyzing impacts, and implementing rangeland projects such as those proposed by the 10 alternatives addressed in the attached EA. None of the alternative actions represents a new, precedent-setting range management technique or would establish a precedent for future similar actions with potentially significant effects.

7) Are any of the alternatives related to other actions with potentially significant cumulative impacts (40 CFR 1508.27(b)(7))? () Yes (X) No

Rationale: Based on the analysis contained within the Cumulative Effects section of Chapter 5 of the attached EA, none of the 10 alternatives would have significant cumulative effects within the project area, even when added to the effects of other past, present, and reasonably foreseeable future actions (pages 63-72).

8) Would any of the alternatives have significant adverse impacts on scientific, cultural, or historic resources, including those listed or eligible for listing on the National Register of Historic Resources (40 CFR 1508.27(b)(8))? () Yes (X) No

Rationale: There are no areas of native American religious concern in the project area (page 21). Potential impacts to cultural and historic resources have been analyzed in Chapter 4 of the attached EA and found not to be significant (pages 19-20, 24, 28, 32, 35, 38, 41, 46, 50-51, 55, 59).

9) Would any of the alternatives have significant adverse impacts on threatened or endangered species or their critical habitat (40 CFR 1508.27(b)(9)? Yes No

Rationale: There are no threatened or endangered species or designated critical habitat within the project area (pages 15-15, 18-19, and 21).

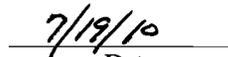
10) Would any of the alternatives have effects that threaten to violate Federal, State, or local law or requirements imposed for the protection of the environment (40 CFR 1508.27(b)(10)? Yes No

Rationale: All of the 10 alternatives analyzed in the attached EA would comply with all Federal, State, and local environmental laws or other environmental requirements. In accordance with the Federal Land Policy and Management Act, the alternatives were reviewed for conformance with the current land use plan and other applicable plans and policies. The purpose and need for the proposed action conforms with the management direction contained in the *Lakeview Resource Management Plan/Record of Decision* (BLM 2003b) and the *Integrated Noxious Weed Control Program* (BLM 2004a). The alternatives comply with the requirements of *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington* (BLM 1997) and the *Greater Sage-Grouse Conservation Strategy and Assessment for Oregon* (ODFW 2005) in varying degrees, as described in the attached EA (pages 4-5). The EA conforms with the requirements of the National Environmental Policy Act.

Finding

On the basis of the analysis contained in the attached EA, the consideration of intensity factors described above, and all other available information, my determination is that none of the alternatives analyzed would constitute a major federal action which would have significant adverse or beneficial impacts on the quality of the human environment. Therefore, an Environmental Impact Statement (EIS) is unnecessary and will not be prepared.


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Date

HORSESHOE PASTURE RIPARIAN IMPROVEMENT AND LIVESTOCK GRAZING MANAGEMENT STRATEGY

ENVIRONMENTAL ASSESSMENT DOI-BLM-OR-L050-2009-0040-EA

CHAPTER I - INTRODUCTION

BACKGROUND

The Juniper Mountain Allotment (#0515) is located in central eastern Lake County and central western Harney County, Oregon (Map 1). The Juniper Mountain Allotment consists of approximately 91,720 acres of Bureau of Land Management (BLM) administered land, currently divided into six pastures (Juniper Mountain, Horseshoe, Radio Springs, Eagle Butte, Sagebrush Knoll, and Flint Hills) and administered under one grazing permit (Map 2).

The Horseshoe Meadow is approximately 50 acres and is located within the Horseshoe Pasture. This pasture is grazed, along with the five other pastures, as part of a rest-rotation grazing system. Juniper Mountain proper is a geographic feature that serves as the hub of four pastures in the northern part of the allotment, but fences are constructed only partially up the sides of the mountain (Map 2). At the time the existing fences were constructed, it was thought that the topography of the mountain slopes would serve as an effective barrier and cattle would not climb up the steep slopes and travel around the ends of the pasture fences. However, field observations have shown that some cattle do move from pasture to pasture, climbing up over the top of Juniper Mountain around the ends of the existing fences, ending up in the Horseshoe Pasture and concentrating in the meadow area during late summer.

Rangeland Health Assessment

A Rangeland Health Assessment for the Juniper Mountain Allotment (#0515) was completed by an interdisciplinary (ID) team in September 2004. The rangeland health assessment found that rangelands across most of the allotment were in good shape overall and met most health standards (BLM 2004c). However, the Horseshoe Meadow area (50 acres) was identified as not meeting Standard 2 (Riparian-Wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform) due to unauthorized grazing use. The assessment also noted that the existing Horseshoe Spring enclosure fence needed maintenance and was too small (0.5 acre) to protect the spring and associated riparian area (BLM 2004c).

Interim Livestock Grazing Management

The grazing regulations require that the BLM make changes to livestock grazing management by the next grazing season, once it has been determined that an area does not meet the Standards for Rangeland Health and where livestock was found to be the causal factor. To comply with this mandate, the BLM worked with the permittee to implement an interim livestock grazing management strategy while a permanent solution was developed and the environmental analysis was completed. The implementation of a permanent solution has been delayed for a variety of reasons, as described later in this document, but the interim strategy has remained in place and is described in more detail in the livestock grazing management section under the Chapter II – Alternatives and Chapter 3 - Affected Environment portions of this document.

PUBLIC INVOLVEMENT, AGENCY COORDINATION, NATIVE AMERICAN CONSULTATION, AND ISSUES RAISED

Initial EA and Decision

In February 2005, the ID team completed an environmental assessment (EA#OR-015-2005-01; BLM 2005b) evaluating the impacts of several alternative courses of action to address the rangeland health issue in the Horseshoe Pasture. Public coordination and Native American consultation for this proposal included notifying all interested government agencies, groups, tribes, and individuals of the availability of the EA/FONSI for a 30-day comment

period via a letter dated March 1, 2005. In addition, a notice of document availability was published the *Lake County Examiner*. These documents were also posted on the Lakeview District's planning webpage.

One organization requested a copy of the EA and the Rangeland Health Assessment and provided comments on the EA during the comment period. The BLM subsequently transmitted a response to these comments along with the proposed decision on April 7, 2005. The organization protested the proposed decision on April 25, 2005. The BLM responded to the protest and issued a final decision on June 20, 2005. The organization filed an appeal of the final decision with the Department of Interior's Office of Hearings and Appeals along with a petition for stay of the decision. An Administrative Law Judge (ALJ) denied the petition for stay on September 7, 2005. A grazing schedule for the 2006 grazing season was authorized on February 15, 2006, which included early spring grazing use in the Horseshoe Pasture with the expectation that the fence would be constructed by late spring, by the time grazing use was shifted to other northern pastures. However, the appellant filed suit in Federal court on April 3, 2006. The BLM rescinded its decision in May 2006 and project construction was put on hold.

2006 Settlement Agreement

The BLM reached a settlement agreement with the plaintiff in August of 2006. The main issues raised in the plaintiff's previous comments, protest, appeal, and litigation related to:

- 1) adequacy of the range of alternatives,
- 2) need to address impacts to sage-grouse, pygmy rabbits, microbiotic crusts, and wilderness values, including cumulative impacts to these resource values
- 3) need to consider new information, including a wilderness inventory provided by the plaintiff,
- 4) need to collect or update relevant information on the wilderness resource on its own, and
- 5) need to make changes to the existing grazing management to comply with the rangeland health regulations.

Field Meetings

The BLM met in the field with the plaintiff on September 22, 2006, to discuss potential wilderness characteristics of the Juniper Mountain Allotment, as well as the environmental analysis for the proposed project. In early October 2006, the BLM also met in the field with the permittee, a consultant, several range management professors from Oregon State University, and other interested parties to discuss conditions in the Horseshoe Pasture (see trip report dated September 22, 2006). On December 12, 2006, the permittee sent the BLM a letter containing their own field trip report and comments regarding the proposal.

Revised EA and Decision

The BLM subsequently revised the EA to address issues expressed in the 2006 settlement agreement and re-issued the EA (#OR-015-2005-01) and FONSI for an additional 30-day public comment period in March of 2007 (BLM 2007). The BLM received additional comments on the EA on April 6, 2007. The BLM reviewed these comments and mailed response letters (May 3, 2007) to the commenting parties addressing their comments.

The BLM issued its second proposed decision on May 3, 2007. The final decision was appealed to the Department of Interior's Office of Hearings and Appeals along with a petition for stay on June 6, 2007. The stay was granted by an Administrative Law Judge (ALJ) on July 6, 2007. The permittee requested and was granted intervener status on September 7, 2007. The BLM subsequently entered into settlement discussions with both parties. A settlement was reached and all parties submitted a joint motion to vacate the decision in January 2008. The motion to vacate and remand the decision was granted by the ALJ on January 15, 2008.

2008 Settlement Agreement

In the January 2008 settlement agreement, the BLM agreed to prepare a revised wilderness character evaluation and EA and specifically to address the following:

1. Within the EA, analyze at least one additional alternative for a project addressing rangeland health concerns in the Horseshoe Pasture.

2. Revise its wilderness character evaluation for lands within the project area and document:
 - a. BLM's field inventory procedures,
 - b. BLM's consideration of ONDA's wilderness inventory report, and
 - c. Consider the environmental consequences of the alternatives on any wilderness resource that the BLM finds to be present in the project area within the EA.
3. Make the revised EA available for public comment prior to making a final decision.
4. Within the EA, fully analyze an alternative that would:
 - a. Have a pasture division fence along the rim or sides of the Horseshoe formation (approximately 5 miles of fence).
 - b. Retain the 2 existing gates in existing fences defining the north and south boundaries of the Horseshoe Pasture (no cattle guards would be installed).
 - c. Have an additional 2 miles of fence on the Horseshoe formation running parallel to and east of BLM Road 7155-A0 to create an enclosure. This would divide the Horseshoe Pasture into 2 parts. The eastern half would be permanently excluded from grazing. The western half would continue to be grazed as part of the rest-rotation grazing system.
 - d. Permanently close BLM Road 7155-AA, extending up to the top of the Horseshoe formation, to vehicle use following completion of the enclosure fence described in 4(c).
5. Within the EA, analyze an alternative that is the same as the preferred alternative from the previous EA.

Additional Comments and Issues

During the preparation of the current revised EA, the BLM received comment letters or emails from the legal counsel for the permittee (February 28, 2008) and from two Oregon State University range management professors (dated March 31, and October 7, 2008). Two of the correspondents requested that the BLM undertake a new Rangeland Health Assessment and/or conduct further monitoring in the Horseshoe Pasture. In fact, the BLM has conducted additional monitoring (utilization, compliance checks and photo monitoring) within the Horseshoe Pasture since 2004. This monitoring activity is discussed further in the livestock grazing management portion of the affected environment section. The BLM does not intend to conduct a new Rangeland Health Assessment at this time because there has not yet been a permanent solution reached to stop cattle drifting over Juniper Mountain into the Horseshoe Meadow area (during periods of scheduled rest) which would allow riparian conditions to move towards meeting rangeland health standard 2.

The correspondences from the other professor presented his views on the need for, and effective methods of treating young, invasive western juniper in and around the Horseshoe Meadow in the Horseshoe Pasture. This issue is addressed further in the analysis of Alternative 2B.

During the 2008 settlement discussions, legal counsel for the permittee submitted a letter (October 19, 2007) to the BLM regarding an alternative proposal for consideration in the revised EA. This proposal is addressed further in the analysis of Alternative 8. Alternative 8 also includes additional fences proposed by the permittee. Alternative 9 includes analysis of an additional proposal submitted by the permittee during the development of the 2008 settlement agreement.

Another letter was received from the (August 7, 2008) which provided additional photos, documentation of current road use, and a memo from a former Lakeview BLM District Manager documenting historic road construction and maintenance activities in the vicinity of Juniper Mountain. This information was considered during the preparation of the wilderness character evaluation described in the following section.

Wilderness Inventory

The Oregon Natural Desert Association (ONDA) provided the BLM with its wilderness inventory information in April 2005 (ONDA 2005). This inventory identified about 67,948 acres encompassing most of the Juniper Mountain Allotment as a proposed Wilderness Study Area (WSA). The BLM formally reviewed this new information to verify the accuracy of the information and determine if there was a need to modify its existing wilderness inventory (BLM 1980; 1989, 1991). This BLM initially evaluated this proposal and first published its inventory findings in Appendix A of the previous revised EA (BLM 2007). ONDA provided additional photos to the BLM in November 2007.

As laid out in the 2008 settlement agreement described above, the BLM revised its wilderness character evaluation for the Juniper Mountain area. The guidance and process that the BLM followed for this revised evaluation was also documented (BLM 2007b, BLM 2008a). During this latest evaluation, the BLM considered ONDA's 2005 inventory information (including 2004 and 2007 photos), information provided by the permittee and a former BLM Manager (described above), and field information (including recent photos) collected by the BLM. The results of this evaluation were provided to ONDA and the permittee in December 2008 and were also published on the Lakeview District BLM's webpage (<http://www.blm.gov/or/districts/lakeview/plans/inventas.php>).

In summary, the BLM found that the proposed wilderness study area is not one large roadless area, but is six smaller roadless units separated by routes that meet the BLM's inventory definition of a boundary road. Four of these inventory units met the minimum 5,000 acre size requirement and two did not. The BLM did not find any unit that met all of the required wilderness criteria (roadless area covering 5,000 or more acres, in a predominantly natural condition, and having an outstanding opportunity either for solitude or for primitive or unconfined recreation) (BLM 2008b). The BLM found that conditions have not changed substantially within the surrounding area and, therefore, the current findings are similar to BLM's 1980 determination that inventory units in the area lacked wilderness character (BLM 1980).

For this reason, the BLM determined that the information submitted by ONDA does not represent new information that demonstrates the presence of wilderness character in the area. Therefore, wilderness character need not and will not be considered further within this EA. See *ONDA, Western Watersheds Project*, 173 IBLA 348, 354 (2008).

Revised EA

This EA has been revised to address all of the issues listed in the 2008 settlement agreement (described above) and is now being made available to the public, tribes, and government agencies for a 30-day review in both hardcopy and electronic formats.

PURPOSE AND NEED FOR ACTION

As discussed in the Introduction Section above, a Rangeland Health Assessment was conducted by an ID team in 2004 which found that the small (less than 50 acres) wet meadow area within the Horseshoe Pasture failed to meet Rangeland Health Standard 2 (watershed function-riparian/wetland areas) due to unauthorized livestock grazing use. The ID team made several recommendations on how to improve conditions of the meadow area (BLM 2004c).

The purpose and need for the proposal is to take appropriate action that will result in meeting or making significant progress in meeting Standard 2 within the Horseshoe Pasture of the Juniper Mountain Allotment (#0515). Appropriate actions would include consideration of the ID team's recommendations to restore wet meadow condition and riparian function (BLM 2004c), as well as, options that allow livestock grazing to continue at appropriate forage allocation levels across the remainder of the allotment. Attainment of the riparian objective would be measured by observing an increase in desirable, native wet meadow vegetation, and increase in the capture and storage of water, and an improvement in habitat quality within the Horseshoe Meadow.

An additional purpose is to provide a more effective rest-rotation grazing system in the northern pastures that promotes better overall livestock management within the allotment (ie. livestock remain in the scheduled pasture(s) during the rotation and do not drift into surrounding pastures during times when they are scheduled for rest), such that conditions in the majority of the 91,720-acre allotment continue to meet all five rangeland health standards into the foreseeable future.

CONFORMANCE WITH EXISTING PLANS, REGULATIONS, AND POLICIES

The proposed alternatives are in conformance with applicable State, local, and tribal laws, regulations and/or land use plans. The proposed alternatives have been determined to be in conformance with the goals and/or objectives of the following applicable BLM plans, strategies, policies, or guidelines:

1) *Lakeview Resource Management Plan/Record of Decision (RMP/ROD; BLM 2003b)*, including but not limited to

Tables R-1, R-2, R-3, and R-4, pages 8-16; Desired Range of Conditions, pages 23-24; Management Decisions related to Plant Communities, pages 27-38, Wildlife and Wildlife Habitat, pages 44-51, Special Status Animal Species, pages 51-52, Livestock Grazing, pages 52-55, Special Management Areas, pages 57-60, 66-67, 70-73; Cultural Resources, pages 74-79; Human Uses and Values, pages 79-80; Recreation, pages 83-86; Off-Highway Vehicles, pages 86-88; Visual, page 88; Roads and Transportation, pages 95-99; Appendix D – Best Management Practices, pages A-2 – A-7; Appendix E – Livestock Grazing, pages A-8 – A-9, A-99, A-142 – A-148; and Appendix G – Noxious Weeds, page A-165; and Fire Management pages 81-83.

The stated purpose of the proposed action is in conformance with the *Lakeview RMP/ROD* (BLM 2003b), Appendix E1, page A-87, “Management direction: Improve livestock management and distribution through improved management practices, installation of livestock management facilities (such as fences and water sources), and/or other actions as opportunities arise.” In addition, the management direction for the Juniper Mountain Area of Critical Environmental Concern/Research Natural Area (ACEC/RNA; page 67), states “where adverse impacts are identified, existing livestock use will be adjusted using a variety of methods, including, but not limited to, fencing, reduction in livestock numbers, and changes in grazing season of use. Proposed range improvement projects will be evaluated for impacts and permitted where relevant and important values will be maintained or enhanced.”

2) *Integrated Noxious Weed Control Program, EA#OR-010-2004-03* (BLM 2004a) – this document tiered to the noxious weed management direction in the *Lakeview RMP/ROD* and provided more specific details on the locations of known noxious weed sites in the Lakeview Resource Area and how periodic treatments would be conducted on these sites, as well as new sites discovered during future inventory. The treatment methods addressed in this plan included cultural, mechanical, biological, and chemical. The type of treatment used and the frequency of treatment would be based on site/plant characteristics, treatment priorities identified in the plan, and budget.

3) *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington* (BLM 1997) – The Rangeland Reform '94 ROD required the BLM to develop regional rangeland health standards and complete health assessments for all grazing allotments by the end of 2008. In 1997, the Oregon/Washington State Director fulfilled one of these requirements by approving rangeland health standards and guidelines for Oregon and Washington. These standards and guidelines were developed with public participation and included the formation of and review by, a number of regional resource advisory committees (RACs). The Lakeview Resource Area completed a rangeland health assessment for the Juniper Mountain Allotment in 2004 (BLM 2004c), in accordance with the other main requirement of this ROD. The results of the rangeland health assessment for this allotment were summarized previously in this document. The proposed action and many of the alternatives analyzed in this EA were developed specifically to address this failure to meet Standard 2 within the Horseshoe Meadow portion of the allotment.

4) *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon* (ODFW 2005). This strategy replaced both the interim state guidelines and an existing national strategy (BLM 2004b). Conformance with this plan is discussed within the Wildlife Impacts section.

CHAPTER II - ALTERNATIVES

INTRODUCTION

The range of alternatives in any NEPA analysis is determined by the purpose and need of the proposed action, as defined by the federal agency having the authority to propose and carry out the action. In this EA, the BLM considered a total of 10 alternatives in detail. Three additional alternatives were considered, but dropped from detailed analysis for the reasons described later in the following section.

ALTERNATIVES ANALYZED IN DETAIL

Actions Common to All Alternatives

The Lakeview RMP/ROD (2003) made a decision to close BLM Road 7155-AA. However, the closure has not yet been implemented on the ground due to other management priorities. This closure would be implemented on the ground as a

component of each or the ten alternatives analyzed in detail. The timeframe for when the closure would occur would depend upon the alternative selected. The effects of closing this road are discussed in the cumulative impacts section.

Future drought conditions within the allotment would be handled in accordance with current drought management regulations and policies, including but not limited to: 1) Washington Office Instruction Memorandum (IM) No. 2003-074, and 2) the Lakeview RMP/ROD (page 53) grazing management direction which states that livestock grazing will be managed during and following drought in accordance with the current “Oregon and Washington Drought Policy” .

Actions Common to All Alternatives that Include Fencing

Fence construction activities may include: brushing out vegetation within 10-foot wide swath along the fence line with chain saws, building of rock jacks, travel up and down the fence corridor with an all-terrain vehicle (ATV) or pickups to move fence supplies and lay/stretch the wires, and limbing of live old-growth junipers (up to shoulder height) in the fence line where applicable. Dead junipers in the fence line would be felled. The frequency of trips would be limited to the minimum necessary to complete the project and would be controlled to prevent the development of new trails on the landscape. These disturbances would be short term, occurring only during the construction phase and would be largely unnoticeable within a few years of completion of the project. If new routes are created along the fence line, they would be signed closed or rehabilitated if necessary.

Fences would consist of a three-strand barbed wire built to standard BLM wildlife passage specifications (BLM 1988). The bottom wire would be smooth and at least 18 inches off the ground. The top wire would be no higher than 42 inches. The posts would consist of 66-inch steel posts, and rock cribs would be constructed as braces. Any portion of fences proposed within 0.5 miles of an active lek would have reflectors installed to increase visibility and mitigate potential impacts to sage-grouse from collisions with the new fence.

Some proposed fence alignments considered within this analysis have not had botanical or cultural surveys completed. All surveys would need to be completed prior to fence construction occurring on the ground, if one of these alternative alignments is selected as the final agency decision. The final fence alignment would be adjusted to avoid any cultural or special status plant species sites located during the survey.

ALTERNATIVE 1 - NO ACTION

This alternative would consist of making no modifications to the existing fences, rest-rotation grazing system, or other grazing management practices (ie. herding) within the allotment. Grazing would continue on the allotment in accordance with the forage allocation, season of use, and other management direction specified in the *Lakeview RMP/ROD* (BLM 2003b) and 10-year grazing permit. Currently, the active preference or forage allocation for the Juniper Mountain Allotment is 3,651 animal unit months (AUM's) active preference, 796 AUMs suspended, with a total preference of 4,447 AUM's. The permitted season of use runs from March 16th thru October 31st. The current grazing system is managed as a rest-rotation system. The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting (with the Range Management Specialist and the Permittee). Limited herding would continue to be used to move cattle between pastures as dictated by the approved annual grazing schedule. Herding would generally not be used on a regular basis to keep unauthorized cattle out of the Horseshoe Meadow area during scheduled seasons of rest.

ALTERNATIVE 2A – FENCING JUNIPER MOUNTAIN

This alternative would involve building approximately 5 miles of new fence along the ridge line and side slopes of Juniper Mountain (Map 3). The location of the fence is described further under the Livestock Grazing Management Section, under Alternative 2A of Chapter 4 (Environmental Consequences).

The new fence would consist of three strands of wire (two barbed and one smooth) and would tie the existing pasture fences together providing better control of cattle in each pasture while improving management of the wet meadow resources within the Horseshoe Pasture. A small gate or a pedestrian fence crossing would be installed in the fence at the top of Juniper Mountain near to provide access to existing primitive campsites in the area.

Two new cattle guards would also be installed along the main road (7155-A0) leading into and out of the Horseshoe Pasture.

Grazing would continue on the allotment in accordance with the forage allocation (3,651 active, 796 suspended AUMs), season of use (March 16th to October 31st), and other management direction specified in the *Lakeview RMP/ROD* (BLM 2003b) and 10-year grazing permit.

The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting. The Horseshoe Pasture would be used in the early spring most years. In the case of drought, the pasture could be used at other times (though not season long) during the summer (no more than once every 5 years), as long as it is followed by a year of rest.

Standard weed prevention procedures outlined in the *Integrated Weed Management Program* (BLM 2004a) and the *Lakeview RMP/ROD*, Appendix D - Best Management Practices, Noxious Weed Management section, page A-6 (BLM 2003b) would be followed during project implementation. Limited herding would be used to move cattle between pastures as dictated by the annual grazing schedule.

ALTERNATIVE 2B – FENCING JUNIPER MOUNTAIN AND ENHANCED RESTORATION

This alternative includes the same fence, pedestrian gate, and cattle guard construction actions described above for Alternative 2A above (Map 3), plus the additional restoration activities described below. The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting similar to Alternative 2B.

Enhanced restoration activities would include treating the young, invasive (non-old growth) western juniper trees in and around the Horseshoe Meadow area in the Horseshoe Pasture. Treatment would include cutting and leaving approximately 50 acres of scattered juniper with both hand saws and chainsaws

Restoration activities would include stabilization of the headcuts occurring in the meadow area. These headcuts are in various stages of development, and are at risk for further movement. Actions could include the addition of rock and/or wood to the headcut sites, reshaping the channel and relaxing the slope of the nick point, and/or the planting of appropriate riparian vegetation. To further speed recovery of the system, in-channel check dams may be installed to raise the base level of the channel downstream of the headcuts.

ALTERNATIVE 3 - REDUCED GRAZING LEVELS

This alternative would consist of significantly reducing grazing levels on the entire Juniper Mountain Allotment. This alternative would permanently reduce active preference from the current 3,651 AUMs to 1,826 AUMs (50% reduction). The season of use (March 16th thru October 31st) and rest-rotation grazing system would be similar to Alternative 1. No new fencing or cattle guards would be installed or constructed. The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting. Limited herding would be used to move cattle between pastures as dictated by the annual grazing schedule.

ALTERNATIVE 4 – FULL REST EVERY OTHER YEAR

This alternative would consist of making full permitted use (3,651 AUMs) of the entire Juniper Mountain Allotment one year and resting the entire allotment the following year. The season of use during grazed years would be from March 16th through October 31st. Livestock would be placed into 1 or 2 pastures at the beginning of the season and then subsequently rotated to other pastures as the season progressed. No new fencing or cattle guards would be constructed. The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting. Limited herding would be used to move cattle between pastures as dictated by the annual grazing schedule.

ALTERNATIVE 5 – INCREASED HERDING

Under this alternative, the permittee would be required to keep livestock out of the Horseshoe Pasture during periods of scheduled rest solely through the use of herding techniques. This would require at least daily patrols of the Horseshoe Pasture when cattle are authorized to use adjacent pastures. Grazing would continue on the allotment in accordance with the forage allocation (3,651 active, 796 suspended AUMs), season of use (March 16th through October 31st), and other management direction specified in the *Lakeview RMP/ROD* (BLM 2003b) and 10-year grazing permit. No additional fencing or cattle guards would be constructed. The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting. Herding would be also used to move cattle between pastures as dictated by the annual grazing schedule.

ALTERNATIVE 6 – PERMANENT REMOVAL OF GRAZING IN THE EAST HALF OF THE HORSESHOE PASTURE

This alternative would consist of building approximately five miles of fence along the ridgeline or side slopes of Juniper Mountain similar to Alternatives 2A and 2B. This fence would tie the existing pasture division fences together. An additional two miles of fence would be built running parallel and to the east of BLM Road 7155-A0, effectively dividing the Horseshoe Pasture in two. The eastern half would be permanently excluded from livestock grazing. The western half of the pasture would be grazed as part of the existing rest-rotation grazing system. Both fences would consist of three strands of wire (two barbed and one smooth) (Map 4). The two existing gates, where the north and south boundary fences of the Horseshoe Pasture intersect BLM Road 7155-A0, would remain in place and no cattle guards would be installed. The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting.

ALTERNATIVE 7 - PERMANENT REMOVAL OF GRAZING IN HORSESHOE PASTURE

This alternative would consist of constructing the five-mile Horseshoe Fence (as described under Alternatives 2A, 2B, 6, and 8), but would then permanently eliminate grazing within the entire Horseshoe Pasture. In addition, the existing gates would be locked on BLM Road 7155-A0 leading into the Horseshoe Pasture (in the same general location as the cattle guards proposed under Alternatives 2A and 2B) and all roads in the pasture would be closed to vehicle travel (except for emergency vehicles). No cattle guards would be installed, but pedestrian passage would be provided at the road crossing/gate locations.

The existing waterholes, reservoirs, and wildlife guzzler within the pasture would remain following closure to provide water for wildlife, but only the guzzler would be maintained in the future. The developments at Horseshoe Spring (exclosure fence, pipe, water trough and overflow reservoir) would be removed and reclaimed, as well as other non-historic manmade structures (the remaining reservoirs within the Horseshoe Pasture). Erosion control measures (i.e. jute matting installation, planting, juniper placement) would be employed as necessary to stabilize disturbed areas and minimize soil loss. Active restoration measures similar to Alternative 2B would be implemented in the Horseshoe Meadow.

Grazing use would continue in the remaining pastures of the allotment on a rest-rotation system subject to the same season of use described in Alternative 1. The turnout and gather dates for each of the other pastures in the allotment would continue to be decided upon in the annual authorization meeting. Herding would be used to move cattle between the remaining pastures as dictated by the annual grazing schedule.

ALTERNATIVE 8 – HORSESHOE MEADOW CLOSURE AND ADDITIONAL PASTURE FENCING

This alternative would include building the five mile fence along the rim of Juniper Mountain (as described under Alternatives 2A, 2B, 6, and 7). An additional two miles of fence would be constructed running parallel and east of BLM Road 7155-A0, dividing the Horseshoe Pasture in two (similar to Alternative 6). The eastern half would be closed (indefinitely) to livestock grazing. The western half of the Horseshoe Pasture would be grazed as part of the Juniper Mountain Allotment's rest-rotation grazing system (Map 5).

Closing the east half of the Horseshoe Pasture indefinitely would allow grazing at some point in the future for the following reasons: 1) to provide rest for other portions of the allotment in case of wildfire or drought and, 2) to

reduce fuel loading.

The above described fence would be accompanied by one or both of the following additional fence options:

1) The first additional fence option includes approximately 15 mile of new fence constructed to divide the Sagebrush Knoll Pasture in half, and would then run south along the west side of the Corn Lake Road (6165-00) in the Flint Hills Pasture, dividing it in half (Sagebrush Knoll Pasture Division Fence; Map 5). A cattle guard would be installed where the fence crosses County Road 3-10 in the south portion of the allotment.

2) The second additional fence option is approximately 7 ½ miles of fence splitting the Eagle Butte Pasture in half from east to west (Eagle Butte Pasture Division Fence; Map 5).

This would create a total of 8 or 9 smaller pastures that would be managed in rest-rotation grazing system dictated by an annual grazing schedule. The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting.

ALTERNATIVE 9 – FENCE REMOVAL

This alternative includes both removing and constructing fences. The existing fence (1.7 miles) on the north end of the Horseshoe Pasture would be removed. Approximately 3 miles of new fence would be constructed starting from the drift fence at the northwest corner of the Radio Springs Pasture. This fence would extend west, up the side of Juniper Mountain, then follow the ridgeline of Juniper Mountain (heading south west), and tie into the existing south fence of the Horseshoe Pasture. Under this proposal, the area within what is now the Horseshoe Pasture would be managed as part of a larger Big Juniper Pasture (Map 6). Use in the majority of the pastures would continue under a rest-rotation system where each pasture is grazed (during the growing season), deferred (after seed ripe) and rested on a 3-year schedule. The enlarged Big Juniper Pasture would be used early one year and rested the following year. The turnout and gather dates for each pasture of the allotment would continue to be decided upon in the annual authorization meeting.

ALTERNATIVES CONSIDERED BUT DROPPED FROM DETAILED ANALYSIS

Alternative 10 – Permanent Removal of Grazing within Entire Allotment

This alternative would involve permanent removal of livestock grazing from the entire allotment. The allotment-specific management direction in the Lakeview RMP/ROD (BLM 2003b; page A-85) allows for the flexibility of “adjusting permitted use as needed” and 43 CFR Part 4110.3 does allow for making reductions in permitted use under the provisions of 43 CFR Part 4160. However, such adjustment or reduction decisions, including complete removal of grazing, “*must be supported by monitoring data, an allotment evaluation, or Rangeland Health Assessment findings*”.

The recent Rangeland Health Assessment for this allotment found that range conditions across the allotment as a whole met all 5 standards (BLM 2004c). The small, localized riparian problem was found on about 50 acres of the 91,720-acre allotment. The overall findings do not support or justify consideration of such a drastic, allotment-wide change in management.

This alternative would place an economic hardship on the permittee in the form of 3,621 AUMs of lost forage/grazing opportunities and associated loss of personal business income. It is likely that the permittee could not transfer this lost grazing use to other BLM allotments, as there currently are no other allotments in the Lakeview Resource Area that are vacant or have that amount of unallocated, (but available) forage. Thus, the permittee would have to: 1) graze his private lands more heavily (resulting in ecological stress to those private lands or loss of winter forage for his entire herd), 2) feed hay or rent other private land forage at a significant additional cost to his operation, or 3) sell part of his herd.

This alternative was eliminated from detailed study because it does not meet the CEQ definition of a “reasonable alternative”, it would not be consistent with the land use plan, would place an undue economic hardship upon the permittee, and would not meet the proposal’s stated purpose and need.

Alternative 11 – Horseshoe Meadow Riparian Exclosure

This alternative would consist of constructing a new exclosure fence around the entire Horseshoe Meadow area within the Horseshoe Pasture. The exclosure would encompass about 50-60 acres, including the small, existing exclosure at Horseshoe Spring. The fence would consist of a four strand barb wire fence with a smooth bottom wire.

This alternative was eliminated from detailed study because it would not eliminate late season cattle drift into the Horseshoe Pasture from adjacent pastures; nor would it meet the purpose and need of providing for an effective rest-rotation grazing system in the northern pastures. In addition, cattle would still tend to congregate around the outside of the exclosure in late summer and push on the fence to get at the greener, more palatable forage inside (when the adjacent upland forage has dried out and is less palatable). Thus, this fence would require frequent maintenance to prevent livestock movement into the riparian area.

Alternative 12 – Continuation of Interim Grazing Management Strategy

To comply with the grazing regulations, an interim livestock grazing management strategy was implemented in 2005 while a permanent solution could be developed and an EA completed. This strategy is described in more detail in the livestock grazing management section of Chapter III – Affected Environment. Under the interim grazing strategy, the Horseshoe Pasture has been rested every other year. On the years the Horseshoe Pasture has been grazed, use has occurred early in the growing season. Cattle were removed by early summer to allow the Horseshoe Meadow opportunity for plant regrowth. In rest years, grazing use was shifted to the southern portion of the allotment. Implementing this interim strategy as a permanent solution was considered, but eliminated from detailed study as a separate alternative because the impacts would be very similar to those described for Alternative 5 – Increased Herding.

CHAPTER III - AFFECTED ENVIRONMENT

GENERAL ENVIRONMENTAL SETTINGS

The affected environment within the Juniper Mountain Allotment is described as part of the broader landscape of the Lakeview Resource Area within the *Lakeview Proposed Resource Management Plan and Final Environmental Impact Statement* (RMP/Final EIS; BLM 2003a). The majority of that description is incorporated by reference and will not be repeated here. However, a summary of the resource values most likely to be affected by the alternative actions is included in the following section.

The Juniper Mountain Allotment (#0515) is located approximately 70 miles northeast of Lakeview, Oregon. Land status within the allotment is 84,862 acres of public land and 5,252 acres of privately owned land.

In August of 2001, the Juniper Fire burned approximately 4,565 acres in this allotment, specifically on the north and east slopes of Juniper Mountain (Horseshoe, Radio Springs, and Big Juniper Pastures). As part of the rehabilitation activities, fences were constructed to protect the burn area from grazing and have been retained as permanent livestock/pasture management fences on the east side of Juniper Mountain. The majority of the burned area has recovered naturally with native grasses and forbs.

REGIONAL CLIMATE

The climate in the vicinity of the Juniper Mountain allotment is variable, but typical of the Northern Great Basin or high desert system. Mean annual precipitation ranges from 10-16 inches. Precipitation occurs mostly in the form of snow during December through March with spring rains common. The soil temperature regime is frigid. Mean annual air temperatures range from 40 to 43 degrees F. The frost-free time period is from 50 to 80 days. The period of optimum plant growth is from April through June.

HYDROLOGY AND WATER QUALITY

Water quality in the system is currently not listed as impaired by the State of Oregon and no water quality data exists for this drainage. The State of Oregon requires the maintenance of the biological integrity of spring fed, intermittent, non-fishbearing systems, such as Horseshoe Meadow, even if they do not contain any fish species or are not tributary to any fish habitat; this means that no actions proposed in these areas should have adverse effects on water quality (Steve Kirk, Oregon Department of Environmental Quality , Pers. Comm., February 22, 2010).

Horseshoe Meadow includes a Riparian Conservation Area associated with Horseshoe Spring and its associated stream channel, as directed and defined by the Lakeview BLM Resource Management Plan (BLM 2003b). In Riparian Conservation Areas, maintenance, protection, and restoration of aquatic processes and functions are emphasized (BLM 2003b), making water quality, water quantity, riparian resources, and aquatic resources in general, the emphasis in management activities in the area.

Uplands associated with the project area are in stable condition with few rills and erosion. The 2001 wildfire opened areas of dense Western juniper cover and has subsequently allowed establishment of more dense upland grass cover with large soil-holding root masses that has decreased the overall erosion risk in the burn area.

The RHA (BLM 2004c) found that Horseshoe Meadow area failed to meet riparian standard 2 and livestock use had contributed to this failure due to compaction, erosion, and headcuts (see Photo 4) at the site. Photo analysis through 2009 indicate these headcuts appear to be relatively stable, but may be at risk for movement should a future, high-flow event occur, such as an intense summer thunderstorm or a large rain-on-snow event, particularly following a drought period that results in less vigorous plant conditions. If these headcuts did expand or move upstream, the result would be adverse effects to the local water table and riparian vegetation, and an increase in erosion.

Water in the system is spring-fed and flow is dependent upon water production from the spring, which is largely dependent upon moisture received in the watershed above the spring. Water in the meadow downstream of the spring and pond is intermittent. The pond below Horseshoe Spring captures and stores water from the spring and is therefore thought to limit the amount of water that flows to areas downstream. Grazing in the Horseshoe Meadow area is also thought to be limiting the amount of water that is stored in the meadow, and therefore the amount of water in the meadow in the summer and fall. Kauffman *et al.* (2004) studied meadows in eastern Oregon with a long history of livestock grazing, where grazing had been excluded for the most recent 9-18 years, and compared the excluded areas to grazed areas. The study found approximately 50% more below ground biomass, significantly lower soil bulk density, higher soil pore space, and an approximate 13-fold increase in infiltration rates in dry meadows excluded from grazing. Kauffman *et al.* (2004) also estimated that saturated soils of the surface 10 cm of a single hectare of dry meadow excluded from grazing would contain 61,000 L more water than an equivalent grazed hectare. Therefore, without the pond below Horseshoe spring or grazing in Horseshoe Meadow it is logical to conclude that water would persist longer into the summer in areas downstream of Horseshoe Spring.

SOILS AND BIOTIC CRUSTS

The recent Rangeland Health Assessment (BLM 2004c) summarized soil surface factor (SSF) data for the allotment collected during the ecological site inventory (ESI) effort between 1992 and 1997. SSF ratings are used to document an erosion class rating and the potential susceptibility of soil to accelerated erosion. Sixty-two percent of the allotment was rated in the slight erosion condition class. Twenty-nine percent was rated in the moderate erosion class. Less than five percent was rated in the critical or severe erosion class. Those areas with a moderate or higher ranking indicate some active erosion or evidence of past erosion. Current grazing practices did not appear to be responsible for areas being placed in the moderate or higher erosion condition classes (BLM 2004c).

There are several soil complexes within the project areas of the various alternatives. These soil complexes are described below.

Two different soil types exist in the area of construction for the various alternatives (2A, 2B, 6, 7, 8, and 9) that include fencing on Juniper Mountain proper. Soils covering the majority of the ridge top (of Juniper Mountain) are very shallow to bedrock or to strongly developed claypan. The soils are well drained and have developed in

residuum. Soil permeability is moderate to the bedrock or claypan and slow or very slow in the claypan. The claypan contains about 40 to 60 percent clay and the surface layer contains about 20 to 27 percent clay. The other soils in this site are very shallow to hard bedrock and typically contain over 60 percent coarse fragments through the profile. The available water holding capacity is about 2 to 6 inches for the profile.

The other type of soil occurs along the toe slopes or side hills of Juniper Mountain and consists of moderately deep, well drained soils that formed in residuum and colluvium from basalt and welded tuff. There is a claypan layer ranging from 8 to 12 inches thick. Depths to hard bedrock ranges from 20 to 35 inches. The profile averages 35 to 60 percent rock fragments mainly as cobbles, and 35 to 60 percent clay. Soil permeability is slow. Shrink-swell potential is high. Wind erosion potential is slight and water erosion potentials moderate. The available water holding capacity is about 3 inches.

The majority of the additional fencing described under Alternative 8, would be constructed through the Raz-Braze Anawalt soil complex (1-12%). The soils within this complex are shallow in depth, with a claypan layer ranging from 10-12 inches thick. The elevation ranges from 4500 to 6000 feet for this soil complex. The water erosion potential is slight to moderate, and the wind erosion potential is slight. This soil complex is well drained, with a gravely, clayey texture.

There is little information from existing research regarding the relationship between livestock grazing and biotic crust cover specifically from the northern Great Basin. Research on crusts conducted outside of the northern Great Basin is not directly comparable due to the significant differences in crust species composition, overstory vegetation, soil types, and climate. This represents an issue for which there is “incomplete or unavailable information”. According to the CEQ’s NEPA regulations (40 CFR Part 1502.22), when an agency is evaluating impacts and there is incomplete or unavailable information, the agency must make clear that such information is lacking. Further, if the information “cannot be obtained because the cost of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include.... (1) a statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts....; (3) a summary of the existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant impacts... and (4) the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community...”. The DOI NEPA regulations state that these costs are not just monetary, but can also include “social costs, delays, opportunity costs, and non-fulfillment or non-timely fulfillment of statutory mandates” (43 CFR Part 46.125).

The BLM does not have a comprehensive survey of biotic crust data for the Juniper Mountain Allotment. The following discussion is a summary of the existing scientific information on crusts that is applicable to the project area.

Microbiotic crusts consist of lichens, mosses, green algae, fungi, cyanobacteria, and bacteria growing in a thin layer on or just below the soil surface. Found in the soil spaces between larger vascular plants, these crusts play a role in controlling soil erosion, filtering water, retaining soil moisture, and improving soil fertility (BLM 2003a). There are no BLM Special Status microbiotic plant species known to grow in the Lakeview Resource Area, nor are any suspected to occur here.

In 1995-1997, the Ecological Site Inventory was completed for the western portion of the allotment. Using criteria developed by Jane Belnap, the ESI crew developed a technique to estimate the lichen, cyanobacteria, and moss cover present. The ratings are a percentage of the total cover including rocks and open spaces, and represent baseline data of microbiotic groups. Of the 58 sites in the allotment where crust cover was collected, 61% contained cyanobacteria, lichen, and moss cover ranging from 1-5%; 25% contained cyanobacteria, lichen, and moss cover ranging from 5-10%; and about 7% contained cyanobacteria, lichen, and moss cover ranging from 11-20%. All plots contained some biotic crusts.

Some biotic crust monitoring work is on-going within and outside of the Civilian Conservation Corps (CCC) enclosure to the northeast of the allotment (Map 2; T30S, R24E, Sections 17 and 18). This enclosure was built by the CCC in 1938 and has been used periodically as a rangeland study site. The enclosure is 80 acres in size. No authorized livestock grazing has occurred since 1938. The same year the CCC enclosure was built; the south side was cleared of brush by hand and may have been burnt. The north side of the enclosure was left untouched.

Approximately one third of the enclosure burned during the 2001 wildfire. A fire ecologist has been monitoring plant and crust responses to wildfire inside and outside of the enclosure since that time. Four plots were established in 2002 inside and outside in the burned and unburned areas. The plots were visited in 2002, 2004, and 2006. The studies are on-going, but some general observations have been made (Joseph Wagner, Interagency Fire Ecologist, Lakeview BLM/Fremont-Winema National Forest, personal communication, June 2006):

- 1) Visually, the crusts appear to be severely affected by fire. Very little moss was observed in the burned area, both inside and outside of the enclosure.
- 2) The crusts in the unburned plot are highly associated with low sagebrush plants, but are fairly frequent in the interspaces. It is suspected that the more intense burning and longer duration of burning under the sagebrush is responsible for the higher mortality of mosses associated with the sagebrush plants.
- 3) During the 2006 visit, mosses were observed in most of the plots inside the burned area. The excluded burned area had small clumps of mosses (size of a dime or nickel). Outside of the enclosure, mosses were present, but were much smaller in size (about 1 cm).

At about the same time, the Lakeview BLM botanist set out permanent plots to look at the species composition of lichen and mosses. In general terms, more lichens were found within the enclosure and within the area that had not been burned or grazed. A few lichens were found outside of the enclosure in the unburned area. No lichens were found in the burned areas inside or outside of the enclosure.

Studies by Ponzetti (2000) and Ponzetti and McCune (2001) examined biotic soil crust cover and composition at locations in central and eastern Oregon in 1995. One of the sites examined was the CCC enclosure. The study compared species richness of microbiotic crusts inside and outside of several enclosures to provide a grazed-verses-ungrazed comparison. Results of the study found that all of the sites had between one and six more taxa inside the enclosures than in the grazed pastures, with the exception of the CCC enclosure, which had three more species in the grazed transect. Generally, total crust cover was inversely related to vascular plant cover, as there is a positive relationship of crust cover to available soil surfaces (BLM 2003a). Ponzetti and McCune (2001) found that the differences in crust cover and species composition between study sites were most strongly related to soil pH, electrical conductivity, and the relative calcium carbonate content of the soil. Soil chemistry and climate differences were a stronger factor affecting cover and species composition than livestock exclusion. However, the study found a lower cover of biotic crusts, lichens, and species richness in grazed areas. These are the only known studies that have specifically examined microbiotic crusts within the Northern Great Basin or the Lakeview Resource Area to date.

The preceding discussion on biotic crusts meets the requirements of the CEQ's NEPA regulations (40 CFR Part 1502.22). The existing information has been summarized. There is no other current relevant research or scientific findings for biotic crusts within the northern Great Basin nor is there a credible "theoretical approach" in existence for estimating impacts to crust cover from livestock grazing management activities. The process of obtaining such information (conducting new scientific study) is not a primary mission of the BLM and the cost of obtaining this type of information would, in the BLM's opinion, be exorbitant.

Even if such information currently existed and impacts to crust cover could be addressed with some certainty, biotic crusts have no management goals or objectives associated with them. The *Lakeview Resource Management Plan/Record of Decision* (BLM 2003b) does not identify any specific management direction for biotic crusts other than acknowledging there is a need to promote "research into the role and functioning of microbiotic crusts in the northern Great Basin" (page 39).

Finally, the time needed to complete such studies would cause further delay in implementing a permanent solution to the rangeland health problem and further prevent the BLM from fulfilling its statutory mandate to make changes to grazing management in accordance with 43 CFR Part 4180.12(c). For these reasons, the potential impacts of livestock grazing management on crust cover will not be addressed further within this EA.

VEGETATION

Riparian Vegetation

Horseshoe Meadow is located on the west side of Juniper Mountain and contains the most extensive wet meadow area in the allotment (about 50 acres). The meadow area is directly associated with Horseshoe Spring, which has been impacted by past water developments. The associated drainage channel has had several reservoir/pits constructed within it to hold water for livestock use (Map 2). The RHA (BLM 2004c) determined that the Horseshoe Meadow was functioning at risk, was not meeting standard 2 (Riparian/Wetland Watershed Function), and that livestock was a causal factor.

In 2004, some riparian vegetation was noted around the spring area, intermixed with upland vegetation (BLM 2004c). Photos 1 and 2 show the riparian meadow vegetation lacked vigor and had weakened root systems in June of 2004. Photos 5 and 6 (2005) and 14 and 15 (2009) show that Kentucky bluegrass and yarrow are abundant downstream of the immediate spring area. Kentucky bluegrass increases rapidly on overgrazed pastures and ranges, and its presence is usually an indication of poor grazing management in the past (Uchytel 1993). Dominance of Kentucky bluegrass indicates prior disturbance such as heavy grazing or lowered water tables (Kovalchik 1987). Once established, Kentucky bluegrass is considered stable (Hansen *et al.* 1988) although rest can restore vigor and composition on at least some sites (Kovalchik 1987). The BLM does not have data to quantify changes in plant composition over the past six years, although some trend toward desirable, deep rooted native may be occurring with the recent improved livestock control in that time period. Based on photos from 2004-2009, vegetative ground cover does appear to be increasing in the meadow.

Because of its relatively shallow root system, Kentucky bluegrass is generally not as good a soil stabilizer as the native grasses and forbs it replaces. In riparian settings, it is ineffective in stabilizing streambanks. It is often associated with erosion and channel downcutting, especially where excessively grazed (Kovalchik 1987; Hansen *et al.* 1988; Uchytel 1993). Sedges and rushes are also present in the meadow and are thought to be largely responsible for the relative stability of the stream channel in recent years.

There are two existing headcuts in the drainage (see Photo 4). Photo analysis through 2009 indicates that these headcuts appear to have been relatively stable in recent years, but may be at risk for movement should a high-flow event occur, such as an intense summer thunderstorm or a large rain-on-snow event, particularly following a drought period that results in less vigorous plant conditions. Should these headcuts move or expand, they have the potential to lower the water table further and negatively affect existing riparian vegetation. Maintenance and/or improvement of the water table elevation coupled with proper grazing management are paramount to the improvement of riparian vegetation in the Horseshoe Meadow area.

The BLM ID team agrees that properly managed grazing can be allowed in the Horseshoe Meadow in the future, provided adequate rest occurs. The wet meadow area still retains the potential to recover annually and improve in vegetative condition over the long-term, if adequate rest is allowed and riparian plant regrowth can occur (see field notes from October 2006 site visit). Further, the monitoring photos taken in the Horseshoe Meadow since 2004 indicate that the riparian vegetation condition has improved somewhat under the interim management strategy.

Rangeland and Woodland Vegetation

Two sagebrush/grass vegetation types dominate the allotment. Low sagebrush/native grass mixes make up approximately 35% of the allotment. Big sagebrush/native grass mixes make up approximately 45% of the allotment. However, within the big sagebrush/grass vegetation type there is considerable variation, with basin big sagebrush/grass, mountain big sagebrush/grass, and Wyoming big sagebrush/grass present throughout the allotment. The variation in the herbaceous understory indicates that native vegetation communities appear stable (BLM 2004c). A summary of the ESI data (1992-1997) found that 71% of the vegetation in the allotment was in the early to mid-seral stage. Twenty-nine percent was in the late to climax stage. Overall, vegetation in the allotment is in excellent condition. Plant diversity is very high. Shrubs and grasses are in excellent condition (BLM 2004c).

The vegetation along the ridge line of Juniper Mountain consists of Western Juniper (*Juniperus occidentalis*), Idaho fescue (*Festuca idahoensis*), Bluebunch wheatgrass (*Pseudoroegneria spicata*), and low sagebrush (*Artemisia*

arbuscula). Vegetative composition is about 60 percent grasses, 10 percent forbs, and 30 percent shrubs and trees (Photos 2-5, 7, 9, and 11).

The top and northern, eastern, and southern aspects (side slopes) of Juniper Mountain prior to 2001 - during which approximately one half of the original stand was burned in a wildland fire - was occupied by a dense old growth western juniper woodland. The over-story tree canopy was 400 to 600 years old. A few trees within the stand were estimated to be near 1,000 years old (Miller, R., personal communication). Tree canopy cover ranged between 30 percent on the south aspect to 50 percent on the north aspect. Following the fire, the late to climax seral stage woodland vegetation in the burned area was pushed back to an early seral stage dominated primarily by native grasses and forbs. The western aspect of Juniper Mountain comprises a large portion of the Horseshoe Pasture. Vegetation in this pasture is primarily a sagebrush-grass community, with scattered young, invasive juniper (Photos 1-13). The 2001 wildfire did not impact the Horseshoe Pasture.

Cheatgrass (a non-native annual) occurrence across the allotment as a whole is minimal and it existed prior to the 2001 wildfire. Cheatgrass has the potential to spread or increase in dominance if the overstory cover is lost because of a major disturbance such as a wildfire (BLM 2004c). Several small pockets of cheatgrass along BLM Road 6185-0-00 in the Big Juniper and Radio Spring Pastures increased in size and site dominance immediately following the 2001 wildfire. Cheatgrass productivity seems to be related to slope aspect, elevation, and the local microclimatic conditions such as air and soil temperature and soil moisture (Bradley and Mustard 2005). Years with above average precipitation provide ideal conditions for cheatgrass establishment and growth in eastern Oregon (Ganskopp and Bedell 1979). West and Young (2000) also found warm, wet spring conditions ideal for cheatgrass. Field experience in the allotment has shown that when spring temperatures are cold and/or spring precipitation is low, cheatgrass does not germinate well. On sites where the soil moisture and temperature are ideal, cheatgrass germinates and grows very well.

For these reasons, the cheatgrass expansion observed immediately following the 2001 wildfire is most likely due to favorable site conditions rather than livestock grazing management practices. As the sagebrush component recovers following the wildfire, the amount of surface moisture available for cheatgrass germination in the spring should diminish, and the micro-climate will likely become less favorable for cheatgrass. As this happens, it is expected that the amount of cheatgrass at these sites will return to more historic, lower levels. This is consistent with conditions observed in Utah, where cheatgrass cover increased dramatically following fire (12.6% in 3-year old burns) and declined over time (to less than 1% in burns older than 22 years) (Barney and Frischknecht 1976). In central Oregon, cheatgrass biomass increased 4 to 6 fold (200 lbs/acre) in the first 2 years following western juniper removal by cutting (Vaitkus and Eddleman 1987). However, after 15 years, there were large increases in perennial grasses and a decline in cheatgrass to less than 10 lb/acre (Eddleman 2002). Bates *et al.* (2005) found similar results (spike in cheatgrass production) following a juniper treatment in the Steens Mountains to the east of the allotment. In that study, cheatgrass had a temporary spike in production 4-6 years after the treatment, which coincided with above average precipitation during this same period.

The *Lakeview RMP/ROD* (BLM 2003b) designated Juniper Mountain as an Area of Critical Environmental Concern and a Research Natural Area (ACEC/RNA). The values associated with the ACEC designation were botanical and ecological values related to old growth juniper and high plant species diversity. These values are described in more detail in the ACEC/RNA section of this document.

Cultural and Special Status Plants

Surveys for culturally important plants have been completed in the general project area. Several species have been found. Current livestock management does not appear to be detrimental to these plant species.

There are no Federally listed threatened or endangered species known to occur in the allotment. The only BLM special status plant species known to occur in the allotment are *Ivesia rhypara* var. *shellyi* and *Rorippa columbiae*. The *Ivesia rhypara* grows mostly on thin pumice or ash soils, and is located along the northern allotment boundary in Rehart Canyon. There have also been two surveys of potential habitat for *Rorippa columbiae* completed within the allotment. It is currently known to occur just north of the MC corrals in Foley Creek. This plant grows in moist areas along streams, ditches, lake shores, meadows, and playas (BLM *et al.* 1996).

Botanical surveys of the proposed ridgeline fence and cattle guard locations (Alternatives 2A, 2B, 6, 7, 8, and 9) have been completed and no special status plant species, including special status microbiotic species, were found. Botanical surveys of the proposed enclosure fence alignment (Alternatives 6 and 8) and the southern pasture fence alignments (Alternative 8) have not yet been completed.

Noxious Weeds

Bull thistle (*Cirsium vulgare*) has been treated in the past in the Horseshoe Meadow area. These scattered weed locations are monitored annually and treated as necessary, in accordance with an on-going, integrated weed management program (BLM 2004a). This monitoring and treatment would continue into the future regardless of the alternative selected for future implementation. Current noxious weed sites in the Lakeview Resource Area, including the Juniper Mountain Allotment area, are associated primarily with existing roads and drainages, which indicates that vehicle and water transport are more important methods of weed spread than are current livestock grazing management practices.

LIVESTOCK GRAZING MANAGEMENT

The active preference of AUM's within the allotment for cattle grazing is 3,651 AUM's (796 suspended) with a total preference of 4,447 AUM's. The allotment consists of 6 pastures of various sizes ranging from the largest pasture (Flint Hills) with 32,196 acres to the smallest pasture (Horseshoe) with 4,878 acres. The permitted season of use runs from March 16th thru October 31st. The current grazing system is managed as a rest-rotation grazing management system. Pastures which are grazed one year during an authorized timeframe are rested the following season or, at a minimum, not grazed the following season during the same time of year. At least one pasture receives a full year of rest each year.

The Juniper Allotment has a 50% (maximum) utilization standard defined in the *Lakeview Resource RMP/ROD* (Appendix E3, page A-148) and that standard would be common to all alternatives analyzed under this EA.

Prior to the construction of the Horseshoe Pasture Drift Fence (located on the northwest rim of Juniper Mountain), the Horseshoe Pasture was used as one pasture with the Big Juniper Pasture. The decision record for the Horseshoe Pasture Drift Fence was signed in 1998, following the completion of the EA (OR-010-98-03) (BLM 1998c). The fence was proposed to improve distribution, and control cattle drift in the Big Juniper Pasture (consisting of the current Horseshoe and Big Juniper Pastures) from drifting early and concentrating inside the Horseshoe drainage (while the remaining acres in the pasture receive light use). The drift fence created an additional pasture with the intent of maintaining or improving the riparian resources in the Horseshoe drainage. The Horseshoe Pasture Drift Fence (project # 5913) was constructed in 1999, and extends up the northwest portion of Juniper Mountain.

However, cattle still climb over the top of Juniper Mountain, around the end of the existing pasture fences, and end up in the Horseshoe Pasture due to the lack of solid pasture fencing (Map 2). This happens when cattle are grazing the Juniper Mountain and Radio Springs Pastures (and to a lesser degree, the Sagebrush Knoll Pasture). At the time the existing pasture fences were constructed, it was thought that the topography of the mountain slopes would serve as an effective barrier and cattle would not climb up the steep slopes and travel around the ends of the pasture fences. Livestock traveling over the mountain limits the ability to manage livestock grazing within the Horseshoe Pasture.

The Horseshoe Pasture was grazed in 2000 (from May 18 to June 8), in 2001 (from July 24 to August 6), in 2002 (from June 15 to November 30), and was rested in 2003. In 2004, grazing use was scheduled from April 26 to May 8. The rangeland health assessment was completed in September 2004.

Since the Horseshoe Meadow was found not to be meeting Rangeland Health Standard 2 (and livestock grazing was a causal factor) in 2004, the BLM was required to take appropriate action by the next grazing season to comply with the grazing regulations. An interim livestock grazing management strategy was implemented until such time a permanent solution could be developed and an EA completed. Under the interim grazing strategy, the Horseshoe Pasture has been rested every other year. On the years the Horseshoe Pasture has been grazed, use has occurred early in the growing season. Cattle were removed by early summer to allow the Horseshoe Meadow opportunity for regrowth after grazing occurred. This strategy operates smoothly if the Big Juniper and Radio Springs Pastures are

grazed at the same time the Horseshoe Pasture is being grazed, and rested when the Horseshoe Pasture is being rested. When grazing use is shifted to the southern portion of the allotment, it limits cattle drift over the top of Juniper Mountain.

The following is a summary of the grazing schedule since 2004. The BLM transferred all grazing use to the southern pastures of the allotment during the 2005 grazing season. The northern pastures, including the Horseshoe Pasture were rested in 2005. The grazing schedule for the 2006 grazing season included early spring grazing use in the Horseshoe Pasture. The Horseshoe Pasture was rested in 2007, and grazing use occurred in the Sagebrush Knoll and Eagle Butte Pastures. In early 2008, the Horseshoe Pasture was grazed along with the Big Juniper and Radio Springs Pastures. Cattle were moved into the Sagebrush Knoll Pasture for the rest of the 2008 grazing season. In 2009, water was anticipated to be the limiting factor. The Permittee turned out into the Flint Hills Pasture and stayed as long as the water lasted, which was the end of May. Cattle were moved through Eagle Butte to the Radio Springs Pasture, and then back to the Eagle Butte Pasture until the end of the grazing season. In 2010, cattle will stay in the Big Juniper Pasture as long as there is water, and then move to the Radio Springs Pasture. Cattle will be moved from the Radio Springs Pasture to the Sagebrush Knoll Pasture for the remainder of the grazing season. The Horseshoe Pasture will be used early by the cattle that drift over Juniper Mountain, while in the adjacent pastures.

Monitoring in the Juniper Mountain allotment has included compliance checks, utilization, photo and trend monitoring, and collecting actual use data. Compliance checks are conducted at various times throughout the grazing season to insure cattle are in the correct pastures during authorized time periods. Since 2004, compliance checks have focused mainly on the Horseshoe Pasture and are documented in the Juniper Mountain Allotment file. Compliance checks have been an important part of keeping cattle out of the Horseshoe Pasture during unauthorized periods.

Photo monitoring has been conducted on the Juniper Mountain Allotment as far back as 1974 (see Juniper Mountain Allotment Monitoring files 1-5). The last time most of the monitoring plots were reread was in 2009. Photo monitoring has occurred at various times in the Horseshoe Pasture since 2004. The photos focus mostly on the Horseshoe Meadow area of the Horseshoe Pasture. These photos have been taken from 2004 through 2009 and indicate that the Horseshoe Meadow area shows some signs of improvement (especially in vigor and ground cover) since 2004, and that the interim grazing strategy has had some success (Photos 1-12). The interim grazing strategy has only been partially successful in keeping cattle out of the Horseshoe Pasture during unauthorized periods. The interim strategy has required a high amount of BLM administrative time to conduct compliance checks, as well as increased the permittee's time and costs spent removing unauthorized cattle from of the Horseshoe Pasture. This effort has not been completely successful in keeping cattle out of the Horseshoe Pasture during periods of scheduled rest. Unauthorized livestock drift still occurs each year (as documented by memos in the allotment file), and will likely continue in the future until a permanent solution is reached.

A total of 74 developed water sources for stock water exist within the allotment including numerous playa waterholes and small reservoirs dispersed across the allotment which are completely dependent upon surface runoff of seasonal moisture (Map 2). Six perennial springs are also located within the allotment, all of them associated with Juniper Mountain itself. Several of these springs have been developed to provide reliable livestock water. All serve as additional stock watering locations. During extended drought years, stock water can be limiting in many of the pastures due to low winter/spring moisture. Some pastures lack sufficient stock water in poor moisture years and cannot be used. This has a corresponding effect on which pastures are used in a given year and how livestock are rotated around the allotment. During these times, pastures with adequate water sources may be used two or more years in a row, preferably at different times of the year (different seasons of use), for example: using the Sagebrush Knoll Pasture in early spring one year and using the same pasture the next season in late summer after seed set. This strategy ensures that plants are, at a minimum, given rest during the critical growing season every other year to allow for seed set and storage of adequate carbohydrate reserves for growth and maintenance of plant tissues.

Six springs associated with Juniper Mountain were found not to be meeting Rangeland Health Standard 2 in 2004 (two are located on private land) due to a lack of enclosure maintenance. Since that time, enclosure maintenance has been completed. Maintenance of these enclosures and other range improvement across the allotment is a common action occurring under each alternative analyzed in this EA, and is discussed further in the cumulative impacts section of this document.

WILDLIFE AND SPECIAL STATUS ANIMAL SPECIES

Big Game

The mule deer population that inhabits the Juniper Allotment and surrounding area is a typical example of a low elevation desert mule population found in eastern Oregon. Reliable surveys on such populations are difficult to produce and data that would reflect minor changes in population levels from year to year are not available for the Juniper Mountain area.

The pronghorn antelope population in the allotment and surrounding area appears to be healthy. Pronghorn populations are dependent on yearly spring fawn survival to remain at healthy numbers. Fluctuations in populations often vary year to year depending on factors affecting fawn survival including winter conditions and the current coyote population.

Mule deer and pronghorn antelope use the area year-round. Some fawning/kidding has been observed within the allotment. Rocky Mountain elk have been seen occasionally on Juniper Mountain; however, they spend most of their time on the National Forest and near Colvin Timbers to the south.

Other Common Wildlife

Migratory bird species use the Juniper Mountain Allotment for nesting, foraging, and resting during migration. No formal surveys have been conducted in the allotment and use is assumed to be consistent with other similar habitat within the Lakeview Resource Area. Species such as Brewer's sparrow, sage sparrow and loggerhead shrikes may inhabit portions of this allotment.

Numerous other animals common to the sagebrush-steppe and juniper woodland fringe occur within the allotment. Appendix H-2 of the Lakeview Proposed RMP/Final EIS (BLM 2003a) contains more information on typical Great Basin wildlife species assemblages that may occur in the allotment.

Special Status Wildlife

California bighorn sheep (BLM sensitive species) have occasionally been seen in the allotment with the majority of sheep habitat occurring along Abert Rim to the west.

Greater sage-grouse (BLM sensitive species) were recently determined by the USFWS to be warranted, but precluded from listing under the Endangered Species Act and are currently managed as a candidate species. This requires that any action which could negatively impact individual reproductive success should be carefully evaluated to avoid unnecessary negative impacts to the species. Within the current range of this bird, Oregon contains some of the best intact habitat that remains. Oregon has had a fluctuating, but stable sage-grouse population since 1973 (ODFW 2005).

Greater sage-grouse use the area year-round and broods are regularly observed within the allotment. Sage-grouse and their broods have been seen using all of the springs surrounding Juniper Mountain at certain times of the year. However, compared to other habitat in Oregon, population densities are relatively low. There are 8 sage-grouse strutting grounds (leks) located in the allotment. However, only 2 of the 8 leks are currently active (East Sagebrush Knoll #1 in the Sagebrush Knoll Pasture and Lynch Cow Camp in the Flint Hills Pasture). The active leks are located approximately 5 and 10 miles to the south of the Horseshoe Pasture (Map 7). The reasons that 6 of the 8 lek sites are currently inactive are unknown.

There is one active golden eagle nest located approximately 3.5 miles west of the south allotment boundary near Soup Lakes. This site is within the U.S. breeding seasonal home range as established by the U.S. Fish and Wildlife Service (2009). The nest is located at the top of a road cut along U.S. Highway 395. Although the nest is situated less than 25 feet from the roadway it continues to be successfully used by a pair of adult golden eagles. There is no long term nest data for this site. However, the nest produced a fledgling in at least 2 of the previous three years (G. Lorton, wildlife biologist, personal observation).

Pygmy rabbit (BLM sensitive species) populations are generally found in areas of dense big sagebrush (Orr 1940, Green and Flinders 1980b, Weiss and Verts 1984, Katzner and Parker 1997) with deep friable soils (Orr 1940, Janson 1946, Green and Flinders 1980b, Campbell *et al.* 1982, Weiss and Verts 1984, Himes and Drohan 2007) which are of sufficient depth to allow for suitable burrow production. Field inventory of potential suitable areas have been conducted within the allotment. The soil conditions present within the Horseshoe Pasture do not provide suitable habitat and no rabbits have been observed there. Habitat surveys have identified some pygmy rabbit habitat scattered across portions of the Radio Springs, Sagebrush Knoll, and Flint Hills Pastures to the east and south. (Map 7) (Foster 2003a; 2003b).

AREA OF CRITICAL ENVIRONMENTAL CONCERN/RESEARCH NATURAL AREA (ACEC/RNA)

About 6,335 acres surrounding Juniper Mountain was designated as both an ACEC and a RNA in 2003 (BLM 2003b). The ACEC/RNA contains a relatively isolated mountain (Juniper Mountain) rising to over 6,000 feet elevation. The Horseshoe Meadow is also located within the Juniper Mountain ACEC/RNA (Map 2) A detailed description of the existing relevant and important values that led to the ACEC designation is found in the *Lakeview Proposed RMP/Final EIS*, Appendix I - Areas of Critical Environmental Concern, pages A-201 thru A-203 (BLM 2003a). The following discussion is a brief summary.

Prior to 2003, most of the mountain was covered with western juniper woodland that was expanding into the surrounding sagebrush/grassland steppe of mountain big sagebrush and mixed perennial bunchgrasses. The northern, eastern, and southern aspects of Juniper Mountain were occupied by a dense, old-growth juniper woodland. This stand was truly unique in that: 1) it was the only old-growth woodland of both its size and tree density within the Klamath, High Desert, or Snake River Ecological Provinces, 2) tree canopy and density were considerably greater than the old-growth juniper woodlands occupying the Mazama Province, and 3) the woodland was growing on igneous derived soils rather than the aeolian sands that typify the old growth woodlands of the Mazama Province. The overstory tree canopy was 400 to 600 years old. A few trees within the stand were estimated to be near 1,000 years old (Dr. Rick Miller, personal communication). Tree canopy cover ranged between 30 percent on the south aspect to 50 percent on the north aspect. Although there was evidence of small fires throughout the woodland, a stand replacement burn had not occurred for at least 600 years. In 2001, a major wildfire burned approximately one half of the ACEC/RNA's stand of old-growth juniper trees.

The presence of the old-growth western juniper forest also contributed to the area being designated as a RNA. The Oregon Natural Heritage Plan (ONHP) determined that Juniper Mountain contained two (plant community) cells for the Basin and Range province (ONHP 2003):

- 1) Western juniper/big sagebrush/Idaho fescue
- 2) Western juniper/big sagebrush-bitterbrush steppe

Regarding the criteria for the RNA designation, "the old growth woodland on Juniper Mountain and adjacent shrub steppe communities provides an excellent outdoor research laboratory. It is an example of the successional endpoint (in the absence of major disturbance) for several mountain big sagebrush grassland communities common to the Intermountain Shrub Region. Currently, millions of acres of these shrub steppe communities are being encroached by western juniper within these ecological provinces. However, these stands are in various stages of woodland succession and less than 120 years old. The old-growth woodland on Juniper Mountain would allow researchers to study structure, function, and processes, which occur in climax juniper woodlands that have persisted for hundreds of years. Anthropogenic disturbance within both the woodland and adjacent shrub steppe communities has been minimal. Plant species composition within the western juniper woodlands and shrub steppe is in excellent condition throughout most of the area." (Dr. Rick Miller, personal communication, 1999, as stated in BLM 2000). The fourth criteria in the designation as an RNA was the high degree of biodiversity of plant species and plant communities. Despite the wildfire, one researcher felt the area still met the standards for a RNA because the other criteria that led to RNA designation were still present (Dr. Rick Miller, personal communication, 2004).

CULTURAL/HISTORIC RESOURCES

Cultural resource surveys have been completed in the area of the proposed fence and cattle guards under Alternative 2A, and 2B. No such resources were found along the proposed fence line or cattle guard locations. However, a

large lithic scatter was found at the spring and Horseshoe Meadow area within the Horseshoe Pasture.

A complete cultural resource survey of the Horseshoe Pasture or other pastures within the allotment has not been completed. The allotment does have a high potential for the occurrence of cultural resources. Sites such as rock cairns, rock art, lithic scatters, lithic quarry areas, occupation sites, stone rings and others have been recorded within the surrounding area.

SOCIOECONOMIC VALUES

The public lands within the Juniper Mountain Allotment are divided between Lake and Harney County with the County line dividing the allotment almost equally between the two. The *Lakeview Proposed RMP/Final EIS* (see Chapter 2, BLM 2003a) describes the general economic conditions in Lake and Harney Counties. The main economic base (livestock permittee) is located in Lake County, so the remainder of this discussion will focus on the economics of Lake County. Livestock production is a major component of Lake County's economy, providing 43% of total agricultural commodity sales (Oregon State University 1995). Gross farm/ranch sales in Lake County totaled \$41.8 million in 1998 (Oregon State University Extension Service 1999).

RECREATION OPPORTUNITIES

Though no recreational use data has been collected specifically from the allotment, staff observations indicate recreational use of the area is light or low. No developed recreation sites exist in the allotment. Several primitive "hunter camps" are located along major roads in the allotment. Known recreational activities tend to be dispersed across the area and may include hunting, wildlife observation, motorized sight-seeing, and dispersed camping and off-highway vehicle use associated directly with hunting. During development of the *Lakeview RMP/ROD* (BLM 2003b), all public lands within the Lakeview planning area, including the Juniper Mountain allotment, were classified into one of six recreation opportunity spectrum (ROS) classes (primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban). The ROS classification recognizes that the recreational resource base is not uniform across the planning area and varies in its potential to provide different types of recreational opportunities. These ROS classes are described and defined in more detail in Appendix M2 of the *Draft Lakeview RMP/EIS* (pages A-287 to A-288, BLM 2001). Table M2-1 (page A-291, BLM 2001) identifies and defines the criteria used in developing the ROS classification for the planning area (remoteness, size, evidence of human use, social setting, and managerial setting). The allotment falls mainly within the semi-primitive, motorized ROS class. Small portions in the southern part of the allotment along main roads are classified as roaded natural. The western edge (Highway 395 corridor) was placed in the rural ROS class. These 3 classes allow and even promote motorized recreation opportunities. Vehicle travel within the Juniper Mountain ACEC/RNA is limited to designated roads and trails. The remainder of the allotment is currently open to off-highway vehicle use (see Map R-9; BLM 2003b).

VISUAL QUALITY

The allotment is located within visual resource management (VRM) Class IV, the lowest of all scenic quality management classes (Map VRM-3, BLM 2003b). The objective of this class is to allow for management activities which may cause major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimizing disturbance, and designing projects to conform to the characteristic landscape (see Appendix M3, BLM 2001).

FUELS

Juniper that was once confined to rocky ridges and unproductive pumic sands with sparse vegetation and infrequent fires (Eddleman and Miller 1992; West 1984; Miller and Rose 1995; Miller *et al.* 1999a), has now spread to more productive sagebrush sites with deep, well-drained soils (Miller and Rose 1999). Juniper has also invaded the dry fringes of pine stands and aspen sites where it competes vigorously with other species (Wall *et al.* 2001; Miller and Rose 1999). Western juniper now occupies over one million hectares of eastern Oregon, southwestern Idaho, and northeastern California (Miller and Wigand 1994), including about 215,000 acres (7%) of the Lakeview Resource

Area (LRA). The proposed project area is currently in the Phase I stage of juniper encroachment with approximately 20-40 stems per acre and a fuel loading of approximately 0.80 tons to the acre (see Photo 13). The Rangeland Health Standards Assessment for the Big Juniper Mountain Allotment #515 states that the reduction of western juniper in the spring areas could help restore riparian-wetland function. Upland vegetation and western juniper compete with riparian vegetation for water and nutrients in the soil. Treating the upland vegetation in the riparian-wetland areas may aid in reducing competition for resources needed for recovery of riparian vegetation.

CHAPTER IV - ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

There are no areas identified by the BLM as WSAs, designated wilderness areas, other areas containing wilderness character, or wild and scenic rivers within the allotment (BLM 1980, BLM 1989, BLM 1991, BLM 2003a, BLM 2003b, BLM 2008b). There are no known hazardous waste areas, fish-bearing or perennial stream habitats, areas of religious concern, threatened or endangered species, special status plants, or prime or unique farmlands in the allotment. No significant or disproportionate impacts would occur to low income or minority populations. Neither adverse nor beneficial impact is anticipated to floodplains, air quality, land tenure, or mineral and energy resources from any of the alternatives analyzed in detail.

Potential impacts to hydrology and water quality, soils, range and woodland vegetation, riparian vegetation, cultural plants, noxious weeds, ACEC and RNA values, wildlife habitat, special status animals, livestock grazing management, cultural and historic resources, economic conditions, recreation, and visual quality are discussed in the following section.

ALTERNATIVE 1 - NO ACTION

Hydrology and Water Quality

Due to the inability to provide periods of rest in the Horseshoe Meadow under this alternative, the degraded hydrologic conditions (ie. “functioning at risk” rating) would continue into the foreseeable future or may even become even more degraded over time. Because livestock currently tend to drift into the meadow area from adjacent pastures, there would be less impact to upland sites in other pastures than at the meadow, but yearly use of the uplands on the west side of Juniper Mountain (with no rest or control) would continue to reduce ground cover on some upland areas adjacent to the meadow area. Decreased ground cover could result in increased erosion and soil loss with an associated loss of water holding capabilities. While extensive migration or expansion of the existing headcuts is not expected, they would not recover or stabilize. Under the right conditions (ie. severe thunderstorm), they could move upstream resulting in a lowered water table adjacent to the drainage.

Water quality in Horseshoe Meadow could continue to be negatively impacted due to the associated poor recovery expectations of the surrounding vegetation, soils, and channel conditions.

No additional impacts to hydrology and/or water quality would be expected in the remainder of the allotment because the existing grazing standards (50% utilization) would remain in place.

Soils

Under the No Action Alternative, soil erosion within the Horseshoe Meadow would continue and could increase over time. There would be no additional impacts or changes in current impacts to upland soils in the Horseshoe Pasture under this alternative, as no construction or other management changes would occur.

The impacts of continuing a rest-rotation grazing system throughout the remainder of the allotment have already been analyzed in the *Proposed Lakeview RMP/Final EIS* (BLM 2003a). In summary, livestock use would continue to negatively impact area soils due to compaction at waterholes and along trails (pages 4-35 to 4-36). However, a rest-rotation grazing system is designed to reduce these impacts. In addition, the upland vegetation in much of the allotment is in good condition, and would likely remain in a static condition, or experience an upward trend over

time. This would increase plant cover and root soil holding capacity, resulting in a net reduction in soil erosion potential across much of the allotment.

Vegetation

Riparian Vegetation

The vegetation in Horseshoe Meadow area would continue to be used season-long, every year, as livestock would continue to drift into the meadow from other adjacent pastures. This continued use (or lack of rest) would not allow for adequate regrowth of the riparian vegetation during the growing season, and would prevent natural recovery. Boyd and Svejcar (2004) found that late season clipping (vegetative removal) produced less riparian plant regrowth in southeastern Oregon than earlier season clipping. The Horseshoe Meadow area would probably continue to fail Rangeland Health Standard 2 into the foreseeable future due to the current grazing management practices.

Over time, sedges and rushes would continue to decrease in vigor, and would eventually likely be replaced with Kentucky bluegrass and other species less able to hold stream bank soils together. Season long use on riparian areas has been rated as the worst riparian grazing management option available (Platts 1991). While extensive migration or expansion of the headcuts is not expected, they would not recover or stabilize. If these headcuts did expand or move upstream, the resulting lowering of the water table adjacent to upstream portions of the drainage would have a negative impact on riparian vegetation.

Range and Woodland Vegetation

Though late season cattle use of the Horseshoe Pasture would continue due to livestock drift from adjacent pastures (Big Juniper, Radio Springs, and Sagebrush Knoll), there would not be much impact to the upland range (sagebrush) or woodland vegetation in the Horseshoe Pasture. Most of the late season cattle use would be concentrated on the small Horseshoe Meadow area within the pasture. Most of the upland vegetation in this pasture is in good condition and would retain a static or upward trend under this alternative. Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term, unless a wildfire occurred in the vicinity.

The impacts of continuing a rest-rotation grazing system throughout the remainder of the upland plant communities in the allotment have already been analyzed in the *Proposed Lakeview RMP/Final EIS* (BLM 2003a). In summary, the vegetation composition of key species is expected to improve over time under this type of grazing system (pages 4-6 and 4-9).

Cultural and Special Status Plants

Plant surveys conducted in the allotment have found only a few cultural plant species present. Depending on the time of year and longevity that the pasture is used, cultural plants in the Horseshoe Pasture could be negatively affected. Spring and early season grazing can have more impact on cultural plants than later in the year. This is not only because the plants themselves may be grazed, but the soils on these low sagebrush and meadow sites are more vulnerable to disturbance when wet. Since current management does not appear to be detrimental to existing cultural plant species, there would be no change or additional impacts expected to such species populations or habitat conditions in the Horseshoe Pasture or elsewhere in the allotment under this alternative.

The *Ivesia rhypara* population is located along the northern allotment boundary in Rehart Canyon. This plant grows on thin pumice or ash soils. This is an area of the allotment that cattle seldom visit, because of its long distance to water. Thus, the potential for cattle to impact this population by grazing or trampling this is low.

The *Rorippa columbiae* population is located just north of the MC corrals in the riparian zone of Foley Creek. A Conservation Strategy has been developed which recommends a number of management strategies to protect this species. Grazing and trampling by livestock is identified as a threat to local populations of this species as livestock tend to congregate in riparian zones (BLM *et al.* 1996). Under this alternative, this threat would continue into the foreseeable future.

Noxious Weeds

Bull thistle has been observed in the Horseshoe Meadow area. Thistle locations have been treated in the past and would continue to be monitored. Weed sites would continue to be inventoried, monitored, and treated as outlined in the *Lakeview Resource Area Integrated Weed Management Program* (BLM 2004a). Since existing management would not change under this alternative, the low level of risk of this weed species expanding or new species invading the pasture or elsewhere in the allotment would not change into the foreseeable future. The impacts of this on-going weed treatment program are described in detail in the previous weed treatment EA and will not be repeated here.

ACEC/RNA

There would be no impacts to the Juniper Mountain ACEC/RNA relevant and important values due to continuing current management practices. The values associated with the ACEC/RNA are tied directly to the presence of old-growth juniper stands and to the Heritage cells (plant communities) associated with these juniper stands. Approximately one-half of the of old growth juniper stands in the ACEC/RNA were killed in the 2001 wildfire. Though the remaining old-growth stands and associated plant communities (north, east, and south slopes of Juniper Mountain) could change in the future in response to natural causes such as drought, succession, or another wildfire, they would not change significantly due to continuing current livestock (rest-rotation) management within the surrounding allotment.

Specifically within the Horseshoe Meadow area (west slope of Juniper Mountain), the juniper-associated plant community cells do not exist; therefore there would be no impact to ACEC values. However, the RNA management goal that biodiverse plant communities remain healthy across the entire RNA may not be met specifically in the Horseshoe Meadow portion of the RNA under continuation of current management. At present there is a paucity of plant community variation and diversity in the Horseshoe Meadow area; this condition may be monitored in the future, but would not be expected to improve naturally under current management.

Wildlife and Special Status Animal Species

The current grazing system does not provide adequate rest for the improvement of riparian vegetation/habitat in the Horseshoe Pasture due to late season or season-long use. There would be some continued negative, long-term impacts to mule deer fawning habitat, pronghorn antelope foraging/kidding habitat, and other associated sagebrush-steppe wildlife species from continued cattle drift into the Horseshoe Pasture resulting in unauthorized late season use of the riparian area. There would be no impacts to elk, bighorn sheep, or golden eagle habitat specifically in the Horseshoe Pasture as these species do not use the pasture.

Some studies have found that sage-grouse and other birds can collide with fences by accidentally flying into them (Call and Maser 1985; Connelly *et al.* 2004). This issue seems to be most prevalent near active leks. Approximately 66.5 miles of fence currently exist within the allotment. Five of the six inactive leks are located within 0.5 miles or less of one of these existing fences (Map 7). The two active leks are located a mile or more from existing fences. For these reasons, the existing fences appear to have a minimal effect on the current (low-density) sage-grouse populations.

There would be some continued negative, long-term impacts to sage-grouse nesting/brood-rearing habitat within the Horseshoe Pasture under this alternative due to late season or season-long use by cattle. In addition, the Horseshoe Meadow and the surrounding upland area is currently being negatively impacted by the invasion of young juniper trees. These trees degrade sagebrush habitat for use by sage-grouse in all stages of their lifecycle. The impacts associated with the presence of juniper would increase over time as the trees age and increase in density on the landscape. Continuing management that allows unauthorized grazing use within the Horseshoe Pasture under this alternative would not be consistent with the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat #2a* (ODFW, 2005; page 75). However, continued grazing across the rest of allotment does conform to these guidelines, as the rest of the allotment meets rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75). Allowing a continued lack of adequate rest and juniper encroachment within the Horseshoe Meadow would not be consistent with the Endangered Species Act (ESA) management goals

for a candidate species (sage-grouse).

A survey of the Horseshoe Pasture did not locate any pygmy rabbit populations or suitable habitat. This alternative would not have any impact on this species specifically within the Horseshoe Pasture. Across the remainder of the allotment, livestock grazing could reduce or enhance habitat suitability for pygmy rabbits (Thimes *et al.* 2004), depending upon how it is done. Late spring grazing can increase the nutritional value of grasses and retard lignification (Clark *et al.* 2000; Wambolt *et al.* 1997; Van Soest 1994), however intensive grazing can reduce grass and forb composition (Laycock 1991; Bennett 1999). Grasses and forbs are important to pygmy rabbits during the spring and summer reproductive period.

Some research indicates that sagebrush obligate migratory bird species may be negatively affected by livestock grazing (Knick *et al.* 2003). However, continuing grazing under the current rest rotation system would not likely have significant adverse allotment or population level effects on migratory bird species.

Impacts of managing livestock grazing on wildlife and their habitat across the Juniper Mountain Allotment have already been addressed at the broader scale in the *Proposed Lakeview RMP/Final EIS* (BLM 2003a). In summary, these may include some negative impacts to upland wildlife species by altering forage, cover, and/or structure of habitats. However, these impacts can be reduced by adjusting the timing and duration of livestock use (p. 4-59 and 4-64). The current rest rotation grazing system is an example of such an adjustment in use that has been implemented to reduce wildlife impacts across the majority of the allotment. In addition, the implementation and maintenance of grazing systems in riparian and wetland habitats would be beneficial to special status animal species that utilize these areas (p. 4-72).

Cultural and Historic Resources

Though there is potential for cultural resources across the allotment, to date only a small portion of the 91,720-acre allotment has been surveyed. This represents an issue for which there is “incomplete or unavailable information”. The BLM’s obligations regarding incomplete or unavailable information are summarized in the Soils and Biotic Crust section of Chapter 3 and will not be repeated here. The existing resource information has been summarized in Chapter 3. There is no other current relevant research or scientific findings nor is there a credible “theoretical approach” in existence for estimating impacts to these potential resource values. The cost of obtaining this type of information (by conducting a complete survey of the allotment, estimated at \$28 per acre) would, in the BLM’s opinion be exorbitant (approximately \$2,568,160). In addition, the time needed to complete such studies would cause further delay in implementing a permanent solution to the rangeland health problem and further prevent the BLM from fulfilling its statutory mandate to make changes to grazing management in accordance with 43 CFR Part 4180.2(c). For these reasons, the potential impacts of livestock grazing management on site-specific cultural resources across the allotment generally cannot be fully evaluated. General impacts to cultural resources are described, to the extent possible, throughout this chapter.

Livestock grazing has the potential to cause trampling or disturbance to cultural resources located on or near the soil surface across the allotment. This potential impact would be highest in areas where livestock tend to congregate such as springs, drainages, ridge tops, and shady areas, if sites actually exist there. Livestock would continue to graze within a known archaeological site (lithic scatter) in the Horseshoe Meadow area and may cause some additional trampling damage to the site (which is located on the surface) due to “punching” of the wet, soft soils in the meadow. However, the level of trampling impact under this alternative would be maintaining the status quo (no increase or decrease from previous levels).

In general, the removal of vegetation by continued grazing could allow cultural materials on the surface of the ground to be more visible and potentially subject to illegal artifact collecting. However, the risk under this alternative would be maintaining the status quo.

Livestock Grazing Management

Under this alternative, the rest-rotation grazing system in place prior to 2005 would continue. Water availability would continue to be a driving factor determining which pastures are used and which are rested in a given year or season. The incomplete pasture division fences in the northern part of the allotment would continue to allow cattle

from adjacent pastures to drift into the Horseshoe Pasture resulting in unauthorized livestock use, and continued riparian impacts in the Horseshoe Meadow. This alternative would allow livestock grazing at currently authorized levels across the allotment as a whole, but it would result in continuing to fail to meet Rangeland Health Standard 2 in the Horseshoe Pasture.

This alternative would not provide a more effective or flexible rest-rotation grazing system in the northern pastures though the remainder of the allotment would likely continue to meet all five rangeland health standards into the foreseeable future. For these reasons, this alternative would not meet all of the objectives of the purpose and need for the proposed action.

Socioeconomic Values

Under this alternative there would be no changes to the socioeconomic conditions of the permittee or the Lake and Harney County economies.

Recreation

There would be no impacts or changes to existing recreation opportunities under this alternative.

Visual Resources

This alternative would not change the existing scenic quality of the allotment and would continue to meet the management objectives of VRM Class IV.

Fuels

The No Action Alternative would allow the small and relatively limited amount of post-settlement juniper that has encroached into the meadow area to increase over time. Due to the fact that juniper is a fire intolerant species; the continued encroachment of juniper due to fire exclusion would eventually turn the landscape from one of riparian meadow area to that of a juniper woodland. The change in stand structure would cause fire return intervals to decrease, yet the fires that occur in the future would likely be of greater intensity and involve more commitment of fire-fighting resources, time, and money to suppress. Fuel loads double as stands move from phase one to phase two juniper dominance and then double again between phases two and three. Fuel loads can increase as much as eight or more times what was present in the sagebrush ecosystem prior to tree encroachment (Chambers 2008).

ALTERNATIVE 2A – FENCING JUNIPER MOUNTAIN

Hydrology and Water Quality

The new fences would prevent cattle from drifting into the Horseshoe Pasture and allow for periodic rest of the entire pasture. Providing year-long rest periodically and modifying season of use on other years would allow riparian vegetation to regrow or recover, which is critical to stabilizing the site. As vegetation conditions improve and soils become less compacted, water from the spring should run longer into the year than current conditions allow. With improved cover over the channel and more moisture holding capability in the soils, water quality could improve slightly.

No additional impacts to hydrology and/or water quality would be expected in the remainder of the allotment because the existing grazing standards (50% utilization) would remain in place, similar to Alternative 1.

Soils

There would be some minor, short-term, site-specific effects to soils from fence construction in the project area, but there would be little lasting effects as the small, disturbed area (estimated at 1.2 acres of disturbance; 10 feet wide swath for the total of 5 miles of fence; 0.001 percent of the public acres within the allotment) would be expected to revegetate naturally within one or two growing seasons.

Cattle trailing along the proposed new fence line should be minimal since it would be constructed along ridge lines and side slopes in rough, rocky terrain that is typically not prone to cattle trailing use.

The proposed cattle guard locations represent sites that have previously been disturbed by road construction and vehicle travel. Construction in these disturbed areas would have little, if any additional impact on soils.

The vegetation in the remainder of the Juniper Mountain Allotment is in good condition, and would likely remain in a static condition, or experience an upward trend under this alternative. This would increase plant cover and root soil holding capacity, resulting in a reduction in soil erosion potential across much of the allotment, similar to Alternative 1.

Vegetation

Riparian Vegetation

Numerous studies have shown that controlled early spring season grazing can promote riparian recovery. Kruger (1983) found that in the spring cattle often avoid riparian zones because of colder temperatures, soil wetness, and forage immaturity. Spring grazing can encourage cattle to make more use of adjacent uplands where forage maturity and microclimate are more favorable (Platts 1984). Construction of the fence would prevent unauthorized late season grazing use and, therefore, allow for periodic rest and limited utilization (during years of authorized early season use) of the riparian vegetation. Regrowth of riparian vegetation is facilitated by the absence of summer grazing (Elmore and Kaufman 1993). Riparian vegetation should become more diverse and vigorous over time. Over the long-term, the riparian vegetation should expand to help stabilize the existing headcuts. Compaction from hoof action would be reduced and vegetation root masses would expand to form better soil and moisture holding capabilities. Soil moisture should extend or expand further downstream from the spring area and water flows should last longer into the summer. The patches of existing sedges should expand as the water table comes up. Thus, the riparian system as a whole in the Horseshoe Pasture would recover.

Rangeland management professors from Oregon State University who visited the site in October 2006 were in agreement that the proposed fence project would benefit the riparian area by allowing for an effective rest rotation grazing system that would provide rest years and allow adequate time for riparian vegetation regrowth during years with authorized spring grazing use (Notes of October 3, 2006 field trip).

Because this alternative is expected to lead to the recovery of hydrology, water quality, and riparian vegetation at Horseshoe Meadow, it is expected that it would lead to eventually meeting Rangeland Health Standard 2 in the Horseshoe Meadow portion of the Allotment.

Range and Woodland Vegetation

Up to 1.2 acres of existing vegetation directly along the proposed fence line would need to be trimmed or removed with chain saws to aid in fence construction, primarily in areas where the fence traverses stands of juniper. This would include trimming of live or felling of dead individual trees. The live old-growth juniper remaining following the 2001 wildfire is found primarily on the southern aspect of the mountain, is still intact, and would not be affected by the proposed fence except for minimal limbing of trees in the direct line of the fence. Most of the proposed fence would be located on the ridge top. The majority of the vegetation in this area is composed of bunchgrasses and low sagebrush which would be removed during fence construction. ATV travel along the fence line would also trample shorter vegetation such as grasses and sagebrush. Most of this disturbance would be short-term, occurring only during the construction phase. Many trampled or trimmed plants would recover over time. New plants would also resprout naturally in the disturbed area from existing seed sources. Thus, project construction would have little or no long-term effects on total vegetative cover or health in the pasture. Though upland vegetation in this pasture would benefit from the periodic rest provided by the proposed fence, most of the upland vegetation in this pasture is already in good condition and would retain a static or upward trend.

Cattle trailing along the proposed new fence line should be minimal since it would be constructed along ridge lines and side slopes in rough, rocky terrain, typically not prone to cattle trailing use.

The proposed cattle guard locations represent sites that have previously been disturbed by road construction and vehicle travel and are devoid of vegetation. Construction in these small disturbed areas would have no impact on upland vegetation.

Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term, unless a wildfire occurred in the vicinity similar to Alternative 1.

Cultural Plants and Special Status Plants

The cultural plant species that have been documented in the proposed fence construction area are few and are resilient to disturbance; these species should recover naturally or repopulate the small disturbed area over time from surrounding population seed sources. Impacts to cultural plants within the larger Horseshoe Pasture and across the remainder of the allotment would be similar to Alternative 1.

Botanical surveys of the proposed ridgeline fence and cattle guard locations for this alternative have been completed, and no special status plant species were found, including special status microbiotic species. Therefore, construction of the proposed project would have no effect on the special status plant species. The effects of continuing the rest-rotation grazing management system across the allotment would be the same as those described for Alternative 1.

Noxious Weeds

Bull thistle in the Horseshoe Meadow area has been treated in the past and would continue to be monitored. Although there are no noxious weeds present in the proposed fence location, project construction would disturb about 1.2 acres of native vegetation. Ground disturbance would increase the potential risk of weed spread and invasion. The standard weed prevention procedures outlined in the *Integrated Weed Management Program* (BLM 2004a) and the *Lakeview RMP/ROD*, Appendix D - Best Management Practices, Noxious Weed Management

section, page A-6 (BLM 2003b) would be followed during project implementation and would greatly reduce the potential for noxious weed invasion into the construction area.

The rest-rotation grazing system would improve the overall vigor and health of plant species in the Horseshoe Pasture. This would decrease noxious weed spread or the opportunities for them to become established.

ACEC/RNA

The ACEC/RNA values are tied to the existing old-growth juniper plant communities, the two RNA plant community cells, and the overall biodiversity of the plant communities. Though the proposed fence would require some limbing or possible felling of individual juniper trees to allow for fence construction, this would be limited to small, isolated areas (less than 1.2 acres) in the direct line of the proposed fence. This would not impact or alter the remaining (post-wildfire) old-growth stand characteristics or botanical values of the ACEC/RNA. The proposed cattle guards would be constructed in the road forming the western boundary of the ACEC/RNA and would, therefore, not have any impact on ACEC/RNA values. Monitoring may be needed in the future to determine if the management goal regarding maintaining healthy, biodiverse plant communities across the entire RNA, including the Horseshoe Meadow area, is met under this alternative.

Wildlife and Special Status Animal Species

Wildlife impacts from fence construction would be minimized by restricting site preparation for fence construction to the immediate area of the proposed fence. Impacts to mule deer and antelope passage would be minimized by constructing to BLM wildlife passage specifications (BLM 1985).

Mule deer, pronghorn antelope, sage-grouse, and other associated sagebrush-steppe wildlife species habitat in the Horseshoe Pasture would see some long-term benefits under this alternative. The proposed fence would provide needed rest from livestock grazing in the Horseshoe Pasture, especially during the late season when riparian vegetation is most vulnerable, and would allow some riparian meadow restoration, directly benefiting foraging

habitat for sage-grouse and their broods. The fence should also minimize trailing impacts through mule deer and pronghorn antelope fawning/kidding habitat which is limited in distribution within the allotment.

Though some studies suggest that sage-grouse and other birds can collide with fences by accidentally flying into them (Call and Maser 1985; Connelly *et al.* 2004), the proposed addition of five miles of fence built under this alternative is relatively low compared to the other fencing alternatives. Further, this fence is located several miles north of the nearest active lek (Map 7). For these reasons, fence related impacts to existing sage-grouse populations would be minimal under this alternative. The proposed fence and rest provided to the Horseshoe Meadow by the rest rotation grazing system would comply with conservation guidelines #4 (page 76) of the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (ODFW 2005) and with the ESA management goals for a candidate species (sage-grouse). Continued grazing across the remainder of the allotment under a rest rotation grazing system would also conform to these guidelines, as the majority of the allotment meets rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75).

However, young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term similar to Alternative 1, negatively affecting sagebrush-obligate and riparian-dependent wildlife habitats, including sage-grouse habitat. This component of the alternative would not be consistent with ESA management goals for a candidate species (sage-grouse).

There would be no impacts to elk, bighorn sheep, golden eagles, or pygmy rabbit habitat as these species do not routinely use the Horseshoe Pasture, nor would there be any changes in to habitats for these species across the remainder of the allotment compared to Alternative 1.

Some minor benefit to migratory bird species could occur due to improved habitat conditions in the pasture, but there would be no discernable allotment or population-level effects under this alternative.

Cultural and Historic Resources

The cultural resource survey did not find any cultural or historic resource values in the proposed fence line or cattle guard locations, therefore, no impacts would occur to such resources due to project construction.

The proposed fencing would eliminate unauthorized livestock trampling and wet soil “punching” within the site at the Horseshoe Meadow, but livestock trampling impacts during periods of authorized use would still occur.

The potential impacts of continuing livestock grazing across the remainder of the allotment (trampling and artifact collecting) would be similar to that described for Alternative 1.

Livestock Grazing Management

The proposed fence would provide an effective barrier to prevent cattle drift from adjacent pastures into the Horseshoe Pasture protecting the Horseshoe Meadow area from unauthorized, late-season grazing. In general, the Horseshoe Pasture would continue to be used in the early spring as part of the rest rotation system. This would provide grazing use ending early enough in the growing season to allow adequate regrowth of riparian vegetation. This regrowth of riparian vegetation is critical to the proper functioning of the Horseshoe Meadow area. The overall effectiveness of the rest rotation grazing management system would be improved, as all the pastures in the allotment would have adequate fencing to control livestock movement and prevent drift into adjacent pastures.

The proposed fence would provide additional flexibility to the livestock grazing management system across the allotment, especially in the case of drought. Though the Horseshoe Pasture would be used in the early spring most years, in the case of drought, the pasture could be used at other times (though not season long) during the summer (no more than once every 5 years), as long as it is followed by a year of rest. The remaining pastures could be used independently from one another, while improving the Horseshoe meadow, thus increasing flexibility across the allotment (especially in the northern pastures).

The design of the proposed fence was located on top of the ridge (of Juniper Mountain) because it is an area where

construction is feasible and it would be the most optimal or effective in controlling livestock movement. If the fence was built downslope from the ridgetop, cattle would have a tendency to climb over the mountain and drop down the slope until they hit the fence, where they would tend to congregate or walk the fence line. This could increase pressure on the fence, which would result in increased maintenance problems, and a decrease in its effectiveness as a barrier to livestock movement.

Installation of cattle guards would decrease the chance of gates being left open, cattle getting into the wrong pastures, and help to insure the Horseshoe Pasture is used only during authorized periods beneficial to the long-term health of the Horseshoe Meadow area.

Implementation of this alternative should result in improved riparian conditions in the Horseshoe Pasture. Riparian conditions would meet or make significant progress towards meeting Rangeland Health Standard 2. The alternative would allow for more effective implementation of a rest rotation grazing system in the northern pastures. This alternative would also allow continued livestock grazing at appropriate forage levels across the allotment as a whole. Thus, this alternative would meet all of the stated objectives of the purpose and need for the proposed action.

Socioeconomic Values

The proposed fencing is estimated to cost about \$40,000 to construct (5 miles of fence at \$8,000 per mile). The 2 cattle guards are estimated to cost \$6,000 (\$3,000 each). Most of this cost would be borne by the Federal government. Implementing this alternative would be of long-term economic value to both the permittee and the local economies. Implementation and continued livestock grazing at permitted levels would have similar positive effects on the Lake and Harney County economies as Alternative 1. This alternative would also be of benefit to the permittee because a properly constructed and maintained fence provides the greatest measure of control for cattle. The permittee would be responsible for all future fence maintenance costs. Although the permittee would have increased time and labor costs associated with additional fence maintenance across the allotment compared to Alternative 1, the benefits of the proposed fencing would likely exceed these additional costs. Implementation of this alternative would save the permittee from substantial costs associated with increased riding/herding (in Alternative 5) or potentially significant loss of income (under Alternatives 3, 4, 6, 7, and 8).

Recreation

There would be no direct impacts to recreation opportunities under this alternative. As the quality of the riparian area improves, it could improve both wildlife viewing and hunting opportunities within the Horseshoe Meadow area.

Visual

The construction of the fence and cattle guards under this alternative would meet or be consistent with the management objectives of VRM Class IV. The visual quality of the Horseshoe Meadow area would improve as the riparian vegetation becomes more diverse and vigorous. There would be no change in visual quality throughout the remainder of the allotment.

Fuels

This alternative would have the same impacts on fuel loading and fire return intervals as described for Alternative 1.

ALTERNATIVE 2B – FENCING JUNIPER MOUNTAIN AND RESTORATION ACTIVITIES

Hydrology and Water Quality

Impacts of this alternative due to fence construction, cattle guard installation, and continuing the rest rotation grazing system would be the same as Alternative 2A.

Periodic rest and the proposed juniper treatments should also allow upland areas in the pasture to be less susceptible to erosion, as ground cover increases with soil stabilizing grasses.

Proposed juniper treatments could make more water available to the Horseshoe Spring stream channel. A paired watershed study in central Oregon showed a positive response in water yield resulting from large scale juniper treatment (Deboodt 2007), and numerous juniper treatment projects have shown positive effects to hydrology, springs, seeps, and streamflow (Barrett 2005). Also, personal observation has shown that small scale (< 2 acres) juniper treatment can result in the expansion of adjacent springs as more water becomes available to the area.

Proposed headcut and checkdam work would serve to maintain and restore the water table in Horseshoe Meadow. Rest, coupled with the juniper treatment, and the headcut and checkdam work, would allow the Horseshoe Meadow and associated channel to recover over time. With improved condition, both the meadow system and adjacent uplands should move the watershed towards meeting the goal of capturing, storing, and releasing water longer into the year.

Headcut and checkdam work generally has a high rate of failure in some areas. The areas with the highest rates of failure are generally where stream channels are totally confined within gully walls and no floodplain exists. When high checkdams are placed in such settings, they normally washout (Swanson 1989) or the stream channel re-routes around them, creating excessive erosion. Conversely, when checkdams are designed and constructed appropriately, and are located in appropriate settings (i.e. high in the watershed) they can accelerate attainment of restoration objectives, such as the raising of local water tables and the establishment of riparian vegetation (Swanson 1989; Weinhold 2004). Weinhold (2004) found that out of 131 gully control structures installed in early 1960's, none had failed after over 40 years.

The headcut and/or checkdam work proposed under this alternative would only occur if monitoring shows that the stream channel has destabilized, in which case erosion would be occurring at an accelerated rate. If such were the case, the risk of accelerating erosion further would be minimal given the location high in the watershed, the relatively accessible floodplain available to dissipate energy, and the local expertise available that has resulted in the successful headcut restoration and checkdam construction.

This alternative would result in relatively rapid short term (<2 years) recovery of hydrologic conditions when compared to the other alternatives, due largely to the additional juniper and potential stream channel treatments. Although, in the long term (>10 years) the effects to hydrology and water quality may not be as beneficial as the removal of grazing proposed under Alternatives 6, 7, and 8.

No additional impacts to hydrology and/or water quality would be expected in the remainder of the allotment because the existing grazing standards (50% utilization) would remain in place, similar to Alternative 1.

Soils

The potential impacts of fence construction and cattle guard installation on soils in the Horseshoe Pasture would be the same as Alternative 2A. The periodic rest and juniper treatment in the Horseshoe Pasture should increase plant cover and root holding capacity, and lead to a reduction in soil erosion potential over time.

There would be short term soil disturbance from the construction work done to stabilize the headcuts. However, a long-term benefit would be expected as wet meadow vegetation expands, increasing soil holding capacities and ultimately decreasing soil erosion potential in the meadow area.

The vegetation in the remainder of the Juniper Mountain Allotment is in good condition, and would likely remain in a static condition, or experience an upward trend under this alternative. This would increase plant cover and root soil holding capacity, resulting in a reduction in soil erosion potential across much of the allotment, similar to Alternative 1.

Vegetation

Riparian Vegetation

The impacts from fence construction and the rest rotation grazing system on vegetation would be the same as

Alternative 2A.

Proposed juniper treatments could make more water available to the Horseshoe Spring stream channel. Proposed headcut and checkdam work would serve to maintain and restore the water table in Horseshoe Meadow. These actions would, in conjunction with regular rest from grazing at Horseshoe Meadow, promote the establishment of appropriate riparian vegetation.

This alternative would result in relatively rapid, short-term (<2 years) recovery and conservation of riparian vegetation, when compared to the other Alternatives analyzed in this EA, due largely to the proposed juniper and stream channel treatments. Although, in the long-term (>10 years) the effects to riparian vegetation may not be as beneficial as the removal of grazing proposed with Alternatives 6 and 7.

Range and Woodland Vegetation

Impacts during fence construction, cattle guard installation, and the rest rotation grazing management system on existing upland range and woodland vegetation would be the same as Alternative 2A.

Juniper treatment in the Horseshoe Meadow area would have positive effects on the adjacent upland sagebrush-grassland communities and no effect on mature juniper woodland communities elsewhere within the Horseshoe Pasture.

Headcut stabilization activities would have little or no effect on adjacent upland range or woodland vegetation.

Cultural and Special Status Plants

The impacts of fence and cattle guard construction on cultural plants would be the same as for Alternative 2A. The proposed restoration activities within the Horseshoe Meadow (reduction of juniper competition) could have a positive effect on cultural plants. The headcut stabilization activities would not impact cultural plants. Impacts to cultural plants from continuing a rest rotation grazing system across the allotment would be similar to Alternative 1.

Since no known special status species occur within the project construction zone, there would be no project-related impacts to special status plants. Impacts to special status plants due to continuing a rest rotation grazing system across the allotment would be similar to those described for Alternative 1.

Noxious Weeds

The impacts associated with fence construction, cattle guard installation, and rest-rotation grazing system on noxious weeds would be the same as for Alternative 2A.

Short-term soil-disturbing activities associated with head-cut stabilization could increase the potential risk of weed spread and invasion. In the long-term, the restoration activities would improve the overall vigor and health of plant species in the Horseshoe Meadow area. This would decrease the risk of noxious weed spread or the opportunities for new species to become established in the future.

ACEC/RNA

This alternative would have the same impacts to ACEC/RNA values from fence construction, cattle guard installation, and the rest rotation grazing system as described for Alternative 2A.

The proposed restoration activities would not impact or alter juniper old-growth stand characteristics within the ACEC/RNA and could improve the botanical values associated with the RNA by improving the plant community health, vigor, and diversity within the Horseshoe Meadow area over the long term.

Wildlife and Special Status Animal Species

This alternative would have the same impacts on wildlife, including special status species, from fence construction,

cattle guard installation, and the rest rotation grazing system as described for Alternative 2A for the Horseshoe Pasture.

However, additional benefits for wildlife and their habitat would be gained through the cutting of post-settlement (ie. invasive) juniper and the restoration of the meadow area through the stabilization of existing headcuts. Western juniper encroachment into sagebrush and meadow habitat degrades the habitat for use by sage-grouse and other sagebrush obligate species. As trees mature, shrub density declines as does the available water for riparian meadow plants. Important late brood rearing habitat would be lost over time in the meadow area and potential nesting habitat in the surrounding shrub community, if western juniper were not treated. Additionally, the headcuts in the meadow area has lowered the water table and had an adverse effect on the meadow plants used by sage-grouse. Under this alternative, the current loss of habitat to western juniper would be curtailed and overall the meadow conditions would improve for sage-grouse and other species that use riparian meadow habitats. Benefits to sage-grouse habitat would be higher compared to Alternative 2A. Actions taken to remove invasive juniper and stabilize headcuts would be consistent with the ESA management goals for a candidate species.

Some minor benefit to migratory bird species could occur due to improved conditions in the shrub component of the habitat within the Horseshoe Pasture, but there would be no discernable allotment or population-level effects under this alternative.

Cultural and Historic Resource

The impacts expected with fence construction and cattle guard installation would be similar to those identified with Alternative 2A.

The cutting of juniper would have no impacts to cultural resources, because trees would be cut and left in place with virtually no ground disturbance. The proposed juniper cutting would have no impact to “bow trees” because only invasive, non old-growth juniper trees would be cut.

The headcut stabilization activities would have no impact on the site within the Horseshoe Meadow.

The potential impacts of continuing livestock grazing across the remainder of the allotment (trampling and artifact collecting) would be similar to that described for Alternative 1.

Livestock Grazing Management

This alternative would have the same impacts from fence construction, cattle guard installation, and the improved rest rotation grazing system as described for Alternative 2A. This alternative would have the same flexibility during times of drought as described for Alternative 2A.

Restoration activities under this alternative would have little effect on livestock use or livestock grazing management. Restoration activities could slightly improve the forage condition and may slightly increase the abundance of herbaceous forage available for livestock in the meadow area compared to Alternatives 1 or 2A. However, there would be no change in forage allocation.

Implementation of the restoration activities should result in improved conditions in the wet meadow and the surrounding Horseshoe Pasture in the long-term. Riparian conditions would meet or would make significant progress towards meeting Rangeland Health Standard 2. Thus, this alternative would meet the stated purpose and need.

Socioeconomic Values

This alternative would have the same impacts from fence construction, cattle guard installation, and the rest rotation grazing system as Alternative 2A.

Restoration activities would be funded through the BLM programs, and would be at little or no cost to the permittee. Restoration activities would have little effect on other socioeconomic values.

Recreation

This alternative would have the same impacts on recreation opportunities as Alternative 2A.

Visual

This alternative would have the same impacts on visual quality as Alternative 2A.

Fuels

Under this alternative, approximately 50 acres of scattered, young, invasive juniper would be cut in and around the Horseshoe Meadow area in the Horseshoe Pasture. Due to the small amount of acreage treated, the effects on fire and net fuels reduction would seem minimal, but failing to treat the juniper would allow the riparian area to become an available source of fuel rather than an inhibitor which would have an effect on the areas available to hold or stop a future wildfire. The cost of treating the juniper at this time while the junipers are small and the stand density is low would be substantially less than trying to treat the stand after the area has become fully stocked with larger trees. Field reconnaissance of the proposed treatment area did not indicate the amount of juniper to be cut in the area would be abundant enough to warrant further treatment of the slash. Some increased wildfire risk would be incurred for two to three years following the treatment until the needles fell off the cut trees, but the risk would be minimal due to the size and spacing of the trees.

ALTERNATIVE 3 - REDUCED GRAZING LEVELS

Hydrology and Water Quality

Some improvement may be expected in hydrologic function as it relates to factors such as vegetative ground cover on upland areas in the Horseshoe Pasture. Livestock trails should show some vegetative recovery due to less total trailing use.

Because of livestock's natural tendency to concentrate on riparian areas later in the grazing season (BLM 1998a, Wyman 2006), the hydrologic function in the riparian area in Horseshoe Meadow would likely continue to decline. Even though total livestock use would be reduced by 50% across the entire allotment under this alternative, the lack of solid pasture barrier would still allow some livestock to drift into the Horseshoe Pasture from adjacent pastures during periods of scheduled rest. The negative effects of season long or late season use on drainage channels and head-cuts would be similar to, though perhaps somewhat less than Alternative 1. The total amount of impact would depend upon how many cattle actually trail into the meadow during the late-season each year. Water quality would continue to be affected negatively by the declining condition of the riparian vegetation surrounding the spring area. The Horseshoe Meadow would likely continue to fail Rangeland Health Standard 2 into the foreseeable future.

No additional impacts to hydrology and/or water quality would be expected in the remainder of the allotment because the existing grazing standards (50% utilization) would remain in place, similar to Alternative 1.

Soils

The impact of livestock hoof action and trampling on upland area soils would be lessened by approximately 50% within the Horseshoe Pasture and other portions of the allotment compared to all other alternatives. Soil erosion within the Horseshoe Meadow would continue due to the lack of a barrier and tendency of livestock to drift into the Horseshoe Pasture and concentrate in the Horseshoe Meadow area late in the season or all year long. The negative effects of this concentrated season long or late season use would be similar to, though perhaps somewhat less than Alternative 1 and would depend upon how many cattle actually trail into the meadow each year.

The vegetation in the remainder of the Juniper Mountain Allotment is in good condition, and would likely remain in a static condition, or experience an upward trend under this alternative. This would increase plant cover and root soil holding capacity, resulting in a reduction in soil erosion potential across much of the allotment, similar to

Alternative 1.

Vegetation

Riparian Vegetation

Because of livestock's natural tendency to concentrate on riparian areas, especially later in the grazing season when upland vegetation dries out and becomes less palatable, the riparian vegetation in Horseshoe Meadow would continue to decline. Even though total livestock use would be reduced by 50% under this alternative, the lack of solid pasture barrier would still allow some livestock to drift into the Horseshoe Pasture from adjacent pastures during periods of scheduled rest. The negative effects of this concentrated season long or late season use would be similar to Alternative 1.

Range and Woodland Vegetation

Impacts to upland range and woodland vegetation communities in the Horseshoe Pasture and other pastures within the allotment would be similar to, but approximately 50% less in magnitude than Alternative 1.

Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term, unless a wildfire occurred in the vicinity similar to Alternative 1.

Cultural and Special Status Plants

A 50% reduction in livestock use could benefit cultural plant species throughout the allotment by reducing potential grazing pressure and trampling effects. However, grazing use every year, even at reduced numbers would still allow some livestock to congregate in the Horseshoe Meadow area season-long, which could be detrimental to cultural plants in the Horseshoe Pasture in a manner similar to, or slightly less than Alternative 1.

Potential impacts to special status plant species across the allotment under this alternative would be similar to, or slightly less than those described for Alternative 1.

Noxious Weeds

Implementation of this alternative would have little or no effect on treatment of known sites under the on-going weed treatment program. Existing and newly discovered weed sites in the allotment would continue to be inventoried, monitored, and treated as outlined in the *Lakeview Resource Area Integrated Weed Management Program* (BLM 2004a). The risk of noxious weed spread or invasion due to continuing management of the allotment under a rest-rotation grazing system would be similar to Alternative 1.

ACEC/RNA

The impacts to the ACEC/RNA values would be similar in nature, but less than those described for Alternative 1. However, monitoring may be needed in the future to determine if the management goal regarding maintaining healthy, biodiverse plant communities across the entire RNA, including the Horseshoe Meadow area, can be met under this alternative.

Wildlife and Special Status Animal Species

The impacts of this alternative on wildlife and special status animal species habitat in the Horseshoe Pasture would be similar to, but slightly less than Alternative 1. A 50% reduction in grazing use each year would likely result in some increase in grass and forb forage species available for wildlife use across the allotment, including the Horseshoe Pasture.

Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term similar to Alternative 1, negatively affecting sagebrush-obligate and riparian-dependent wildlife habitats, including sage-grouse habitat.

Positive benefits to some special status species could occur, including sage-grouse. Decreased grazing could result in additional forage availability for sage-grouse chicks during the early brood rearing period which is critical for sage-grouse development. Since no additional fencing would be constructed under this alternative, the potential impacts associated with sage-grouse fence collisions would be similar to Alternative 1. This alternative would be consistent with conservation guidelines #4 of the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (ODFW 2005; page 76) provided the reduction in grazing allowed for sufficient recovery of riparian habitat within the pasture. Continued grazing across the remainder of the allotment under a rest rotation grazing system would also conform to these guidelines, as the majority of the allotment meets rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75). This alternative could be consistent with ESA management goals for a candidate species (sage-grouse) with regard to grazing. However, the lack of juniper treatment would eventually have a negative impact and would be inconsistent with the ESA management goals for sage-grouse in the long term.

A survey of the Horseshoe Pasture did not locate any pygmy rabbit populations or suitable habitat (Map 7). This alternative would not impact this species specifically within the Horseshoe Pasture. Potential impacts across the remainder of the allotment could include increased quality of forage for pygmy rabbits due to the reduction in grazing. Even if range land habitat improved under this alternative in the portions of the allotment currently occupied by pygmy rabbits, it is uncertain if any actual benefit to pygmy rabbit dietary health would occur. Thimes *et al.* (2004) noted that pygmy rabbits avoided grazed areas, but the effect of reduced grazing on pygmy rabbit populations in grazed areas has not been studied.

Some research indicates that sagebrush obligate bird species may benefit from removal or reduction of cattle grazing. For a more detailed discussion on the potential effects of livestock grazing on sagebrush habitats as it relates to avian species refer to Knick *et al.* (2003). Under this alternative, there would be no expected population level benefits to migratory bird species as the number of acres where grazing would be reduced is low compared to the amount of habitat available throughout the northern Great Basin. Relatively few additional nesting migratory bird species pairs would be expected to utilize the allotment for reproduction, resulting in no discernable effect on population levels.

Cultural and Historic Resources

Even though livestock grazing would be reduced by 50%, some livestock would still tend to congregate in the Horseshoe Spring and Meadow area due to the lack of a pasture division fence. This would allow trampling and wet soil “punching” of a known site. This impact would be similar to that described for Alternative 1, but may be of slightly less intensity.

The potential impacts of reduced livestock grazing across the remainder of the allotment would be similar to (trampling and artifact collecting), but of less intensity than (approximately half) that described for Alternative 1.

Livestock Grazing Management

The lack of a solid pasture boundary fence would still allow livestock to drift into the Horseshoe Pasture from three adjacent pastures during years or seasons when grazing is authorized in these adjacent pastures in a similar fashion as Alternative 1. Despite the 50% reduction in total livestock use, this continued unauthorized use of the Horseshoe Pasture would likely prevent adequate rest or long-term recovery of the riparian area. Implementation of this alternative would likely not meet or make significant progress towards meeting Rangeland Health Standard 2 in the Horseshoe Meadow area.

Under this alternative, distribution across the allotment as a whole would decrease. Even with a 50% reduction across the allotment, the rest rotation grazing system would still need to be followed to provide periods of rest and deferment for each pasture. However, this alternative would not provide a more effective or flexible rest-rotation grazing system in the northern pastures, though the remainder of the allotment would likely continue to meet all five rangeland health standards into the foreseeable future.

This alternative would not allow for livestock grazing at appropriate levels across the allotment as a whole in any given year.

For these reasons, this alternative would not meet all of the objectives of the purpose and need for the proposed action.

Socioeconomic Values

A permanent reduction of grazing levels by 50% within the Juniper Mountain Allotment would place extreme economic hardship on the permittee in the form of lost grazing opportunities and lost personal/business income. A 50% reduction of grazing privileges in the Juniper Mountain Allotment would be equal to a 38% reduction of the permittee's total active grazing privileges on all BLM lands. Presently, there are no additional AUMs available on other public lands where the BLM could transfer the 1,826 AUMs of lost grazing use. The availability of AUMs on private lands within Lake County is scarce. In addition, AUMs from private lands, even if available, would be substantially more costly to the permittee's operation than are AUMs from public lands. Currently the average price of an AUM on private, non-irrigated grazing lands within Lake County is \$12.00 to \$16.00 per month per cow/calf (Pete Schrader, Oregon State University Extension Service personal communication, 2008) compared to \$1.35 per AUM on BLM administered lands. The permittee would incur an additional \$19,447 to \$26,751 in costs per year to provide forage for his entire herd or would need to permanently reduce his herd. This herd reduction would result in less annual revenue generated by the permittee and would have an associated negative multiplier effect on the local economy.

Recreation

There would be no negative impacts to existing recreation opportunities across the allotment under this alternative. If the habitat quality of the riparian area improves within the Horseshoe Meadow, and upland habitats improve elsewhere in the allotment, it could improve both wildlife viewing and hunting opportunities to some extent.

Visual

This alternative would not change the existing scenic quality of the allotment and would meet the management objectives of VRM Class IV.

Fuels

The impacts to fuels under this alternative would be the same as for the No Action Alternative.

ALTERNATIVE 4 – FULL REST EVERY OTHER YEAR

Hydrology and Water Quality

Despite every other year rest provided under this alternative, cattle would likely continue to congregate in the Horseshoe Meadow area during use years. While an increase in ground cover and some riparian plant vigor would be restored during rest years, late season or season long use on the alternate years would likely negate the gains made. Use would be especially intense on the riparian area as stock move to the greener vegetation late in the summer. Therefore, the hydrologic components of the Horseshoe Pasture environment that allow the system to capture, store, and safely release water would likely continue to decline over time similar to Alternative 1.

There would be a gradual decline in overall watershed conditions. Over the long-term, the headcuts and eroding banks in the Horseshoe Meadow would likely expand in size similar to Alternative 1. Water quality would be affected negatively by the declining condition of the riparian vegetation in the spring area.

No additional impacts to hydrology and/or water quality would be expected in the remainder of the allotment because the existing grazing standards (50% utilization) would remain in place, similar to Alternative 1.

Soils

There are no range improvement projects proposed under this alternative. Therefore, soil disturbing activities would be less than under Alternatives 2A, 2B, 6, 7, 8, and 9.

The rest provided to soils in the Horseshoe Pasture should allow for a temporary increase in vigor of plant communities within the pasture with a corresponding increase in plant cover and root soil holding capacity, every other year. On grazed years, the impacts from livestock drift over Juniper Mountain would be similar to Alternative 1. The benefit to soils in the Horseshoe Pasture would be greater than Alternatives 1 and 3, but less than Alternative 2A or 2B.

The vegetation in the remainder of the Juniper Mountain Allotment is in good condition, and would likely remain in a static condition, or experience an upward trend under this alternative. This would increase plant cover and root soil holding capacity, resulting in a reduction in soil erosion potential similar to Alternative 1.

Vegetation

Riparian Vegetation

Despite every other year rest provided under this alternative, cattle would continue to congregate in the Horseshoe Meadow area during use years. Riparian vegetation would be reduced in vigor and total cover every other year. While some temporary gains would be made to riparian plant vigor in rest years (see Photos 5, 6, 9, and 10), they would be lost during late season or season long use in the grazed years (see Photos 1-3, 7, 8, 11, and 12). The meadow area likely would not meet or make significant progress towards meeting Rangeland Health Standard 2 over the long-term. These effects would be similar to, though slightly improved from Alternative 1.

Range and Woodland Vegetation

Impacts to upland range and woodland vegetation communities in the Horseshoe Pasture and the Juniper Mountain Allotment would be positive under this alternative. Plants would be provided with rest every other year, maintaining or improving the condition of the upland vegetation across the allotment.

Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term, unless a wildfire occurred in the vicinity similar to Alternative 1.

Cultural and Special Status Plants

The impacts to cultural plants within the Horseshoe Pasture would be similar to, or less than Alternative 1, but more than Alternatives 2A and 2B. The impacts to cultural plants across the rest of the allotment would be similar to Alternative 1.

The potential impact to special status plants across the allotment under this alternative would be similar to Alternative 1 during grazed years or less slightly less than Alternative 1 during rested years.

Noxious Weeds

Impacts to noxious weeds would be similar to Alternative 3.

ACEC/RNA

This alternative would have little impact on the ACEC/RNA values. However, monitoring may be needed in the future to determine if the management goal regarding maintaining healthy, biodiverse plant communities across the entire RNA, including the Horseshoe Meadow area, can be met under this alternative.

Wildlife and Special Status Animal Species

The impacts of this alternative to wildlife and special status species habitat in the Horseshoe Pasture would be similar to that of the Alternatives 1 and 3. Some livestock would continue to concentrate in the riparian areas every other year during the late season and which would not allow sufficient riparian habitat improvement. Habitat improvement made during every other year of rest would be temporary and would be lost during grazed years.

In addition, young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term similar to Alternative 1, negatively affecting sagebrush-obligate and riparian-dependent wildlife habitats, including sage-grouse habitat. Since no new fencing would be constructed, the potential impacts of sage-grouse fence collisions would be similar to Alternative 1.

This impacts of this alternative within the Horseshoe Pasture would likely not be consistent with conservation guidelines #2a(ii), 2a(iii), and 2a(v) of the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (ODFW 2005; page 75). However, continued grazing across the remainder of the allotment under a rest rotation grazing system would conform to these guidelines, as the majority of the allotment meets rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75). This alternative would not be consistent with the ESA management goals for a candidate species (sage-grouse) because of the continued grazing and juniper encroachment impacts within the Horseshoe Pasture.

There would be no impacts to elk, bighorn sheep, golden eagles, or pygmy rabbit habitat within the Horseshoe Pasture as these species do not routinely use the Horseshoe Pasture.

Some research indicates that sagebrush obligate migratory bird species may be negatively affected by livestock grazing (Knick *et al.* 2003). The impacts of removal of grazing every other year on migratory birds would likely be similar to Alternative 3.

Other impacts to wildlife, including special status species, in the remainder of the allotment would be substantially the same as described for the remainder of the allotment under Alternative 1.

Cultural/Historic Resources

The potential impacts to cultural resources within the Horseshoe Meadow would be similar to those where grazing is allowed (Alternatives 1, 2A, 2B, 6, 7, 8, and 9). However, the removal of grazing every other year would provide some benefits similar to those in Alternative 3. This alternative would reduce the total trampling and soil “punching” at the site in the Horseshoe Pasture, but would not completely eliminate it.

The potential impacts of livestock grazing across the remainder of the allotment would not occur during rest years, but would be similar to that described for Alternative 1 (trampling and artifact collecting) during grazed years.

Livestock Grazing Management

During rest years, the Horseshoe Meadow vegetation would recover and make progress towards meeting Rangeland Health Standard 2. However, during grazed years, cattle would drift over Juniper Mountain and congregate in the Horseshoe Meadow area similar to Alternative 1. This alternative would continue to allow the late season grazing of the Horseshoe Meadow. This late season use, every other year, would likely counteract any temporary riparian recovery made during a previous rest year. This alternative would not allow permanent attainment or substantial movement towards attainment of Rangeland Health Standard 2 over the long-term.

All pastures in the Juniper Mountain Allotment would be provided with rest every other year under this alternative. Periodic rest would maintain or improve the condition of the upland vegetation/forage across the allotment and would insure that the remainder of the allotment continues to meet rangeland health standards.

However, this alternative would not improve livestock grazing management flexibility in the northern pastures

during grazed years. Further, this alternative would only allow livestock to graze at appropriate forage levels across the allotment as a whole, every other year.

For these reasons, this alternative would not meet all of the objectives of the purpose and need for the proposed action.

Socioeconomic Values

This alternative would place extreme economic hardship on the permittee in the form of lost grazing opportunities and lost personal income every other year. On years that the Juniper Mountain Allotment was rested the permittee would have to find an additional 3,651 AUMs of forage for his herd during the time he would normally be grazing in the Juniper Mountain Allotment from March 16 to October 31. Presently, there are no additional AUMs available on other public lands where the BLM could transfer the 3,651 AUMs of lost grazing use. The availability of AUMs on private lands within Lake County is also scarce, especially on an every other year basis. In addition, AUMs from private lands, even if available, would be substantially more costly to the permittee's operation than are AUMs from public lands. Currently the average price of an AUM on private, non-irrigated grazing lands within Lake County is \$12.00 to \$16.00 per month per cow/calf (Pete Schrader, Oregon State University Extension Service personal communication, 2008) compared to \$1.35 per AUM on BLM administered lands. The permittee would incur an additional \$38,883 to \$53,487 costs every other year to provide forage for his entire herd. The likelihood of finding this additional forage on a permanent basis every other year is low, making the only other alternative for the permittee to permanently reduce his herd. This herd reduction would result in less annual revenue generated by the permittee and would have an associated negative multiplier effect on the local economy.

Recreation

The impacts to recreation opportunities under this alternative would be similar to Alternative 1.

Visual

This alternative would not change the existing scenic quality of the allotment and would meet the management objectives of VRM Class IV.

Fuels

The impacts to fuels under this alternative would be the same as the No Action Alternative 1.

ALTERNATIVE 5 – INCREASED HERDING/USE OF RIDERS

Introduction

The impacts of this alternative would depend largely on the effectiveness of herding in keeping livestock out of the Horseshoe Pasture during years or seasons of scheduled rest. Without solid pasture fencing forming a barrier to prevent livestock movement from other adjacent pastures, cattle would tend to move quickly back to known water sources/riparian zones in the Horseshoe Pasture after they have been moved out of the area. It is likely that daily or even more frequent herding would be required to keep cattle out of the Horseshoe Pasture and provide a minimally effective herding system (one that keeps cattle from congregating in the meadow for long periods of time).

Hydrology and Water Quality

If herding proves effective in keeping livestock out of the Horseshoe Pasture, such that rest and recovery of vegetation both on uplands and riparian areas occurs, then hydrologic components and water quality in the pasture could improve compared to Alternative 1. If herding is not effective, conditions within the meadow would decline similar to Alternative 1. As stock move back and forth between adjacent pastures, they would be expected to use established trails or create new trails. This increased trailing would negatively impact the watershed/hydrologic function due to increased erosion originating from the increase in trails.

No additional impacts to hydrology and/or water quality would be expected in the remainder of the allotment because the existing grazing standards (50% utilization) would remain in place, similar to Alternative 1.

Soils

If herding proves successful, cattle would not congregate in the meadow all season long. Soils would receive less compaction under this alternative than Alternatives 1, 3, 4, and 9. Under this alternative, soils could be provided with periodic rest, allowing for renewed vigor of plant communities within the Horseshoe Pasture. A corresponding increase in plant cover and root holding capacity would occur, followed by a reduction in soil erosion potential. Successful herding could have benefits similar to Alternatives 2A and 2B.

As stock move back and forth between adjacent pastures, they would be expected to use established trails or create new trails. This increased trailing would have a negative impact on soils due to increased erosion originating from the increase in trails. If herding was unsuccessful, or was not conducted frequently enough, impacts to the Horseshoe Meadow area would be similar to Alternative 1.

Soils impacts on the rest of the allotment would be the same as Alternative 1.

Vegetation

Riparian Vegetation

Livestock would be expected to seek out and concentrate in the Horseshoe Meadow area as they have in the past, at least for short periods of time. If herding proves effective in moving livestock out of the Horseshoe Pasture, such that they cannot concentrate in riparian areas for long periods of time, then the riparian areas would improve compared to Alternative 1. However, if herding is not effective, conditions within the meadow would likely decline similar to Alternative 1.

Range and Woodland Vegetation

The impacts to upland range and woodland vegetation in the Horseshoe Pasture under this alternative would be similar to Alternative 1. Increased trailing could slightly increase trampling effects on upland vegetation. Range and woodland vegetation on the rest of the allotment would be the same as Alternative 1.

Cultural and Special Status Plants

If riders were not successful in keeping cows out of the riparian area, impacts to cultural plants in the Horseshoe Pasture would be similar to Alternative 1 due to the tendency of livestock to concentrate there. If riders are successful in keeping cows out of the riparian area, the impacts would be more similar to Alternatives 2A and 2B. Impacts to cultural plants across the remainder of the allotment would be similar to Alternative 1.

Regardless of whether or not riders are effective in keeping cattle out of the Horseshoe Meadow, the potential impacts to special status plant species across the rest of the allotment under this alternative would be similar to those described for Alternative 1.

Noxious Weeds

Impacts to noxious weeds would be similar to Alternative 1 if herding is unsuccessful. If herding is successful, noxious weed impacts from livestock grazing under a rest-rotation system would be similar to those described for Alternatives 2A and 2B. There are no proposed fences under this alternative, limiting ground disturbing activities and lowering the risk of weed invasion into new areas across the allotment, compared to Alternatives 2A, 2B, 6, 7, 8 and 9.

ACEC/RNA

The potential impacts to ACEC/RNA values under this alternative would be similar to Alternative 1 if herding was not successful and similar to Alternatives 2A if herding was successful.

Wildlife and Special Status Animal Species

The impacts of this alternative on wildlife and special status species habitat in the Horseshoe Pasture would depend on the effectiveness of the herding program and the amount of riparian habitat recovery that actually results. If herding is effective in keeping livestock from concentrating in the riparian area for long periods of time, then the riparian habitat would improve and be of greater benefit to mule deer, pronghorn antelope, and sage-grouse compared to Alternative 1. However, if herding is not effective, riparian conditions within the meadow would decline and impacts to these wildlife species would be similar to Alternatives 1, 3, and 4.

Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term similar to Alternative 1, negatively affecting sagebrush-obligate and riparian-dependent wildlife habitats, including sage-grouse habitat. Allowing continued juniper encroachment would also not be consistent with the ESA management goals for a candidate species (sage-grouse). Since no additional fencing would be constructed under this alternative, the potential impacts associated with sage-grouse fence collisions would be avoided similar to Alternative 1.

If herding is successful in providing rest within the Horseshoe Meadow, this alternative would be consistent with conservation guidelines #2a(ii), 2a(iii), and 2a(v) of the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (ODFW 2005; page 75). However, if herding is not successful in providing rest, then this alternative would not be consistent with these guidelines nor would it be consistent with the ESA management goals for a candidate species (sage-grouse). Continued grazing across the remainder of the allotment under a rest rotation grazing system would conform to these guidelines, as the majority of the allotment meets rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75).

There would be no impacts to elk, bighorn sheep, golden eagles, or pygmy rabbit habitat within the Horseshoe Pasture as these species do not routinely use the Horseshoe Pasture.

Some research indicates that sagebrush obligate migratory bird species may be negatively affected by livestock grazing (Knick *et al.* 2003). However, continuing grazing under this alternative would not likely have significant adverse allotment or population level effects on migratory bird species.

Other impacts to wildlife, including special status species, in the remainder of the Juniper Mountain Allotment would be substantially the same as described under Alternative 1.

Cultural/Historic Resources

If herding is successful under this alternative, the potential impacts to cultural resources in the Horseshoe Meadow would be similar to 2A and 2B. If herding is unsuccessful in keeping livestock out of the Horseshoe Pasture, the amount of livestock trampling and soil “punching” of the site located in the Horseshoe Meadow would be similar to Alternative 1.

The potential impacts of livestock grazing across the remainder of the allotment (trampling and artifact collecting) would be similar to that described for Alternative 1.

Livestock Grazing Management

To stand the greatest chance of being effective, this alternative would require riders to be present at least during daylight hours, seven days a week, during the authorized season of use (March to October) to attempt to form a

barrier to cattle movement into the Horseshoe Pasture during scheduled periods of rest. (It is assumed that riding would not be practical after dark and some cattle could move back into the Horseshoe Pasture during this time).

This additional herding would be over and above that needed to move cattle into different pastures at different times during the rest rotation cycle. Riders would also need to patrol the Horseshoe Meadow area and push out any cows that got into the area. It is likely that daily or twice-daily herding of stock out from the Horseshoe Pasture would be required to be minimally effective.

The number of cattle that might make it into the meadow and need to be moved on a daily basis is difficult to estimate. During the 2006 grazing season, the BLM tested the potential effectiveness of this alternative by requiring the permittee to control unauthorized livestock use in the Horseshoe Pasture using additional herding (ie. the interim grazing strategy). The permittee attempted to increase his herding efforts with limited success. The BLM conducted compliance checks for unauthorized cattle use in the Horseshoe Pasture 2-3 times per month from June through August. Unauthorized cattle (from adjacent pastures where cattle were authorized to graze) were observed in the Horseshoe Pasture on every occasion, but one. After each sighting of unauthorized cattle, the permittee was notified to move the cattle.

The results of this interim herding effort described above casts serious doubt on the effectiveness of this alternative to keep livestock out of the Horseshoe Pasture for an adequate amount of time to allow for riparian recovery, if implemented on a permanent basis. Riders cannot completely prevent (ie. exclude) cattle from moving into the rested pasture with the same effectiveness as a properly constructed and maintained fence. Though the riparian area made some minimal improvement in 2006 compared to conditions in 2004 (see Photos 1-3, 7, and 8), it is unlikely that increased herding on a permanent basis would provide adequate rest and allow the Horseshoe Meadow to meet or make significant progress towards meeting of Rangeland Health Standard 2 over the long-term.

This alternative would not improve the flexibility of the rest-rotation grazing system in the northern pastures, though other pastures would continue to meet the rangeland health standards (similar to Alternative 1).

This alternative would allow for grazing at appropriate levels across the allotment as a whole.

For these reasons, the BLM does not find this alternative fully meets the objectives of the purpose and need for the proposed action.

Socioeconomic Values

Requiring the use of riders would place an increased economic burden upon the permittee during years when the Horseshoe Pasture is scheduled for rest and adjacent pastures are being grazed. The permittee provided the following estimate of the additional costs of herding cattle on a per trip basis (letter dated June 10, 2006).

Assuming 138 miles round trip distance from the base ranch location to the Horseshoe Pasture:

23 gallons of gas for stock truck at \$3.00/gallon= \$69.00/trip.
Maintenance of equipment (stock truck) = \$124.20/trip.
3 riders/cowboys a day at \$100.00 per rider/day = \$300.00.
Total costs per trip = \$493

In a typical grazing season, the permittee would turn out his cattle in early April and remove them from the allotment in late September or early October, depending on feed availability and water. To keep unauthorized cattle out of the Horseshoe Pasture during the scheduled grazing season of the surrounding pastures would, at a minimum require 5 months (June-October) and potentially 7 months (April-October) of riding on a daily basis. The total cost estimate for this level of increased herding would range from \$74,000 to \$103,500 per grazing season.

Recreation

The impacts to recreation opportunities under this alternative would be similar to Alternative 3.

Visual

The visual quality of the Horseshoe Meadow area could improve if herding is effective and the riparian vegetation becomes more diverse and vigorous. There would be no change in visual quality throughout the remainder of the allotment. This alternative would meet the management objectives of VRM Class IV.

Fuels

The impacts to fuels would be the same as Alternative 1.

ALTERNATIVE 6 – PERMANENT REMOVAL OF GRAZING IN THE EAST HALF OF THE HORSESHOE PASTURE

Hydrology and Water Quality

Hydrology and water quality conditions would improve over time with Alternative 6, as grazing related impacts would decrease in the most sensitive portion of the Horseshoe Pasture.

Kauffman *et al.* (2004) studied meadows in eastern Oregon with a long history of livestock grazing, where grazing had been excluded for the most recent 9-18 years, and compared the excluded areas to grazed areas. The study found approximately 50% more below ground biomass, significantly lower soil bulk density, higher soil pore space, and an approximate 13-fold increase in infiltration rates in dry meadows excluded from grazing. Kauffman *et al.* (2004) also estimated that saturated soils of the surface 10 cm of a single hectare of dry meadow excluded from grazing would contain 61,000 L more water than an equivalent grazed hectare. Similar effects would be expected at Horseshoe Meadow over the long term (<10 years) if excluded from grazing.

Erosion would decrease within the Horseshoe Meadow because upland and riparian vegetation become more abundant and vigorous. Compaction and erosion from hoof action would also be eliminated.

The existing headcuts may continue to move upstream and lower water tables over time, although by removing grazing impacts to the affected reaches, headcut movement may be slowed by the expected increase in riparian vegetation described below. Headcut recovery would be expected to occur more rapidly than with grazing, although not as fast as it would with active restoration of the sites.

In the long term, Alternatives 6 would result in the most benefit to the hydrology and water quality at Horseshoe Meadow as it would permanently rest the area from grazing and the grazing related impacts described above would decrease.

No additional impacts to hydrology and/or water quality would be expected in the remainder of the allotment because the existing grazing standards (50% utilization) would remain in place, similar to Alternative 1.

Soils

Under this alternative, impacts to soils during fence construction would be similar to Alternatives 2A and 2B; however, this alternative also includes an additional fence running parallel to BLM road 7155-A0. This additional fence (2 miles) would increase the amount of total soil disturbance compared to Alternatives 2A and 2B.

No soil compaction would occur, from livestock, in the east half of the Horseshoe Pasture. Soils would receive permanent rest, allowing for renewed vigor of plant communities within the enclosure. A corresponding increase in plant cover and root holding capacity would occur, followed by a reduction in soil erosion potential.

Trailing by livestock and associated soil disturbance or compaction (2-5 acres) could occur alongside the new fence lines over the long-term.

The west side of the Horseshoe pasture would remain open to grazing and managed under the rest rotation grazing system. The west side, and the remaining pastures in the Juniper Mountain Allotment, would be provided with periodic growing season rest as part of the rest rotation grazing management system, maintaining or increasing plant cover and root holding capacity, resulting in a reduction in soil erosion potential similar to Alternative 1.

Vegetation

Riparian Vegetation

Riparian vegetation conditions would improve over time with Alternative 6, as grazing related impacts would be removed in the Horseshoe Meadow. The removal of grazing is expected to result in the increased riparian vegetation abundance and vigor (compare Photos 1-3 with 4 and 5). The expected increase in water storage in the meadow (described above), coupled with the increase in riparian vegetation abundance and vigor, would result in long-term, beneficial effects to riparian vegetation at Horseshoe Meadow.

The existing headcuts may continue to move upstream and lower water tables over time, although by removing grazing impacts to the affected reaches, headcut movement may be slowed. Headcut recovery would be expected to occur more rapidly in the absence of grazing, but not as fast as it would with active restoration of the sites (under Alternative 2B).

Riparian vegetation should expand and become more vigorous over time and help stabilize the existing headcuts (see Photo 5). The expansion of riparian vegetation would increase soil moisture holding capabilities. Soil moisture should extend or expand further downstream from the spring area and water flows should last longer into the summer. The small patches of existing sedges should expand as the water table rises. Thus, the riparian system as a whole would recover over time under this passive restoration approach.

In the long term, Alternative 6 would result in the most benefit to riparian vegetation at Horseshoe Meadow as it would permanently rest the area from grazing. Because this alternative is expected to lead to the recovery of hydrology, water quality, and riparian vegetation, it would meet or make significant progress in meeting Rangeland Health Standard 2 in the Horseshoe Meadow portion of the allotment over the long-term.

No additional impacts to riparian vegetation would be expected in the remainder of the allotment as a result of the removal of grazing from the east half of the Horseshoe pasture (i.e. additional impacts due to overstocking or distribution issues) because the existing grazing standards (50% utilization) would remain in place for the remainder of the allotment.

Range and Woodland Vegetation

Impacts to upland vegetation from fence construction would be greater under this alternative than under Alternatives 1, 3, 4, 5, 9, and slightly (2 miles) greater than Alternatives 2A and 2B, and less than Alternative 8.

Impacts to upland vegetation would be similar to Alternatives 2A and 2B for the portions of the fence on the slopes of Juniper Mountain. Impacts would be slightly greater under this alternative because of the additional fence running parallel to BLM Road 7155-A0.

Though closing east half of the Horseshoe Pasture would benefit upland vegetation, most of the upland vegetation is already in good condition and would retain a static or upward trend.

The west side of the Horseshoe Pasture would remain under the rest rotation management system with the remainder of the Juniper Mountain Allotment. Most of the upland vegetation on the allotment is already in good condition and would retain a static or upward trend.

Cattle trailing along the proposed fence on Juniper Mountain should be minimal since it would be constructed along ridge lines and side slopes in rough, rocky terrain, typically not prone to cattle trailing use. Trailing by livestock and associated vegetation disturbance or compaction may occur along the west sides of the new fence line that is constructed parallel to BLM road 7155-A0 over the long-term.

Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term, unless a wildfire occurred in the vicinity similar to Alternative 1.

Cultural and Special Status Plants

Although there are few cultural plant species present in the east side of the Horseshoe Pasture, the species that are growing there would benefit from removal of grazing under this alternative. Impacts within the west half of the Horseshoe Pasture would generally be similar to Alternatives 2A or 2B. Impacts of continuing a rest rotation grazing system across the remainder of the allotment would be similar to Alternative 1.

Botanical surveys of the proposed ridgeline fence have been completed and no special status plant species were found, including special status microbiotic species. Though a botanical clearance has not been completed for the proposed enclosure fence line (parallel to BLM Road 7155-A0), this survey would be completed prior to fence construction and if any special status species was found, the fence would be realigned to include the site within the enclosure and avoid disturbance of the site. For these reasons, fence construction under this alternative would not have any impacts to special status plants. The effects of continuing a rest-rotation grazing management system across the remainder of the allotment would be similar to those described for Alternative 1.

Noxious Weeds

Bull thistle in the Horseshoe Meadow area has been treated in the past and would continue to be monitored. Although there are no known noxious weeds present in the proposed project location, project construction would disturb the native vegetation along the proposed fence lines. Any soil-disturbing activity increases the potential to introduce noxious weeds. Current infestations and any future noxious weeds discovered on the allotment would be treated using methods described in the *Lakeview Resource Area's Noxious Weed Management Program* (BLM 2004a). Mitigations for soil disturbing activities would be achieved by following appropriate best management practices described in Appendix D of the *Lakeview RMP/ROD* (2003), and the standard weed prevention procedures outlined in the *Integrated Weed Management Program* (BLM 2004a).

Implementation of this alternative would have little or no effect on treatment of known weed sites on the allotment under the on-going weed treatment program. The risk of noxious weed spread or invasion due to continuing management (rest rotation grazing system) of the west side of the Horseshoe Pasture, and the remaining pastures of the Juniper Mountain Allotment would be similar to Alternative 1.

Native vegetation would be provided with permanent rest on the east half of the Horseshoe Pasture which would improve the overall vigor and health of plant species in the enclosure, and would decrease the risk of noxious weed spread or the opportunities to become established.

ACEC/RNA

Under this alternative, the existing plant communities on the east side of the Horseshoe Pasture would be more stable and natural processes would improve due to the permanent removal of grazing. This alternative would have the greatest potential benefit compared to Alternatives 1, 2A, 2B, 3, 4, 5, or 9. Monitoring may be needed in the future to determine if the management goal regarding maintaining healthy, biodiverse plant communities across the entire RNA, including the Horseshoe Meadow area, is met under this alternative.

Wildlife and Special Status Animal Species

Wildlife impacts from fence construction would be minimized by restricting site preparation for fence construction to the immediate area of the proposed fence. Impacts to mule deer and antelope passage would be minimized by constructing to BLM wildlife passage specifications (BLM 1985).

Though some studies suggest that sage-grouse and other birds may collide with fences by accidentally flying into them (Call and Maser 1985; Connelly *et al.* 2004), the proposed addition of seven miles of fence built under this alternative is relatively low. Further, this fencing is located several miles north of the nearest active lek (Map 7).

For these reasons, fence related impacts to existing sage-grouse populations would be minimal under this alternative. The proposed fence and the rest provided by the change in grazing within the Horseshoe Pasture would be consistent with the conservation guidelines #4 of the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (ODFW 2005; page 76). Continued grazing within the rest of the allotment also conforms to these guidelines, as the majority of the allotment meets rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75).

Permanently removing cattle from the east portion of the Horseshoe Pasture, including Horseshoe Meadow, would have some benefit to sage-grouse as the riparian meadow conditions would improve. These benefits would be similar to those gained under Alternatives 2A, 3, or 4, but would likely improve more quickly than under these same alternatives. These benefits would be consistent with the ESA management goals for a candidate species (sage-grouse). However, young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands similar to Alternative 1, negatively affecting sagebrush-obligate and riparian-dependent wildlife habitats, including sage-grouse habitat. Allowing continued juniper encroachment under this alternative would not be consistent with the ESA management goals for sage-grouse.

Mule deer and pronghorn antelope occur within the Horseshoe Pasture. Permanent removal of cattle from the east half of the Horseshoe Pasture would have some benefit to these species as forage availability should increase. Gains in forage availability for these species should also occur under Alternatives 2A, 2B, 3 and 4, but likely to a greater extent under Alternative 6 as all competition from cattle would be permanently removed from the east half of the Horseshoe Pasture.

Some research indicates that sagebrush obligate bird species may benefit from removal of cattle grazing (Knick *et al.* 2003). Under this alternative, there would be no expected allotment or population level benefits to migratory bird species as the number of acres removed from grazing would be low and relatively few additional nesting pairs of migratory bird species would be expected to utilize the un-grazed area for reproduction.

A survey of the Horseshoe Pasture did not locate any pygmy rabbit populations or suitable habitat. This alternative would not impact this species or its habitat within the Horseshoe Pasture. There would be no impacts to golden eagles.

Other impacts to wildlife, including special status species, across the remainder of the allotment (outside of the east portion of the Horseshoe Pasture) would be similar to Alternative 1.

Cultural/Historic Resources

The construction of the fence on the ridgeline of Juniper Mountain would not impact cultural resources. The clearance for this fence was conducted, and no cultural resources were found. However, cultural clearances have not been conducted for the proposed fence line running parallel to BLM road 7155-A0. A cultural survey would be completed prior to construction of this proposed fence. The fence alignment would be adjusted to avoid (mitigate) any cultural resources located along the proposed fence line.

The potential impacts upon cultural resources in the east half of the Horseshoe Pasture (where livestock grazing would be removed) would be similar to Alternatives 7 and 8. This would eliminate potential trampling impacts at the Horseshoe Meadow site and reduce the risk of illegal artifact collecting.

The potential impacts of continuing livestock grazing across the remainder of the allotment (trampling and artifact collecting) would be similar to that described for Alternative 1.

Livestock Grazing Management

Under this alternative, the proposed fence would provide an effective barrier preventing cattle drift over the top of Juniper Mountain from adjacent pastures. Management within the Juniper Mountain, Radio Springs, and Sagebrush Knoll Pastures would be improved and there would be more flexibility available within the rest rotation grazing system (these pasture could be grazed outside dates conducive to the Horseshoe Meadow). The east half of the

Horseshoe Pasture would be fenced to keep cattle out of the Horseshoe Meadow area during the grazing season and would not be available for grazing during times of drought. This would result in adequate rest and meeting or making substantial progress toward meeting Rangeland Health Standard 2 over the long-term.

This alternative would allow livestock grazing at appropriate levels across the allotment as a whole, though total forage levels could be reduced slightly over the long-term. Excluding livestock grazing in the east half of the Horseshoe Pasture would remove approximately 1,300 acres from the total lands available for grazing within the allotment and the AUMs would initially be transferred to the other pastures. Monitoring data (trend, utilization, and actual use) would be collected and analyzed after a period of time (5-10 years) to determine long-term trend. If the trend was downward, the appropriate steps would be taken to remove AUMs from the active preference allocation, putting them under suspended AUMs (in accordance with 43 CFR 4110.3, 4110.3-2, and 4110.3-3). If the trend is stable or upward, the forage allocation would be retained.

Leaving the west half of the Horseshoe Pasture open to grazing could be beneficial when moving cattle from pasture to pasture within the allotment. The west half of the Horseshoe Pasture has a couple water sources and could operate as a small pasture; however, the water sources have a high possibility of drying up or not collecting enough water to support livestock use later in the season, or in a particular year. The west half would likely be used as a gathering/sorting pasture, or could be used in conjunction with the Big Juniper and/or Sagebrush Knoll Pastures.

The majority of the Juniper Mountain Allotment is in good condition, meets the rangeland health standards, and would likely remain so under this alternative.

For these reasons, this alternative would meet most of the objectives of the purpose and need for action.

Socioeconomic Values

The proposed fencing is estimated to cost approximately \$56,000 to construct (7 miles of fence at \$8,000 per mile). The permittee would have increased time and labor costs associated with additional fence maintenance under this alternative as compared to Alternatives 1, 3, 4, 5, and slightly (2 miles) more than Alternatives 2A and 2B. The proposed fence under this alternative would be an effective measure to control livestock use in the Horseshoe Meadow area, and would not require the money and time spent for herding under Alternative 5.

Initially this alternative would not result in any loss of AUMs or economic impacts to the permittee. However, this alternative has the potential to reduce the active preference on the allotment over the long-term (refer to the livestock management section above). A loss of AUMs on the allotment could result in a reduction in the number of cattle turned out, or the duration cattle are on the allotment. Either option would have an impact on the permittee's livestock operation. The permittee would have to sell cattle or find additional forage outside of the Juniper Mountain Allotment. A herd reduction would result in less annual revenue generated by the permittee and would have an associated negative multiplier effect on the local economy. Presently, there are no additional AUMs available on other public lands where the BLM could transfer this loss of AUMs to. The availability of AUMs on private lands within Lake County is also scarce. In addition, AUMs from private lands, even if available, would be substantially more costly to the permittee's operation than are AUMs from public lands. Currently the average price of an AUM on private, non-irrigated grazing lands within Lake County is \$12.00 to \$16.00 per month per cow/calf (Pete Schrader, Oregon State University Extension Service personal communication, 2008) compared to \$1.35 per AUM on BLM administered lands.

Recreation

The permanent removal of cattle from the east half of the Horseshoe Pasture would likely increase forage availability in that area for wildlife. Increased forage could improve wildlife observation and hunting opportunities if mule deer, pronghorn antelope, or other wildlife game species make more use of this area.

Visual

The visual quality of Horseshoe Meadow could improve if vegetation becomes more diverse and vigorous over time. There would be no change in visual quality throughout the remainder of the allotment. This alternative would meet

the management objectives of VRM Class IV.

Fuels

The impacts to fuels would be the same as Alternative 1.

ALTERNATIVE 7 - PERMANENT REMOVAL OF GRAZING IN HORSESHOE PASTURE

Hydrology and Water Quality

The benefits described for Alternative 6, would also be realized under Alternative 7, although they would be slightly more widespread, as more area would be excluded from grazing. The benefits of active restoration measures would be similar to Alternative 2B.

The removal of all non historic manmade structures, coupled with the removal of grazing, would restore the natural hydrology of the Horseshoe Meadow area to the fullest extent of any of the alternatives. Any erosion and subsequent deposition from the ground disturbance caused by the structure removal would be expected to be short term in nature (<2 years), as disturbed wet areas tend to re-vegetate and stabilize relatively quickly. Erosion control measures would further limit any erosion to minimal levels.

No additional impacts to hydrology and/or water quality would be expected in the remainder of the allotment, similar to Alternative 1, because the existing grazing standards (50% utilization) would remain in place.

Soils

Under this alternative, impacts to soils due to fence construction would be the same as Alternatives 2A and 2B. Restoration activities (juniper cutting, and head cut stabilization) would have the same impacts as alternative 2B.

No soil compaction would occur from livestock in the Horseshoe Pasture under this alternative. Soils would be provided with rest every year, allowing for renewed vigor of upland and riparian plant communities within the pasture. A corresponding increase in plant cover and root holding capacity would occur, followed by a reduction in soil erosion potential.

The initial restoration activities associated with reclaiming Horseshoe Spring, and all historic manmade structures would be ground disturbing. However, disturbed areas would be seeded to as part of the reclamation, and are expected to become stable over the long-term.

Vegetation

Riparian Vegetation

The benefits described for Alternative 6 would also be realized with Alternative 7, although they would be more widespread, as more acreage would be permanently excluded from grazing. The benefits of active restoration measures would be similar to Alternative 2B.

Because the removal of all non historic manmade structures would restore the natural hydrology of the Horseshoe meadow area to the fullest extent of any of the alternatives, and because the area would no longer be grazed, this alternative would restore natural riparian vegetation to the fullest extent of any of the alternatives. Erosion control measures would assist in the re-establishment of appropriate riparian vegetation.

No additional impacts to riparian vegetation would be expected associated with grazing across the remainder of the allotment because most other riparian areas within the allotment have already been excluded from grazing and the existing grazing standards (50% utilization) would remain in place, as described above.

Because this alternative is expected to lead to the recovery of hydrology, water quality, and riparian vegetation, it is

expected that it would meet or make substantial progress in meeting Rangeland Health Standard 2 in the Horseshoe Meadow portion of the Allotment over the long-term.

Range and Woodland Vegetation

Impacts from fence construction and livestock trailing would be the same as for Alternatives 2A and 2B.

Though closing Horseshoe Pasture would benefit upland vegetation in the pasture, most of the upland vegetation in the allotment is already in good condition and would retain a static or upward trend.

Restoration activities (juniper treatment in the Horseshoe Meadow, and head cut stabilization) under this alternative would have the same impacts as Alternative 2B.

Horseshoe Spring reclamation would have little effect on the uplands, because the spring is located in the meadow area. Reclamation of all non historic manmade structures (outside of the meadow area) would impact the uplands in the short-term, but would become stable over the long-term.

Cultural and Special Status Plants

The potential impacts to cultural plants under this alternative (due to fence construction and removal of grazing) would be similar to those described for Alternatives 2A and 6 specifically within the Horseshoe Pasture. The potential impacts to cultural plants due to continuing a rest rotation grazing system across the remainder of the allotment would be similar to Alternative 1.

Botanical surveys of the proposed ridgeline fence under this alternative have been completed and no special status plant species were found, including special status microbotic species. Therefore, construction of the proposed fence project and associated restoration activities would have no effect on the special status plant species, similar to Alternatives 2A, 2B, and 6. The effects of continuing a rest-rotation grazing management system across the remainder of the allotment would be the same as described for Alternative 1.

Noxious Weeds

Noxious weed treatment and monitoring would be the same as Alternative 6. Restoration activities (juniper cutting, and head cut stabilization) would have the same impacts as alternative 2B.

Implementation of this alternative would have little or no effect on treatment of known sites under the on-going weed treatment program. Native vegetation would be provided with rest every year in the Horseshoe Pasture. Rest would improve the overall vigor and health of plant species in the pasture, decreasing the opportunities for noxious weeds to become established in the future.

Locking the gates and closing all the roads within the Horseshoe Pasture would eliminate vehicle access. This would eliminate the opportunities for introduction or spread of new noxious weed by vehicles, one of the most common vectors of weed spread in the Lakeview Resource Area (BLM 2004a).

The reclamation of the Horseshoe Spring (or any soil-disturbing activity) increases the potential to introduce or favor the establishment of noxious weeds. The project area would be monitored for noxious weeds, and current infestations and any future noxious weeds discovered would be treated using methods described in the Lakeview Resource Area's Noxious Weed Management Program Environmental Assessment (EA No. OR-010-2004-03). Mitigations for soil disturbing activities would be achieved by following appropriate best management practices described in Appendix D of the Lakeview RMP/ROD (2003).

ACEC/RNA

The potential impacts to ACEC/RNA values would be similar to Alternative 6, and restoration activities described under Alternative 2B.

The proposed restoration activities would not impact or alter juniper old-growth stand characteristics within the ACEC/RNA and could improve the botanical values associated with the RNA by improving the plant community health, vigor, and diversity within the Horseshoe Meadow area over the long term. Removing non historic manmade structures would have short-term impacts to the plant community (directly beside the structures), but would have little effect on the majority of the plant community, and would have little or no long-term effects.

Wildlife and Special Status Animal Species

Except as noted, the benefits for sage-grouse in the allotment under Alternative 7 would be substantially similar to those gained under Alternatives 2A, 2B, 3, and 4. Under Alternative 7, the effects on big game species, migratory birds, special status species, and other wildlife in the Horseshoe Pasture would generally be the same or slightly greater in magnitude as those described under Alternatives 2B and 6.

Under this alternative, no additional fencing would be constructed, so the potential impacts of sage-grouse fence collisions would be avoided similar to Alternative 1. Removal of the spring enclosure fence could minimally benefit certain bird species such as sage-grouse. While some studies have documented fences as being problematic to some birds, there is no documented evidence that the small spring enclosure fence causes mortality to sage-grouse or other bird species. Removal of the enclosure fence would remove a potential collision hazard.

Removal of grazing with of the Horseshoe Pasture under this alternative would be consistent with the conservation guidelines #2a (ii), 2a (iii) and 2a (v) of the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (ODFW 2005; page 75) and would be consistent with the ESA management goals for candidate species (sage-grouse). Continued grazing across the remainder of the allotment under a rest rotation grazing system would also conform to these guidelines, as the rest of the allotment meets rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75).

The benefits of treating encroaching juniper in the meadow area would not be similar to those described for Alternative 2B and would be consistent with the ESA management goals for sage-grouse.

The removal of the spring development and associated trough could change the timing that water is available to wildlife. Water could be available for a shorter or longer period, but that cannot be determined with certainty at this time. Reduced water availability could negatively affect sage-grouse use of the area during the late summer and early fall when water sources are limited in the area. However, if the removal of the development promotes wet meadow conditions this would favor use of the area by sage-grouse during the period that these conditions persisted.

Removal of all man-made waterholes in the pasture could negatively affect several species of wildlife including pronghorn, mule deer and sage-grouse. To use an area as late brood rearing habitat, sage-grouse require an available water source. Habitat lacking an available water source is not suitable for late brood rearing of sage-grouse. Removal of all waterholes in the pasture could also potentially lead to a loss in reproductive potential for sage-grouse and individuals of other species currently relying on these sources. These species have become accustomed to use of these sources and would need to adjust their use of the habitat accordingly if these sources are removed. Removal of waterholes would likely result in a reduction of reproductive potential for sage-grouse and would not be consistent with the ESA management goals for candidate species (sage-grouse).

Cultural/Historic Resources

The construction of the proposed fence on the ridgeline of Juniper Mountain would not impact cultural resources. The clearance for this fence was conducted and no cultural resources were found.

Under this alternative, the potential impacts of trampling and removal of ground cover by livestock upon cultural resources within the entire Horseshoe Pasture would be eliminated. This would decrease the opportunities for illegal artifact collection within the pasture, because vegetation would not be removed and the erosion potential would be decreased.

The potential impacts of continuing livestock grazing across the remainder of the allotment (trampling and artifact

collecting) would be similar to that described for Alternative 1.

Removal of non historic manmade structures and the reclamation of Horseshoe Spring would have impacts to cultural resources if reclamation activities are conducted outside of the original area of disturbance. This would require recovery of cultural material outside the original area of disturbance. If activities are within the original area of disturbance, the reclamation activities would have no adverse impacts to cultural resources.

Livestock Grazing Management

Under this alternative, the proposed fence along the ridge top of Juniper Mountain would provide an effective barrier to prevent cattle drift from adjacent pastures into the Horseshoe Pasture and would protect the Horseshoe Meadow area from late season grazing. Permanent removal of grazing from the Horseshoe Pasture would result in meeting or making significant progress toward meeting Rangeland Health Standard 2 over the long-term.

Though the new fence would allow more flexibility within the grazing system within the adjacent Juniper Mountain, Sagebrush Knoll, and Radio Springs Pastures, closure of the Horseshoe Pasture would also negatively affect the ability to move cattle from pasture to pasture in the northern portion of the allotment. For example, cattle in the northwest portion of the Juniper Mountain Pasture would have to be moved around the east side of Juniper Mountain, instead of trailing through the Horseshoe Pasture to rotate to pastures in the south. Closing the Horseshoe Pasture would also remove several water sources in the northern portion of the allotment and remove a pasture from the current six-pasture rotation system. In addition, this pasture would not be available during times of drought.

This alternative would allow livestock grazing at appropriate levels across the allotment as a whole, though total forage levels would likely be reduced over the long-term. Excluding livestock grazing from the Horseshoe Pasture would remove approximately 4,880 acres from the total lands available for grazing within the allotment and the AUMs would initially be transferred to the other pastures. This would increase grazing pressure in the five remaining pastures in the allotment. This may result in areas of higher utilization. However, the existing 50% utilization standard defined in the Lakeview RMP/ROD (Appendix E3; page A-148) would remain in effect. Monitoring data (trend, utilization, and actual use) would be collected and analyzed after a period of time (5-10 years) to determine long-term trend. If trend was downward, the appropriate steps would be taken to remove AUMs from active preference, putting them under suspended AUMs (in accordance with 43 CFR 410.3, 4110.3-2, and 4113.3-3). If the trend is stable or upward, the forage allocation would be retained. The majority of the Juniper Mountain Allotment is in good condition and meets the rangeland health standards. It is unknown if it would remain so under this alternative.

Livestock grazing management would not be affected from the reclamation of the Horseshoe Spring or removal of non historic manmade structures because livestock grazing would be permanently removed from the Horseshoe Pasture under this alternative.

Locking the gates and closing all the roads within the Horseshoe Pasture would limit access to the general public. This could result in cut fences, increased fence maintenance costs, and make it more difficult to manage livestock and keep them in authorized pastures.

For these reasons, this alternative would not meet all of the objectives of the purpose and need for action.

Socioeconomic Values

The impacts would be the similar to Alternative 6, except the potential loss of AUMs over the long term would be greater under this alternative. This entire Horseshoe Pasture would be closed under this alternative. Therefore, it would have a larger impact on the permittee and the local economy than Alternatives 6 and 8.

Restoration activities would be funded through the BLM programs, and would be at no cost to the permittee. Restoration activities would have little effect on socioeconomic values.

Recreation

The permanent removal of cattle from the Horseshoe Pasture could improve opportunities for wildlife observation as forage availability should increase in that area. Improved forage could also benefit hunting opportunities if mule deer and pronghorn made more use of this area. Placement of pedestrian/equestrian passage in existing fences would provide access and improve opportunities for primitive, non-motorized recreational activities in the area.

Restoration activities would have little long-term effects to recreation, and would likely be similar to that described under Alternative 2B.

Visual

The visual quality of Horseshoe Pasture would improve as vegetation became more diverse and rigorous. This alternative would meet the management objectives of VRM Class IV.

The restoration activities (juniper cutting, and headcut stabilization) would have the same impacts as alternative 2B. The removal of all non historic manmade structures would have an effect on the visual quality in the short-term, but would improve in the long-term.

Fuels

The impacts to fuels would be the same as for Alternative 2B. Additional restoration activities would have little or no effect on fuels.

ALTERNATIVE 8 – HORSESHOE MEADOW CLOSURE/ADDITIONAL FENCING

Hydrology and Water Quality

The effects of Alternative 8 within the Horseshoe Pasture would be similar to those described for Alternative 6 because the same area would be excluded from grazing, although the benefits would not be realized to the same degree because the area would still be open to grazing in some limited instances.

The additional fencing would improve the ability to manage livestock across the remainder of the allotment. This would be expected to maintain or improve hydrology and water quality conditions in those pastures.

Soils

Impacts of the fencing on the side slopes of Juniper Mountain, and parallel to BLM Road 7155-A0, would have the same impacts as Alternative 6.

Soil compaction from livestock grazing would be greatly reduced in the east half of the Horseshoe Pasture, because of the indefinite closure. The indefinite closure would allow grazing to occur under certain conditions. Therefore, some compaction of soils from livestock grazing would still occur, but not to the intensity and frequency as Alternatives 1-5.

Soils would be provided with rest most years (except the 2 exceptions), allowing for renewed vigor of plant communities within the pasture. A corresponding increase in plant cover and root holding capacity would occur, followed by a reduction in soil erosion potential.

This alternative includes additional fencing outside the Horseshoe Pasture. The fence dividing the Sagebrush Knoll and Flint Hills Pastures is approximately 15 miles long, and the fence dividing the Eagle Butte Pasture is approximately 7 ½ miles long. Impacts from fence construction would be substantially greater under this alternative as compared to other alternatives.

Short-term soil compaction impacts may result from driving pickups, 4-wheelers, and/or tractors along the proposed

fence line during construction. Normal freeze-thaw action during the following would mitigate this impact, provided these routes do not become permanent following construction.

Trailing by livestock and associated soil disturbance or compaction may also occur along both sides of the new fence line(s) over the long-term.

Vegetation

Riparian Vegetation

Within the Horseshoe Meadow, the effects of Alternative 8 would be similar to those for Alternative 7 because the same area would be excluded from grazing. Some of the benefits described in the Alternative 6 discussion above would be realized with this alternative, although the benefits would not be realized to the same degree because the area would still be open to grazing in some instances.

Because this alternative is expected to lead to the recovery of hydrology, water quality, and riparian vegetation in the short-term, it is expected that it would meet or make substantial progress toward meeting Rangeland Health Standard 2 in the Horseshoe Meadow. Whether or not this meadow would continue to meet this standard over the long-term would depend upon how long or often it was grazed in the future.

The additional fencing in the southern pastures would have no effect on riparian vegetation conditions in those pastures because these riparian areas have already been excluded from grazing.

Range and Woodland Vegetation

Upland vegetation in the Horseshoe Pasture would be provided with rest most years (except for the 2 exceptions where grazing could be allowed in the future), allowing for the upland plant communities within the east half of the Horseshoe Pasture to complete their life cycles most years. Though closing the east half of the Horseshoe Pasture (indefinitely) would benefit upland vegetation, most of the vegetation is already in good condition and would retain a static or upward trend.

Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term, unless a wildfire occurred in the vicinity similar to Alternative 1.

This alternative would have the most ground disturbing impacts to upland vegetation from fence construction and livestock trailing across the allotment compared to all other alternatives over the long-term.

Cultural and Special Status Plants

The potential impacts to cultural plants within the Horseshoe Pasture under this alternative would be the same as described for Alternative 7. This alternative has the highest potential to directly impact cultural plants in the southern pastures of the allotment due to the construction of up to 22.5 miles of additional pasture division fencing. Though botanical surveys would be conducted prior to fence construction, there would be no attempt to realign these fences specifically to avoid cultural plants. Any plants within the proposed construction zone would be disturbed to some degree. However, these species are resilient to disturbance and should recover naturally or repopulate the disturbed area over time from surrounding population seed sources. The potential impacts to cultural plants due to continuing a rest rotation grazing system across most of the allotment would be similar to Alternative 1.

Botanical surveys of the proposed ridgeline fence under this alternative have been completed and no special status plant species were found, including special status microbial species. Therefore, construction of the proposed ridgeline fence project would have no effect on the special status plant species, similar to Alternatives 2A, 2B, 6, and 7. Though botanical clearances have not been completed for the proposed 22.5 miles of additional pasture fencing, these surveys would be completed prior to fence construction and if any special status species was found, the fence would be realigned to avoid disturbance of the site. For these reasons, fence construction under this alternative would not have any impacts to special status plants. The effects of continuing a rest-rotation grazing management system across the remainder of the allotment would be the same as described for Alternative 1.

Noxious Weeds

Implementation of this alternative would have little or no effect on the treatment of known sites on the allotment under the on-going weed treatment program (BLM 2004a).

Noxious weed treatment and monitoring impacts within the east half of the Horseshoe Pasture would be the same as described for Alternative 6. Native vegetation would be provided with rest most years in the east side of the Horseshoe Pasture. Rest would improve the overall vigor and health of plant species in the enclosure, and would decrease the risk of noxious weed spread or the opportunities for them to become established.

This alternative includes the largest amount of fencing, and would have the highest amount of ground disturbing activities from fence construction and livestock trailing across the remainder of the allotment. This would increase the risk of noxious weeds spread or the opportunities for them to become established.

ACEC/RNA

The impacts to ACEC/RNA values under this alternative would be the similar to Alternative 6 as long as grazing is not allowed. If grazing is permitted in the future, the impacts would be similar to Alternative 2A. Monitoring may be needed in the future to determine if the management goal regarding maintaining healthy, biodiverse plant communities across the entire RNA, including the Horseshoe Meadow area, can be met under this alternative.

Wildlife and Special Status Animal Species

Wildlife impacts associated with fence construction would be highest of any of the alternatives considered, but would be minimized, to the extent possible, by restricting site preparation for fence construction to the immediate area of the proposed fences. Impacts to mule deer and antelope passage would be minimized by constructing to BLM wildlife passage specifications (BLM 1985).

Some studies suggest that sage-grouse and other birds may collide with fences by accidentally flying into them (Call and Maser 1985; Connelly *et al.* 2004). The proposed addition of 29.5 miles of new fence under this alternative is relatively high. The proposed Sagebrush Knoll Pasture Division fence would come within a mile or less of 2 active and 4 inactive leks (Map 7). Though reflectors would be placed on any portions of this fence that fall within 0.5 miles of active leks to make the fence more visible and mitigate potential impacts to existing sage-grouse populations, this fence would not meet the sage-grouse guidelines (ODFW 2005; page 76) nor would it be consistent with ESA management goals for a candidate species (sage-grouse).

Under certain conditions, grazing could be allowed back into the east half of the Horseshoe Pasture under Alternative 8. Any future grazing would likely be infrequent or of short duration to meet specific goals or remedy emergency circumstances. Therefore, the effects to big game species, migratory birds, special status species, and other wildlife within the Horseshoe Pasture would be fairly similar to Alternative 6.

Benefits for sage-grouse in the east portion of the pasture under Alternative 8 are likely to similar in magnitude to those gained under Alternatives 2A, and 6, and could be less than Alternatives 2B and 7 (as no juniper removal is planned). Future grazing in this pasture under Alternative 8 would likely be consistent with the conservation guidelines #2a(ii), 2a(iii) and 2a(v) of the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (ODFW 2005; page 75) as long as additional grazing was infrequent. In addition, grazing the remainder of the allotment under a rest rotation grazing system would conform to these guidelines as the majority of the allotment meets the rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75). Allowing continued juniper encroachment in the meadow area would not be consistent with ESA management goals for sage-grouse.

Pygmy rabbit populations could be negatively affected by the proposed Sagebrush Knoll Pasture Division fence. This is the only fence that crosses pygmy rabbit habitat (Map 7). This impact would be limited to the potential destruction of a few burrows during fence construction activities.

Some research indicates that sagebrush obligate migratory bird species may be negatively affected by livestock grazing (Knick *et al.* 2003). However, continued grazing across the remainder of the allotment under a rest rotation system would not likely have significant adverse allotment or population level effects on migratory bird species.

Cultural/Historic Resources

The construction of the fence on the ridgeline of Juniper Mountain would not impact cultural resources. The clearance for this fence was conducted and no cultural resources were found. Clearances for the additional fence lines proposed in the southern pastures have not yet been conducted. Clearances would be conducted before fence construction occurred on the ground and if cultural resources were found the fence alignment(s) would be adjusted to avoid (mitigate) any potential effects. For this reason, fence construction activities would not impact cultural resources.

Initially, this alternative would have the same potential impacts to cultural resources in the Horseshoe Meadow as those described for Alternative 6 within the closure area. However, some trampling and soil “punching” would occur in the meadow area if grazing is authorized in the future.

The potential impacts of continuing livestock grazing across the remainder of the allotment (trampling and artifact collecting) would be similar to that described for Alternative 1.

Livestock Grazing Management

Initially, the effects of closing the east half the Horseshoe Pasture on livestock grazing management flexibility would be the same as those described under Alternative 6. However, this alternative would have more flexibility for grazing management in the future because the east half of the Horseshoe would not be closed permanently. The east half of the Horseshoe Pasture could be grazed occasionally for the following reasons: 1) to provide rest for other portions of the allotment in case of wildfire and drought, or 2) to reduce fuel loading.

Initially, this alternative would provide adequate rest for the Horseshoe Meadow and would meet or make substantial progress toward meeting Rangeland Health Standard 2 in the short-term. Whether or not this alternative would continue to meet this standard over the long-term would depend upon how long or often it was grazed in the future.

This alternative would allow livestock grazing at appropriate levels across the allotment as a whole, though total forage levels could be reduced slightly over the long-term. Excluding livestock from the east half of the Horseshoe Pasture would add grazing pressure to the rest of the allotment similar to Alternative 6. Changes in permanent forage allocation would be handled in a similar fashion as Alternative 6.

The additional southern pasture fences would be beneficial from a grazing management perspective because they would add pastures to the rest rotation grazing system. Increasing the number of pastures would increase flexibility in the allotment and possibly increase livestock distribution within each pasture, which could ensure that rangeland health standards continue to be met across the rest of the allotment. Water availability would still be a primary factor determining which pastures would be used in a given year.

For these reasons, this alternative would not meet all of the objectives of the purpose and need for action.

Socioeconomic Values

The economic impacts to the permittee from closing the east half of the Horseshoe Pasture would initially be similar to Alternative 6.

The costs associated with fencing and cattle guard are the highest of all alternative considered. The cost to fence the east half of the Horseshoe Pasture is approximately \$56,000 (7 miles of fence at \$8,000 per mile). The Sagebrush Knoll/Flint Hills Pasture Division fence would cost approximately \$120,000 (15 miles of fence at \$8,000 per mile). The Eagle Butte Pasture Division fence would cost approximately \$60,000 (7 ½ miles at \$8,000 per mile). The

estimated total fencing cost is \$236,000. The cattle guard at the south end of the Sagebrush Knoll fence would cost about \$4,000.

In addition to the initial cost of constructing these fences, there would be additional costs associated with fence maintenance in future years. The permittee would be responsible for future maintenance. This would include increased time and labor costs associated with additional fence maintenance across the allotment compared to all the other alternatives. If all the fences under this alternative were constructed, it would increase the number of pastures that could be used under a rest rotational grazing system by three; however, it would require additional permittee time spent trailing or rotating cattle between pastures.

Recreation

There would be no direct impacts or changes to existing recreation opportunities in the allotment under this alternative.

Visual

This alternative has the greatest potential to impact visual quality due to the large amount of new fence construction proposed. Building additional fence would have a negative impact the visual quality of the allotment. However, this alternative would meet the management objectives of VRM Class IV.

Fuels

The impacts to fuels would be the same as described for Alternative 1.

ALTERNATIVE 9 – FENCE REMOVAL

Hydrology and Water Quality

Even though livestock would be distributed across a larger Big Juniper Pasture, they would tend to concentrate in the Horseshoe Meadow during years of scheduled use (BLM 1998a, Wyman 2006). However, during these years, use would occur early in the season providing opportunities for regrowth. This enlarged pasture would be rested every other year. This would have a positive effect compared to late season or season long grazing under Alternative 1.

Water quality would be affected positively by the improving condition of the riparian vegetation surrounding the spring areas. The hydrologic function in the riparian area in Horseshow Meadow would improve over time. The area would likely make substantial progress towards meeting Rangeland Health Standard 2. These positive impacts would be greater (or faster progress) than Alternatives 1, 2A, 2B, 3, 4, and 5, but less (or slower progress) than Alternatives 6, 7, and 8.

No additional impacts to hydrology or water quality would be expected across the remainder of the allotment, similar to Alternative 1, because a rest rotation grazing system and the existing grazing standards (50% utilization) would remain in place.

Soils

Impacts from fence construction activities would be less under this alternative than Alternatives 2A, 2B, 6, 7, or 8. Short term impacts would be associated with building the approximate 3 miles of fence. Impacts would include clearing brush and vegetation along the fence line. Soil disturbance would be approximately 10' wide and 3 miles in length along the proposed fence.

Soil compaction may result from vehicles along the fence line during construction and removal activities. This impact would be short-term provided the access routes can be effectively closed after the project is complete.

Even though livestock would be distributed across a larger Big Juniper Pasture, they would tend to concentrate in the Horseshoe Meadow during years of scheduled use (BLM 1998a, Wyman 2006) causing some soil compaction in the meadow area. However, the enlarged pasture would be rested every other year. This would lead to improvement in the condition of the riparian vegetation surrounding the spring areas, decreasing the erosion potential in the meadow area over time. The area would likely make substantial progress towards meeting Rangeland Health Standard 2.

Impacts on soils from continuing a rest rotation grazing system across the remainder of the allotment would be similar to Alternative 1.

Vegetation

Riparian Vegetation

Even though livestock would be distributed across a larger Big Juniper Pasture, they would tend to concentrate in the Horseshoe Meadow during years of scheduled use (BLM 1998a, Wyman 2006). However, during these years, use would occur early in the season providing opportunities for riparian vegetation regrowth. This enlarged pasture would be rested every other year. This, coupled with the hydrologic and soil improvement described above, would result in improved health and vigor of the riparian vegetation in the meadow area and have a positive effect compared to late season or season-long grazing under Alternative 1. The Horseshoe Meadow area would likely make substantial progress towards meeting Rangeland Health Standard 2 over the long-term, but it would not progress as quickly as many of the other alternatives that provide rest or exclusion from grazing.

Impacts to riparian vegetation in other pastures of the allotment would be similar to Alternative 1.

Range and Woodland Vegetation

Short-term upland vegetative impacts would be associated with building approximately 3 miles of fence. Impacts would include clearing a small swath of vegetation along the fence line. Vegetation may also be compacted from driving vehicles along the fence line during construction and fence removal activities. Disturbance would be approximately 10' wide and 3 miles in length. Vegetative disturbance from fence construction would be more than Alternatives 1, 3, 4, or 5, but less than Alternatives 2A, 2B, 6, 7, or 8.

Upland vegetation in the Big Juniper/Horseshoe Pastures is in good condition and would likely remain in stable condition under this alternative. Some cattle are likely to congregate in the Horseshoe Meadow during years of scheduled use. However, this would be mitigated to some extent by using the pasture early in the growing season when the surrounding upland vegetation is more palatable. The upland vegetation in the enlarged pasture would benefit from every other year rest provided by this alternative.

Young invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands over the short and long-term similar to Alternative 1, unless a wildfire occurred in the vicinity.

The proposed new big pasture would be used early in the season and then rested the following year. In addition, one pasture would be lost from the rest rotation system. Though the other four pastures would continue to be grazed under a rest rotation system, there would be less opportunity for rest and deferment in these pastures under this alternative. For this reason, the upland vegetation in these remaining pastures could be negatively affected over the long-term.

Cultural and Special Status Plants

Under this alternative, there would be a slight increased risk of disturbance of cultural plants within the Horseshoe Pasture compared to Alternative 1. This disturbance would be less than Alternatives 2A, 2B, 6, 7, or 8. In some cases, there would be grazing upon these plants similar to Alternative 1. Impacts to cultural plants related to grazing the remainder of the allotment under a rest rotation system would be similar to Alternative 1.

The construction of the 3 miles of proposed fence on the ridgeline of Juniper Mountain would not impact special status plants, as the survey for this proposed fence found no plants. Likewise, fence removal activities would not impact sensitive plants. This area was surveyed for sensitive plants prior to construction of the existing fence and no special status plants were found. Impacts of continuing a rest rotation grazing system across the remainder of the allotment would be similar to Alternative 1.

Noxious Weeds

The potential risk of introducing new weed species to the allotment is directly related to the amount of potential ground disturbance associated with a given alternative. This risk under this alternative would be slightly higher than Alternatives 1, 3, 4, 5, or 7, but would be less than Alternatives 2A, 2B, 6, or 8. Impacts to on-going noxious weed treatment activities across the allotment would be similar to Alternative 1.

ACEC/RNA

The impacts to ACEC/RNA values of moving from a 6 to a 5-pasture rest rotation system would be similar to those described for Alternative 1. Monitoring may be needed in the future to determine if the management goal regarding maintaining healthy, biodiverse plant communities across the entire RNA, including the Horseshoe Meadow area, can be met under this alternative.

Wildlife and Special Status Animal Species

While 3 miles of new fence would be built, an additional 1.7 miles of fence would be removed resulting in little net fencing-related effects on wildlife species compared to Alternative 1. Wildlife impacts from fence construction would be minimized by restricting site preparation for fence construction to the immediate area of the proposed fence. Impacts to mule deer and antelope passage would be minimized by constructing to BLM wildlife passage specifications (BLM 1985).

Though some studies suggest that sage-grouse and other birds may collide with fences by accidentally flying into them (Call and Maser 1985; Connelly *et al.* 2004), the proposed net increase of 1.3 miles of fence under this alternative is relatively low. Further, this fencing is located several miles north of the nearest active lek (Map 2). For these reasons, fence related impacts to existing sage-grouse populations would be minimal under this alternative.

Cattle would still have access to the Horseshoe Meadow during the early growing season, every other year. However, due to plant re-growth and the rest provided under this alternative, there would likely be improvements in hydrologic, soil, and riparian vegetation conditions in the Horseshoe Meadow over time. This, in turn, would have some benefits to big game, migratory birds, special status species, and other wildlife that use the Horseshoe Pasture. The habitat improvements in the pasture would be better than Alternatives 1, 2A, 3, 4, and 5, but less than those expected under Alternatives 2B, 6, 7, or 8.

If conditions in the Horseshoe Meadow improve to the point of meeting or making substantial progress in meeting Rangeland Health Standard 2, then this alternative would conform to the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (page 75; ODFW 2005), as well as the ESA management goals for candidate species (sage-grouse). Continuing to graze the remainder of the allotment under a rest rotation grazing system would also conform to the sagegrouse guidelines as the majority of the allotment meets the rangeland health standards and appropriate livestock grazing regimes have been shown to be compatible with sage-grouse habitat needs (ODFW 2005; page 75).

Young, invasive western juniper would continue to expand within the Horseshoe Meadow and surrounding sagebrush uplands similar to Alternative 1, 2A, 3, 4, 5, 6, and 8, and would have similar negative effects on sagebrush-obligate and riparian-dependent wildlife habitats, including sage-grouse habitat. Allowing continued juniper encroachment in the meadow would not be consistent with the ESA management goals for candidate species (sage-grouse).

Other potential effects to wildlife, including migratory birds and special status species, across the remainder of the allotment would be the same as described for Alternative 1.

Cultural/Historic Resources

The construction of the 3 miles of fence on the ridgeline of Juniper Mountain would not impact cultural resources. The clearance for this proposed fence found no cultural resources in this area. Likewise, fence removal activities would not impact cultural resources. This area was surveyed for cultural resources in 2005 prior to the existing fence construction and no resources were found.

The impacts from livestock grazing on cultural resources within the Horseshoe Meadow would be similar to those described for Alternatives 1, 2A, and 2B. Cattle would tend to congregate around the Horseshoe Meadow during years when livestock are authorized to use the pasture, potentially trampling or disturbing cultural resources located on or near the soil surface.

The potential impacts of continuing livestock grazing across the remainder of the allotment (trampling and artifact collecting) would be similar to those described for Alternative 1.

Livestock Grazing Management

Under this alternative, the Juniper Mountain and Horseshoe Pastures would become one big pasture. This larger pasture (approximately 12,812 acres) would be used early in the growing season to provide opportunities for plant regrowth within the Horseshoe Meadow following removal of livestock. However, some livestock would tend to congregate within the Horseshoe Meadow during years when the pasture is scheduled for use. This would be mitigated to some extent by using the pasture early in the growing season when the surrounding upland vegetation is more palatable. The Horseshoe Meadow area would likely make substantial progress towards meeting Rangeland Health Standard 2 over the long-term, but it would not progress as quickly as many of the other alternatives that provide rest or exclusion from grazing.

The proposed new fence on the east side of Juniper Mountain would prevent cattle from traveling over Juniper Mountain into the Horseshoe Meadow area from the Radio Springs and Sagebrush Knoll Pastures. This would allow for more flexibility to use the Radio Springs and Sagebrush Knoll Pastures later in the growing season. (In recent years, these pastures could only be used early in the season or in conjunction with the adjacent Horseshoe Pasture because of problems with the riparian area in the Horseshoe Meadow). However, this alternative would also eliminate one pasture from the allotment, which would reduce the overall grazing management options available in the rest rotation system for the entire allotment, including during times of drought.

This alternative would allow livestock grazing at appropriate levels across the allotment as a whole, and should allow the rest of the allotment to continue to meet the rangeland health standards.

For these reasons, this alternative would meet most of the objectives of the purpose and need for action.

Socioeconomic Values

There would be some fence construction (\$8,000/mile) and removal (\$4,000/mile) costs under this alternative. Project costs are estimated at \$30,800 total. This cost would be greater than Alternative 1, but less than all other fencing alternatives.

Since there would be no loss of AUMs under this alternative, the economic impacts to the permittee would be similar to Alternative 1.

Recreation

There would be no direct impacts or changes to existing recreation opportunities in the remainder of the allotment under this alternative.

Visual

There would be some temporary impacts to the existing visual quality of the allotment as the existing fence was removed and the new fence was built. These impacts would be slightly greater than Alternatives 1, 3, 4, and 5, but less than Alternatives 2A, 2B, 6, 7, or 8. However, this alternative would meet the management objectives of VRM Class IV.

Fuels

The impacts to fuels would be the same as for Alternative 1.

CHAPTER V – INDIRECT AND CUMULATIVE IMPACTS

INDIRECT EFFECTS COMMON TO ALL ALTERNATIVES

Climate Change and Greenhouse Gas Emissions

Climate change has been identified during public comment as an issue that should be addressed in this environmental analysis. While most climate scientists agree that global climate trends over the past century are warming, there is still debate as to the timing and magnitude of temperature change and its effect on precipitation. Predictions of future climate conditions are generally based on outputs from broad-scale computer modeling studies. Such predictions can vary greatly depending upon which model is used and the assumptions and data that are plugged into the model. Further, the predictions cannot be tested in real time and or meaningfully stepped down into a project level analysis.

While many factors are known to have an effect on temperature and climate (ie. long-lived greenhouse gases, ozone, aerosols, water vapor, aviation contrails, surface albedo, and solar irradiance), not all have been studied at the same level of detail (Forster *et al.* 2007, Taylor 2009). Greenhouse gas levels represent one factor that has been widely studied in recent years. Forster *et al.* 2007 (pp. 129-234) reviewed scientific information on atmospheric constituents and radiative forcing and concluded that human-caused increases in greenhouse gas emissions since 1750 are extremely likely (95% confidence level) to have exerted a “substantial” warming influence on climate.

Based on its review of available science, the National Oceanic and Atmospheric Administration estimates that about 50% of the recent global warming is likely due to greenhouse gas increases caused by humans (NOAA undated). This implies that up to 50% of the warming trend is due to other causes and indicates there is still on-going scientific debate as to whether this trend is primarily a natural cycle, human-caused, or some combination of both.

The Council on Environmental Quality (CEQ) has stated that it is not currently useful within a given NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to a particular project or emissions, as such direct linkage is difficult to isolate and understand. CEQ also states that estimating greenhouse gas emissions can serve as a reasonable proxy for assessing potential impacts to climate (page 3; CEQ 2010). The U.S. Geological Survey recently reviewed the latest science on greenhouse gas emissions and concluded that it is currently beyond the scope of existing science to identify a specific source of greenhouse gas emissions or sequestration (storage) and designate it as the cause of specific climate impacts at a specific location (May 14, 2008 memorandum to the U.S. Fish and Wildlife Service). For this reason, climate change is discussed as a potential indirect effect associated with each alternative rather than a direct effect.

For the reasons identified above, the BLM has focused this climate change discussion on describing the effects of the proposed action and the alternatives on various greenhouse gas emissions and carbon sequestration. The most common greenhouse gases include (in descending order of atmospheric composition) water vapor, carbon dioxide, methane, and nitrous oxide. Of the four, water vapor is the most abundant and important, representing over 90% of all greenhouse gases present in the atmosphere (Forster *et al.* 2007; Taylor 2009). Methane and nitrous oxide emissions represent a very small percentage of all greenhouse gases in the U.S. and have declined between 1990 and

2007 (U.S. EPA 2009). None of the 10 alternatives analyzed in detail would have any measureable effect on atmospheric water vapor or nitrous oxide. For this reason, the remainder of this analysis focuses on carbon dioxide and methane emissions.

Vehicle Emissions

All of the alternatives that include fence construction or removal (2A, 2B, 6, 7, 8, and 9) would have additional short-term greenhouse gas emissions from vehicles traveling to and from the project area. The total amount of emissions would be highest for those alternatives (7 and 8), which involve the most fence construction. These emissions would last only during the construction season.

The following assumptions were used to calculate vehicle carbon dioxide emissions for each alternative:

- 1) A single medium-duty truck could haul the construction crew and fence materials to the site each day
- 2) 150 miles of driving roundtrip from Lakeview to the project site each day
- 3) Vehicle gets 15 miles to the gallon and consumes about 10 gallons of gas per trip
- 4) Construction crew is capable of constructing or removing about 0.25 miles of fence per day

Alternatives 2A, 2B, 6 (5 miles of fence) would take 20 days, 20 truck trips, and consume about 200 gallons of gas total.

Alternative 7 (7 miles of fence) would require 28 days, 28 truck trips, and consume about 280 gallons of gas total.

Alternative 8 (29.5 miles of fence) would require 118 days, 118 truck trips, and consume about 1,180 gallons of gas total.

Alternative 9 (3 miles of new fence and 1.7 miles of fence removal) would require 19 days, 19 truck trips, and consume about 190 gallons of gas total.

Alternatives 1, 3, and 4 do not include fence construction and would not require any construction trips to the allotment. Therefore, these alternatives would not involve consumption of additional gasoline.

Alternative 5 (increased herding) also does not require any fence construction. However, it would require the permittee to make daily round trips by vehicle to the allotment during the grazing season every year to herd cattle. Based on estimates provided by the permittee, approximately 23 gallons of gas would be consumed for each daily stock truck trip. The total estimated number of trips per grazing season varies from 150 to 210 trips depending upon the length of the grazing season. This translates into an annual gas consumption of about 3,450 to 4,830 gallons per year.

The total carbon dioxide emissions from vehicle travel can be estimated for each alternative based on the fuel consumption estimates above. The average carbon dioxide emissions from burning (ie. oxidizing) a gallon of gasoline is about 8,788 grams (U.S. EPA Undated) or about 0.0088 metric tons. Alternatives 1, 3, and 4 would result in no carbon dioxide emissions from vehicles. Alternatives 2A, 2B, 6, and 9 would result in about 1.67 to 1.76 metric tons total of carbon dioxide emissions. Alternative 7 would emit about 2.46 metric tons total of carbon dioxide. Alternative 8 would emit about 10.4 metric total of carbon dioxide. Alternative 5 would emit about 30.32 to 42.45 metric tons *annually*, and represents the highest total carbon emissions from vehicles of all the alternatives.

Between 1990 and 2007, the estimated annual total emissions of carbon dioxide from all transportation sources in the U.S. ranged from 1484.5 to 1887.4 teragrams (10^{12}) or 1,484,500,000 to 1,887,400,000 metric tons. The annual estimated total carbon dioxide emissions from all human sources in the U.S. ranged from 4,871,000,000 to 5,919,500,000 metric tons during this same time period (U.S. EPA 2009). Thus, the annual contribution of carbon dioxide from vehicle emissions associated with the 10 alternatives ranges from 0 to 0.0000025 % of the total U.S. transportation-related emissions. Further, the annual contribution of carbon dioxide from vehicle emissions associated with the 10 alternatives ranges from 0 to 0.00000072 % of the total of all U.S. human-related emissions.

The U.S. EPA only requires mandatory reporting from several industrial and agricultural sectors for total carbon

dioxide equivalent quantities greater than 25,000 metric tons per year (see 40 CFR 98.2). Further, the CEQ states that emissions less than this mandatory reporting requirement may not even warrant discussion within a given NEPA analysis (CEQ 2010, page 2). The total carbon emissions from vehicle use under all 10 alternatives is substantially lower than this reporting requirement. For these reasons, the BLM finds that these emissions are not significant.

Livestock Grazing

All 10 of the alternatives analyzed in detail involve the permitting of livestock use on the Juniper Mountain Allotment. Alternatives 1, 2A, 2B, 5, 6, 7, 8, and 9 include the authorization of up to 3,651 AUMs of active preference on the allotment. Alternatives 3 and 4 include reductions in this forage level. However, for purposes of this analysis it is assumed that this lost forage would be provided elsewhere in similar vegetation types within the region. Therefore, the BLM assumes that a similar number of livestock would graze and a similar amount of forage would be consumed within the allotment under all 10 alternatives.

Livestock grazing results in annual methane emissions as a result of ruminant digestion. Methane emission rates from cattle vary widely and depend on many variables (Johnson and Johnson 1995, DeRamus *et al.* 2003). Estimates for grazing cattle typically range from 80 – 101 kilograms of methane per year per animal (EPA 2009) or 6.7 - 9.2 kilograms of methane per month. This analysis will assume a methane emission rate of 8 kilograms of methane per cow per month or per animal unit month (AUM¹). Assuming that methane has a global warming potential 21 times carbon dioxide (U.S. EPA 2009, page ES-3), each AUM of rangeland grazing results in the emission of approximately 0.168 metric tons of carbon dioxide equivalent. Continuing to graze 3,651 AUMs per year would result in methane emissions of about 613 metric tons of carbon dioxide equivalent annually.

Current U.S. emissions of methane from all livestock total approximately 139 million metric tons of carbon dioxide equivalent per year (U.S. EPA 2009, page 6-2). In comparison, current U.S. emissions of all greenhouse gases total approximately 7 billion metric tons of carbon dioxide equivalent (U.S. EPA 2009, page 2-4) and current global emissions of all greenhouse gases total 25 billion metric tons of carbon dioxide equivalent (Denman *et al.* 2007, page 513). Emissions from continued grazing of 3,651 AUMs of forage would contribute approximately 0.0004% of the annual U.S. methane emissions from all U.S. livestock to the atmosphere, approximately 0.000009% of the annual U.S. emissions of all greenhouse gases, and approximately 0.000005% of the total global emissions of all greenhouse gases. Using the same rationale provided above for vehicle emissions, the BLM finds that the total carbon emissions from livestock grazing use under all 10 alternatives is not significant.

Livestock grazing can also affect rangeland carbon storage in vegetation and soils, through changes in plant community and changes in ecosystem processes, but the effects have been variable and inconsistent among the ecosystems studied (Schuman *et al.* 2009). Some studies have found that grazing can result in increased carbon storage compared to no grazing, because of increased plant regrowth and changes in plant species composition (Follett *et al.* 2001). One study examined the effects of different grazing systems on crested wheatgrass and native grassland communities in the Northern Great Plains and found all grazing treatments studied were strong sinks for soil organic carbon. Further, all grazing systems studied were found to be minor sinks for atmospheric methane (Leibig *et al.* 2010). Some studies have found changes in rangeland carbon from different grazing practices do not result in substantial changes in total ecosystem carbon, but result in redistribution of carbon, for example, from above-ground vegetation to root biomass (Dermer and Schuman 2007). Overall, changes in rangeland carbon storage as a result of changes in grazing practices, such as those proposed in Alternatives 1-10, are likely to be small and difficult to measure or predict, especially where a rangeland health assessment has determined that rangeland health standards are being met with current livestock management practices.

Based on the available science and the rangeland health determination (where standards are currently being met on the majority of the 91,000-acre allotment), the BLM concludes that the continued grazing of up to 3,651 AUMs of forage annually in the Juniper Mountain Allotment under all 10 of the alternatives would not result in any significant change in total carbon storage at either the local, regional (U.S.), or global scales.

¹ Animal unit month (AUM) means the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month. An AUM is the unit of livestock grazing authorization used by the Bureau of Land Management.

Juniper Removal (Alternative 2B)

The cutting of about 50 acres of scattered, young juniper within the Horseshoe Meadow area would have no measurable effect on total carbon storage at either the local, regional (U.S.), or global scales. The dead juniper trees would be left in place and would decay slowly over the next 50-100 years. Thus, the carbon released from decay would occur slowly over this same time frame. This carbon release would likely be offset by increased storage in adjacent riparian vegetation and upland grasses and shrubs due to increased health, vigor, and production in these communities.

CUMULATIVE EFFECTS

Introduction

Cumulative effect issues were raised during public comment opportunities, specifically with respect to wilderness resources, new fencing, sage grouse and pygmy rabbit population and habitat impacts, weeds, and microbiotic crusts, during the comment period on the original EA, as well as during later protest, appeal, and litigation submittals.

For the purposes of this analysis, cumulative impacts are considered at the allotment scale. The main reason for choosing this analysis scale is because the BLM has a good idea of other potential reasonably foreseeable actions that may occur within the allotment. Many of these potential future actions have been identified in the *Lakeview Resource Management Plan/Record of Decision*, Appendix E (BLM 2003b) or other documents (BLM 2004c). The timeframe of analysis is defined as the same 15-20 year expected life of the RMP/ROD.

The Council on Environmental Quality (CEQ) issued cumulative impact guidance on June 24, 2005, that states the “environmental analysis required under NEPA is forward-looking,” and review of past actions is required only “to the extent that this review informs agency decision-making regarding the proposed action.” Use of information on the effects of past action may be useful in two ways: one is for consideration of the proposed action’s cumulative effects, and secondly as a basis for identifying the proposed action’s direct and indirect effects.

The CEQ stated that “[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.” This is because a description of the current state of the environment (ie. affected environment section) inherently includes the effects of past actions. Further, the “CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions.” Information on the current environmental condition is more comprehensive and more accurate for establishing a useful starting point for a cumulative effects analysis than attempting to establish such a starting point by adding up the described effects of individual past actions to some environmental baseline condition in the past that, unlike current conditions, can no longer be verified by direct examination.

The second area in which the CEQ guidance states that information on past actions may be useful is in “illuminating or predicting the direct and indirect effects of a proposed action. The usefulness of such information is limited by the fact that it is anecdotal only, and extrapolation of data from such singular experiences is not generally accepted as a reliable predictor of effects”.

The Department of Interior issued some additional guidance related to past actions which state, “when considering the effects of past actions as part of a cumulative effects analysis, the Responsible Official must analyze the effects in accordance with 40 CFR 1508.7 and in accordance with relevant guidance issued by the Council on Environmental Quality, such as “The Council on Environmental Quality Guidance Memorandum on Consideration of Past Actions in Cumulative Effects Analysis” dated June 24, 2005, or any superseding Council on Environmental Quality guidance (see 43 CFR 46.115)”.

Known Past Activities

During public involvement opportunities for this proposal, no reviewer identified any need to exhaustively list individual past actions or to analyze, compare, or describe the environmental effects of individual past actions, in order to complete an analysis which would be useful for illuminating or predicting the effects of the proposed action.

A number of past disturbances have occurred in and immediately surrounding the allotment as part of past or current management activities. These include: road construction and maintenance, routes created by off-highway vehicle use, range improvement project construction and maintenance (fences, seedings, pipelines, waterholes, reservoirs, developed springs, and wells), and wildlife guzzler construction and maintenance. Based on a GIS analysis of current data for the allotment, at least 79.3 miles of maintained BLM roads and 67.1 miles of unmaintained routes (146.4 miles total) have been constructed or created within the allotment in the past. In addition, about 66.5 miles of fence, 0.7 miles of pipelines, 54 waterholes, 20 reservoirs, 6 springs, 3 guzzlers, and 1 well have been constructed within the allotment.

About 42 acres in the allotment were seeded with non-native grasses following one historic wildfire. In 2001, another wildfire burned approximately 4,565 acres of the northeastern portion of the allotment. This area was allowed to revegetate naturally.

All of these past activities have affected or shaped the landscape into what it is today. Current conditions are described further in the “Affected Environment” section of this document, as well as in the recent Rangeland Health Assessment for the allotment (BLM 2004c).

Reasonably Foreseeable Activities

The *Lakeview RMP/ROD*, Appendix E, page A-145 (BLM 2003b), lists removal or control of invasive juniper (non old-growth) as a possible future management action that could occur in the allotment during the life of the land use plan. However, it did not state specifically how many acres of treatment were proposed. Though it did not state specifically where on the allotment juniper treatment may occur, most of the juniper habitat on the allotment is located on or immediately around Juniper Mountain proper.

The *Lakeview RMP/ROD* also identified special management direction for the 6,355 acre Juniper Mountain ACEC/RNA portion of the allotment (pages 57-60, 67-68, and Map SMA-17; BLM 2003b). This management direction identified about 4.3 miles of existing roads that would be closed during the life of the plan, including the road (7155-AA) adjacent to the Horseshoe Meadow area in the Horseshoe Pasture, limiting OHV use within the ACEC to designated roads and trails, and closing an existing wood cutting area inside the ACEC boundary. New rights-of-ways and mineral development would be avoided or subject to restrictions, if proposed. Livestock grazing would continue within the ACEC/RNA, but could be adjusted using a variety of methods, to protect the relevant and important values.

In addition, on page 100, the RMP/ROD anticipated numerous types of operation and maintenance activities would occur in the allotment throughout the life of the plan including such things as “routine maintenance of existing roads, ditches, culverts, water control structures, recreation facilities, reservoirs, wells, pipelines, waterholes, fences, cattle guards, seedings, fish and wildlife structures, signs, and other similar facilities/projects”. The rangeland health assessment also recommended several existing water developments be maintained in order to improve riparian conditions (BLM 2004c). It is possible that all of the existing roads in the BLM Transportation Plan, and all fences, pipelines, and other water/range improvement projects found in the allotment could receive some level of maintenance during the life of the RMP/ROD, depending upon need and funding availability. Alternatives 2A, 2B, 6, 7, 8, or 9 would also require some limited maintenance associated with the proposed fences during this timeframe.

It is also possible that future noxious weed treatments could be necessary in small, site-specific portions of the allotment. Any such sites would be identified, treated, and monitored in accordance with the *Integrated Noxious Weed Control Program EA#OR-010-2004-03* (BLM 2004a). This prevention and treatment program would continue regardless of the alternative adopted as the final decision.

The small riparian area along Foley Creek that contains *Rorippa columbiae* has been identified for construction of a protective enclosure in the near future.

Cumulative Impacts Common to All Alternatives Analyzed In Detail

The cumulative effects of livestock grazing management (including fencing and water developments), noxious weed management, transportation management, juniper woodland management, fire management, and operation and maintenance activities have already been described and analyzed at the resource area scale in Chapter 4 of the *Lakeview Proposed RMP/Final EIS* (BLM 2003a). This previous analysis is incorporated by reference and will not be repeated here. The cumulative effects described in the following section are similar to or within the range of those already analyzed in Chapter 4 of the *Lakeview Proposed RMP/Final EIS* (BLM 2003a).

Future juniper treatment(s) on the allotment could involve the use of mechanical or prescribed fire methods primarily in post-settlement (less than 130 year old) stands in the Horseshoe Pasture and other northern pastures, though some limited treatment could involve removal of young juniper within old-growth stands to preserve the old-growth character associated with these stands. Such treatments could occur both inside and outside of the ACEC boundary and would be conducted in accordance with Forest and Woodlands management direction, pages 33-35, of the *Lakeview RMP/ROD* (BLM 2003b). A public firewood cutting area has also been established east of BLM Road 6185-00 (Map V-3; BLM 2003b). As a result, the overall health and diversity of the existing riparian, sagebrush, and old-growth juniper plant communities in the allotment would be improved by removing competition and releasing native grasses and shrubs (page 4-25; BLM 2003a). Such treatments could, over the long-term serve to maintain the existing static or upward condition trends or even reverse the downward trend of some vegetation communities (BLM 2004c) in treated portions of the allotment

The existing vehicle designation within the ACEC/RNA would benefit botanical resources and could reduce off-road vehicle disturbance, vegetation destruction, soil compaction, and erosion impacts associated with precipitation events in localized areas within the ACEC, including the Horseshoe Meadow area of Horseshoe Pasture. The beneficial effects of this designation has already addressed in the *Lakeview Proposed RMP/Final EIS* (page 4-97; BLM 2003a).

The types of routine operation and maintenance activities of existing facilities, including roads that are expected to occur on the allotment are typically categorically excluded from NEPA analysis due to the negligible level of negative or positive impacts anticipated, even when considered at a cumulative, national scale. The cumulative effects of these activities at the allotment scale are, likewise considered negligible. However, the riparian enclosure and water development maintenance activities that are anticipated at Coffee Pot, Southside, Juniper, and Radio Springs would individually and cumulatively improve water quality and riparian vegetation conditions. A site visit with ONDA in September 2006 did not reveal any concerns related specifically to the potential impacts associated with the maintenance of existing water developments and enclosures (site visit field notes dated September 22, 2006).

The small riparian enclosure constructed along Foley Creek would protect the existing *Rorippa columbiae* population from livestock grazing and trampling and, thus would assist in fulfilling management recommendations within the Conservation Strategy (BLM *et al.* 1996). Over the long-term, this fence would cumulatively add to the total amount of fence maintenance activities that would need to be completed.

The extent of future noxious weed treatment and the anticipated impacts associated with such treatment would likely be small, but is highly speculative and difficult to accurately estimate. Based on the current knowledge of where noxious weeds exist, common vectors of weed transport in the Lakeview Resource Area (vehicle use and water transport) (Map 1; BLM 2004a) and the low risk of existing sites expanding or new sites developing in the allotment, the cumulative impacts associated with future treatments are expected to be similar to and within the range of those identified and previously analyzed in the *Integrated Noxious Weed Control Program EA#OR-010-2004-03*; namely there would be a reduction in the overall introduction, spread, and establishment of noxious weeds across the landscape, higher awareness and education of the noxious weed problem, better inventory of weed locations, and improved upland and wet meadow ecosystem health (page 14; BLM 2004a).

Though it is difficult to predict the timing with any certainty, the big sagebrush and juniper habitats present in the allotment could be subject to another wildfire(s) in the foreseeable future if the right conditions occur. The *Lakeview Proposed RMP/Final EIS* describes typical fire return intervals for these vegetation types (page 2-83, BLM 2003a). The amount and age of old-growth juniper present on Juniper Mountain indicates a much longer fire return interval for this area than are typical for juniper woodland habitats elsewhere in the resource area. The impacts of any future wildfire(s) would vary depending upon the frequency of ignitions, fuel loads, moisture content, intensity of the burn, amount of area burned, and fire suppression tactics and rehabilitation methods used. In general, wildfire moves later vegetative seral stages (shrub and woodland) back to earlier vegetative stages (grass and forb), removes crust cover, and can make an area more susceptible to noxious weed or cheatgrass invasion. Most of the alternatives (except for Alternative 2B) would not reduce current or future wildfire risk, but the invasive juniper treatments mentioned above, in conjunction with juniper removal from the designated firewood collection area could reduce woody fuel loads in portions of the allotment over the long-term.

In most areas of their range, Greater sage-grouse have experienced population level declines from historic numbers. In portions of their range populations are still declining. Reasons for these declines have been attributed to a number of factors including habitat loss from conversion of sagebrush habitat to agriculture and more recently to oil and gas development. Wind energy developments could also have potential effects on sage-grouse populations, but research data is currently not sufficient to quantify such impacts. In Oregon, conversion of sagebrush habitat to crested wheatgrass seedings and a reduction in predator control activities have also contributed to population declines (ODFW 2005). Despite these factors, Oregon has had relatively stable sage-grouse population since 1973 (ODFW 2005). The habitat modification associated with all of the alternatives analyzed would be small (6.1 to 35.8 acres) when compared to the millions of acres of habitat remaining in Oregon (see Figure 1, ODFW 2005) and would have no measureable additive effects on populations at either the district or eastern Oregon-wide scales. The potential cumulative effects at the local population scale (ie. allotment) are discussed below under the individual alternative analysis discussions.

The removal of invasive juniper from sagebrush communities, as described above, would have an additive cumulative benefit on sagebrush obligate wildlife species and their habitat, including sage-grouse and pygmy rabbits. The removal of invasive juniper within old-growth juniper stands would have an additive cumulative benefit on wildlife species that use or prefer old-growth juniper habitat. Stand-replacing wildfires would likely have a cumulative negative impact on sagebrush and juniper woodland wildlife species and habitat, including sage-grouse and pygmy rabbits. The net cumulative effects would ultimately depend upon how much habitat is treated or burned over time.

Other than the direct and indirect impacts already described in Chapter 4, there would be no cumulative or other impacts to hydrology, soils, ACEC/RNA values, cultural or historic resources, livestock grazing management, social-economic values, recreation, or visual resources expected from any of the alternatives analyzed in detail.

Alternative 1 – No Action

In addition to the cumulative effects described above that would be common to all alternatives, the following cumulative effects could occur specifically related to continuation of current management under this alternative.

The continuing of current livestock management in the allotment, in conjunction with the impacts associated with most of the other foreseeable future actions described above, would likely result in one of the least effective rest-rotation grazing systems. Most of the pastures in the allotment would receive adequate rest and meet the 5 rangeland health standards; however, the Horseshoe Pasture would continue to receive use from unauthorized livestock drift from adjacent pastures.

The Horseshoe Meadow, the largest riparian area in the allotment, would not receive adequate rest during years when the Horseshoe Pasture is scheduled to be rested and would likely continue to have degraded water quality and riparian conditions and fail to meet Rangeland Health Standard 2. Ongoing maintenance of other springs and exclosure fences within the allotment would cumulatively improve water quality and riparian vegetation conditions elsewhere in the allotment, but to a much lesser degree than any of the other action alternatives.

Within the uplands across the allotment a long-term static or upward condition trend would continue across at least

73% of the upland range and woodland vegetation communities of the allotment (BLM 2004c). The only reasonably foreseeable future action that would likely alter this on-going trend would be invasive juniper treatment or wildfire, which would result in a change in vegetative communities similar to that described above as common to all alternatives. The exact aerial extent of this potential impact cannot be predicted. The net cumulative effects on vegetation and wildlife habitat (including sage-grouse and pygmy rabbit) across the allotment would ultimately depend upon how much habitat is treated or burned over time.

Approximately 3.5 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 142.9 miles within the allotment. At the allotment scale, this represents a minimal loss of motorized public and recreational access and a minimal gain in primitive, non-motorized recreation opportunities. People would no longer be able to use motorized vehicles to access the top of Juniper Mountain, but would still be able to hike, ride horses, or ride mountain bikes into the area.

The closure of Road 7155-AA may protect some cultural resources by making it harder for artifact collectors to reach the Horseshoe Meadow area. Roads can also fragment wildlife habitat and the resulting traffic can cause disturbances to wildlife species during crucial periods of their reproductive life cycles. Closure of Road 7155-AA would likely have a minimal additive cumulative benefit to wildlife species as this road receives very little use during the crucial reproductive periods for most wildlife species. In addition, hunters would lose access to this road which is currently used in the legal pursuit of game species during the fall. In general, this closure would result in a decrease in risk of spreading noxious weeds within the Horseshoe Pasture due to vehicle use.

The existing, predominantly natural character of the allotment would be subject to primarily natural changes over time (ie. drought, insects and disease, and fire) and would not change significantly in the short-term. The reduction in open motorized routes in the Horseshoe Pasture would improve the overall natural quality within the allotment slightly over time as the routes reclaim following closure.

Alternative 2A

In addition to the cumulative effects described above that would be common to all alternatives, the following cumulative effects could occur specifically related to this alternative.

The proposed 5 miles of new fence, when added to the 66.5 miles of existing fence in the allotment, would cumulatively benefit or assist the permittee in operating the most effective rest-rotation system where all pastures in the allotment receive adequate rest and meet or are moving rapidly towards meeting all of the 5 rangeland health standards.

The rest provided to the Horseshoe Meadow, paired with the ongoing maintenance of other springs and enclosure fences would cumulatively improve water quality and riparian vegetation conditions across the allotment.

The cumulative impacts of the proposed fence, when added to the continuation of current livestock management in the southern pastures and other foreseeable future actions described above, would result in a continuing long-term static or upward trend in the condition of upland vegetation communities across the allotment. This alternative (along with Alternative 2B) would result in the most effective rest-rotation grazing system, with the entire allotment receiving periodic growing season rest. Implementation of an effective grazing system across the allotment would meet or make significant progress toward fulfillment of the 5 Rangeland Health Standards.

The only reasonably foreseeable future action that would likely alter this on-going trend would be wildfire, which could result in a change in vegetative communities similar to that described above as common to all alternatives. The exact aerial extent of this impact cannot be predicted. The net cumulative effects on vegetation and wildlife habitat (including sage-grouse and pygmy rabbit) across the allotment would ultimately depend upon how much habitat is treated or burned over time.

Approximately 3.5 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 142.9 miles within the allotment. At the allotment scale, this represents a minimal loss of public and recreational motorized access similar to Alternative 1 and a minimal gain in primitive, non-motorized recreation opportunities. Overall, the potential additive cumulative impacts of closing Road 7155-

AA would be similar to Alternative 1.

The overall natural character of the allotment would be negatively affected by the construction of additional fencing. However, this would be offset somewhat by the reduction in open motorized routes in the same pasture. The overall natural quality within the pasture should improve slightly as the routes begin to reclaim following closure and the riparian area condition improves. The overall natural character of the rest of the allotment would be similar to Alternative 1 and would not change significantly over time.

Alternative 2B

The majority of the potential additive cumulative effects associated with this alternative would be similar to Alternative 2A.

The proposed meadow restoration activities in the Horseshoe Meadow, paired with the ongoing maintenance of other springs and enclosure fences would cumulatively improve water quality and riparian vegetation conditions across the allotment. These restoration activities are expected to accelerate the Horseshoe Meadow toward meeting standard 2 of the Rangeland Health Standards faster than Alternative 2A. In addition, there would be some treatment of non old-growth juniper within the meadow, which in combination with other possible juniper treatments described above as common to all alternatives, would have an additive, cumulative benefit in overall reduction of expanding juniper and improvement in upland and wet meadow vegetation communities and wildlife habitat (including sage-grouse and pygmy rabbit) across the allotment.

Alternative 3

In addition to the cumulative effects described above that would be common to all alternatives, the following cumulative effects could occur specifically related to this alternative.

It is unlikely that the proposed reduction in grazing across the allotment would actually occur in the Horseshoe Meadow due to the tendency of livestock to congregate near water late in the season. For this reason, the additive cumulative impacts on water quality and riparian conditions would be similar to Alternative 1.

Since 73% of the allotment already exhibits a long-term static or upward trend in the condition of upland vegetation communities, reducing livestock grazing 50% every year, in conjunction with the impacts of other foreseeable future actions described above, would likely result in only a slight overall improvement in upland vegetation communities across the allotment over time. The only reasonably foreseeable future action that would likely alter this on-going trend would be wildfire, which would result in a change in vegetative communities similar to that described above as common to all alternatives. The exact aerial extent of this impact cannot be predicted.

Less grazing pressure could translate into more grass and forb plant species being available across the allotment as browse for wildlife species every year. This increase in forage, in combination with the improvements in sagebrush and old-growth juniper habitats (described above from the removal of invasive juniper as common to all alternatives) could have a slightly additive or synergistic cumulative benefit on sagebrush obligate and old-growth wildlife species. The net cumulative effects would ultimately depend upon how much habitat is treated over time.

Approximately 3.5 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 142.9 miles within the allotment. At the allotment scale, this represents a minimal loss of public and recreational motorized access similar to Alternative 1 and a minimal gain in primitive, non-motorized recreation opportunities. Overall, the potential additive cumulative impacts of closing Road 7155-AA would be similar to Alternative 1.

Since no new developments are proposed under this alternative, the potential impacts to the overall natural character within the allotment would be similar to Alternative 1 and would not change significantly over time.

Alternative 4

In addition to the cumulative effects described above that would be common to all alternatives, the following

cumulative effects could occur specifically related to this alternative.

It is unlikely that the removal of grazing every other year would alter the livestock use in the Horseshoe Meadow during grazed years due to the tendency of livestock to congregate near water late in the season. For this reason, the additive cumulative impacts on water quality and riparian conditions would be similar to Alternative 1.

Cumulative impacts to upland range and woodland vegetation communities across the allotment would be similar to Alternative 3 (slight overall improvement in upland vegetation communities across the allotment over time). The only reasonably foreseeable future action that would likely alter this on-going trend would be wildfire, which would result in a change in vegetative communities similar to that described above as common to all alternatives. The exact aerial extent of this impact cannot be predicted. The net cumulative effects on vegetation and wildlife habitat (including sage-grouse and pygmy rabbit) across the allotment would ultimately depend upon how much habitat is treated or burned over time.

More grass and forb species could be available as browse for wildlife species during rest years, compared to Alternative 1. This increase in forage, in combination with the improvements in sagebrush and old-growth juniper habitats (described above from the removal of invasive juniper as common to all alternatives) could have a slightly additive or synergistic cumulative benefit on sagebrush obligate and old-growth wildlife species. The net cumulative effects would ultimately depend upon how much habitat is treated over time.

Approximately 3.5 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 142.9 miles within the allotment. At the allotment scale, this represents a minimal loss of public and recreational motorized access similar to Alternative 1 and a minimal gain in primitive, non-motorized recreation opportunities. Overall, the potential additive cumulative impacts of closing Road 7155-AA would be similar to Alternative 1.

Since no new developments are proposed under this alternative, the impacts to overall natural character within the allotment would be similar to Alternative 1 and would not change significantly over time.

Alternative 5

In addition to the cumulative effects described above that would be common to all alternatives, the following cumulative effects could occur specifically related to this alternative.

If herding proves effective in keeping livestock out of the Horseshoe Meadow during periods of scheduled rest, the additive cumulative impacts, when paired with the ongoing maintenance of other springs and exclosure fences would be to improve water quality and riparian conditions across the allotment. However, if herding is not effective, the additive cumulative water quality and riparian impacts would be similar to Alternative 1.

The cumulative impacts to upland range and woodland vegetation, and associated wildlife habitats (including sage-grouse and pygmy rabbits) across most of the allotment would be similar to Alternative 1.

Approximately 3.5 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 142.9 miles within the allotment. At the allotment scale, this represents a minimal loss of public and recreational motorized access similar to Alternative 1 and a minimal gain in primitive, non-motorized recreation opportunities. Overall, the potential additive cumulative impacts of closing Road 7155-AA would be similar to Alternative 1.

Since no new developments are proposed under this alternative, the impacts to overall natural character opportunities within the allotment would be similar to Alternative 1 and would not change significantly over time.

Alternative 6

In addition to the cumulative effects described above that would be common to all alternatives, the following cumulative effects could occur specifically related to this alternative.

The proposed 7 miles of new fence, when added to the 66.5 miles of existing fence in the allotment, would cumulatively benefit or contribute to the ability for the permittee to operate an effective rest-rotation system where all pastures in the allotment receive adequate rest and continue to meet or are moving rapidly towards meeting all five rangeland health standards.

The permanent rest provided to the Horseshoe Meadow, paired with the on-going maintenance of other springs and enclosure fences would cumulatively improve water quality and riparian vegetation conditions across the allotment compared to Alternative 1.

The cumulative effects to upland range and woodland vegetation communities across most of the allotment would be similar to Alternative 1. There are two reasonably foreseeable future actions that would have the possibility of altering this on-going static/upward trend:

- 1) The occurrence of wildfire would result in a change in vegetative communities similar to that described above as common to all alternatives. The exact aerial extent of this impact cannot be predicted. The net cumulative effects on vegetation and wildlife habitat (including sage-grouse and pygmy rabbit) across the allotment would ultimately depend upon how much habitat is treated or burned over time.
- 2) The other action is the potential for increased grazing pressure on other pastures in the allotment, resulting from the loss of AUMs in the east half of the Horseshoe Pasture to cause a downward trend in vegetation condition. However, monitoring (as described under the direct effects in Chapter IV) would continue to occur, and if the long-term trend was downward, the appropriate steps would be taken to adjust AUMs in accordance with 43 CFR 4110.3, 4110.3-2, and 4113.3-3.

If increased grazing pressure created a downward trend, there could be less grass and forb plant species available across the allotment as browse for wildlife species. This decrease in forage, in combination with other actions described above, could have a slightly additive negative cumulative effect on sagebrush obligate and juniper old-growth dependent wildlife species.

Approximately 3.5 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 142.9 miles within the allotment. At the allotment scale, this represents a minimal loss of public and recreational motorized access similar to Alternative 1 and a minimal gain in primitive, non-motorized recreation opportunities. Overall, the potential additive cumulative impacts of closing Road 7155-AA would be similar to Alternative 1.

The overall natural character of the allotment would be negatively affected by the construction of additional fencing. However, this would be offset somewhat by the reduction in open motorized routes in the Horseshoe Pasture. The overall natural quality within the pasture should improve as the routes reclaim following closure and the riparian area condition improves. The overall natural character of the rest of the allotment would be similar to Alternative 1 and would not change significantly over time.

Alternative 7

In addition to the cumulative effects described above that would common to all alternatives, the following cumulative effects could occur specifically related to this alternative.

The proposed 5 miles of new fence, when added to the 66.5 miles of existing fence in the allotment, would cumulatively benefit or contribute to the ability for the permittee to operate an effective rest-rotation system where all pastures in the allotment receive adequate rest and meet or are moving rapidly towards meeting all of the 5 rangeland health standards.

The permanent rest provided to the Horseshoe Meadow, paired with the ongoing maintenance of other springs and enclosure fences would cumulatively improve water quality and riparian vegetation conditions across the allotment similar to Alternative 6.

Cumulative effects to upland range and woodland vegetation communities across most of the allotment would be similar to Alternative 1. There are two reasonably foreseeable future actions that would have the possibility of

altering this on-going static/upward trend:

- 1) The occurrence of wildfire would result in a change in vegetative communities similar to that described above as common to all alternatives. The exact aerial extent of this impact cannot be predicted. The net cumulative effects on vegetation and wildlife habitat (including sage-grouse and pygmy rabbit) across the allotment would ultimately depend upon how much habitat is treated or burned over time.
- 2) The other action is the potential for increased grazing pressure on other pastures in the allotment, resulting from the loss of AUMs from the Horseshoe Pasture to cause a downward trend in vegetation condition. However, monitoring (as described under the direct effects in Chapter IV) would continue to occur, and if the long-term trend was downward, the appropriate steps would be taken to adjust AUMs in accordance with 43 CFR 4110.3, 4110.3-2, and 4113.3-3.

Cumulative impacts to wildlife and wildlife habitat across the allotment would be similar to that of Alternative 6, but greater in magnitude because grazing would be excluded from the entire Horseshoe Pasture. The effect on wildlife from the road closure would be similar to Alternative 6.

Approximately 8 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 138.4 miles within the allotment. This represents the largest reduction in motorized routes of all the alternatives analyzed. At the allotment scale, this represents a minimal loss of public and recreational motorized access, but the largest potential gain in primitive, non-motorized recreation opportunities. The potential impacts of road closures within this pasture would provide the greatest benefit of all the alternatives to cultural resources by making it more difficult for artifact collectors to access the area. However, hunters would lose additional road access for the legal pursuit of game hunting. In general, this alternative would close the most roads and provide the greatest reduction in risk of weed spread by vehicle use.

The natural character of the allotment would be negatively affected by the construction of additional fencing. However, this would be offset by the closure of all motorized routes in the Horseshoe Pasture, removal of developments at Horseshoe Spring. The overall natural quality of the pasture should improve as the routes and other water developments reclaim and the riparian area condition improves. The overall natural character of the rest of the allotment would be similar to Alternative 1 and would not change significantly over time.

Alternative 8

In addition to the cumulative effects described above that would be common to all alternatives, the following cumulative effects could occur specifically related to this alternative.

The proposed 22.5 miles of new fence, when added to the 66.5 miles of existing fence in the allotment, would result in the largest amount of total ground disturbance of any of the proposed alternatives. However, it would cumulatively benefit or contribute the most flexibility to the permittee to operate a more effective rest-rotation system with more pastures. It is expected that all pastures in the allotment would receive adequate rest and would meet or would move rapidly towards meeting all of the 5 rangeland health standards.

The rest provided to the Horseshoe Meadow, paired with the ongoing maintenance of other springs and enclosure fences would cumulatively improve water quality and riparian vegetation conditions across the allotment similar to Alternative 6.

Cumulative impacts to upland range and woodland vegetation communities and wildlife habitat (including sage-grouse and pygmy rabbit) across the allotment would be similar to Alternative 6.

Approximately 3.5 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 142.9 miles within the allotment. At the allotment scale, this represents a minimal loss of public and recreational motorized access similar to Alternative 1 and a minimal gain in primitive, non-motorized recreation opportunities. Overall, the potential additive cumulative impacts of closing Road 7155-AA would be similar to Alternative 1.

The impacts to the overall natural character within the Horseshoe Pasture would be similar to Alternative 6.

However, the additional 22.5 miles of fencing proposed in other pastures, when considered in connection with other existing developments (146.4 miles of motorized routes, 66.5 miles of fence, 0.7 miles of pipelines, 54 waterholes, 20 reservoirs, 6 springs, 3 guzzlers, and 1 well) within the allotment would have a negative impact on the overall natural character of the rest of the allotment.

Alternative 9

In addition to the cumulative effects described above that would be common to all alternatives, the following cumulative effects could occur specifically related to this alternative.

The proposed 3 miles of new fence and removal of 1.7 miles of fence would result in a net gain of 1.3 miles of fence. This represents the least amount of new fencing of any of the proposed fencing alternatives (2A, 2B, 6, 7, or 8). The total amount of new ground disturbance, when added to the 66.5 miles of existing fence in the allotment, would be less than Alternatives 2A, 2B, 6, 7, and 8, but more than Alternatives 1, 3, 4, and 5 across the allotment. This alternative would reduce the total number of pastures available for grazing (though it would not reduce the total *area* available for grazing) and would, therefore, reduce the amount of flexibility available to the permittee to operate an effective rest-rotation system.

The rest provided to the Horseshoe Meadow, paired with the ongoing maintenance of other springs and enclosure fences would cumulatively improve water quality and riparian vegetation conditions across the allotment.

The cumulative impacts to upland range and woodland vegetation and associated wildlife habitat (including sage-grouse and pygmy rabbit) across most of the allotment would be similar to Alternative 1.

Approximately 3.5 miles of motorized routes would be permanently closed under this alternative, reducing the cumulative total route number down to 142.9 miles within the allotment. At the allotment scale, this represents a minimal loss of motorized public and recreational access similar to Alternative 1 and a minimal gain in primitive, non-motorized recreation opportunities. Overall, the potential additive cumulative impacts of closing Road 7155-AA would be similar to Alternative 1.

The natural character of the Horseshoe Pasture would be negatively affected by the construction of an additional 3 miles of fence. However, this would be offset by the removal of 1.7 miles of fence within the Horseshoe and Big Juniper Pastures. This impact would also be offset by the reduction in open motorized routes in the Horseshoe Pasture. The overall natural quality within the combined pasture should improve slightly over time as the routes reclaim following closure and the riparian area condition improves. The overall natural character of the rest of the allotment would be similar to Alternative 1 and would not change significantly over time.

CHAPTER VI - PREPARER/CONTRIBUTORS AND LITERATURE CITED

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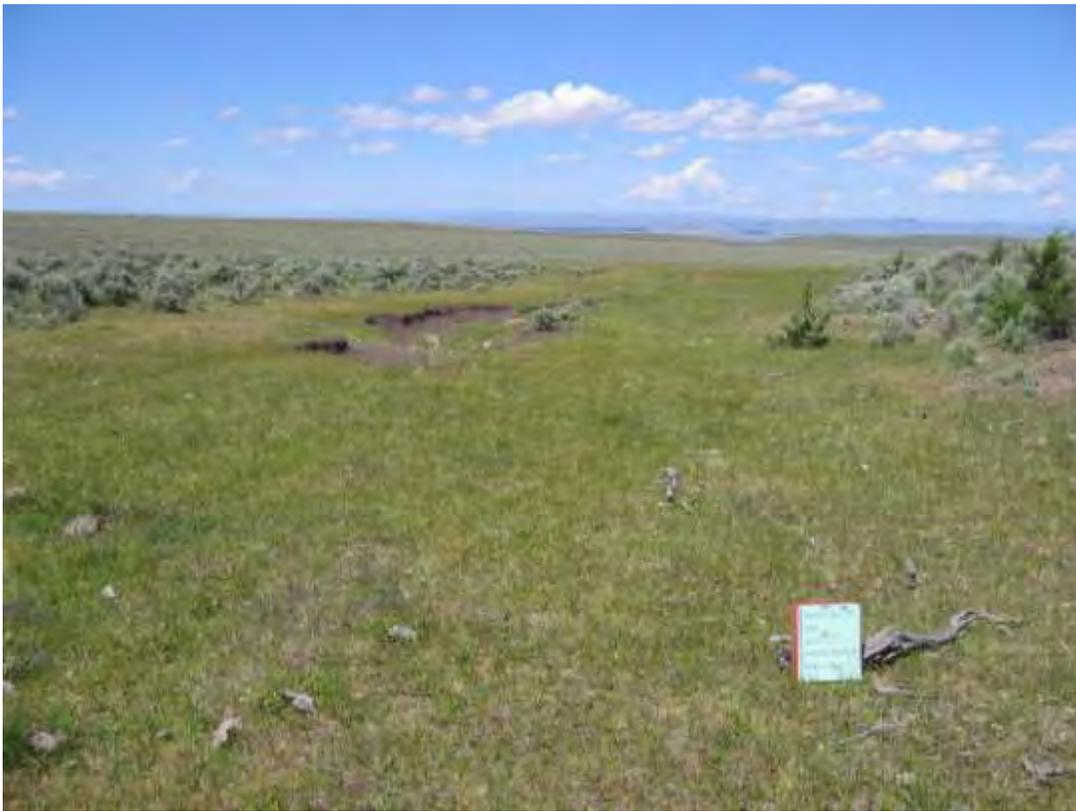


Photo 1 - Looking west at Horseshoe Meadow (June 30, 2004)



Photo 2 - Looking east at Horseshoe Meadow (June 30, 2004)



Photo 3 - Looking east at Horseshoe Meadow and Road 7155-AA (August 31, 2004)



Photo 4 - Looking east at Horseshoe Meadow headcut (August 3, 2004)



Photo 5 - Looking east at Horseshoe Meadow (July 27, 2005) during year of scheduled rest (edge of headcut on right)



Photo 6 - Looking west at Horseshoe Meadow (July 27, 2005) during year of scheduled rest



Photo 7 - Looking east at Horseshoe Meadow (May 18, 2006) showing early season livestock use



Photo 8 - Looking west at Horseshoe Meadow (October 2, 2006) after scheduled early season use and late (growing) season rest provided by herding and BLM compliance monitoring



Photo 9 - Looking east at Horseshoe Spring and Meadow (July 2, 2007) during year of scheduled rest



Photo 10 - Looking west at Horseshoe Meadow and BLM Road 7155-AA (July 2, 2007) during year of scheduled rest



Photo 11- Looking east at Horseshoe Meadow (November 18, 2008) after scheduled early season use and late (growing) season rest



Photo 12 - Looking west at Horseshoe Meadow (November 18, 2008) after scheduled early season use and late (growing) season rest



Photo 13 – Typical young western juniper invading the Horseshoe Meadow

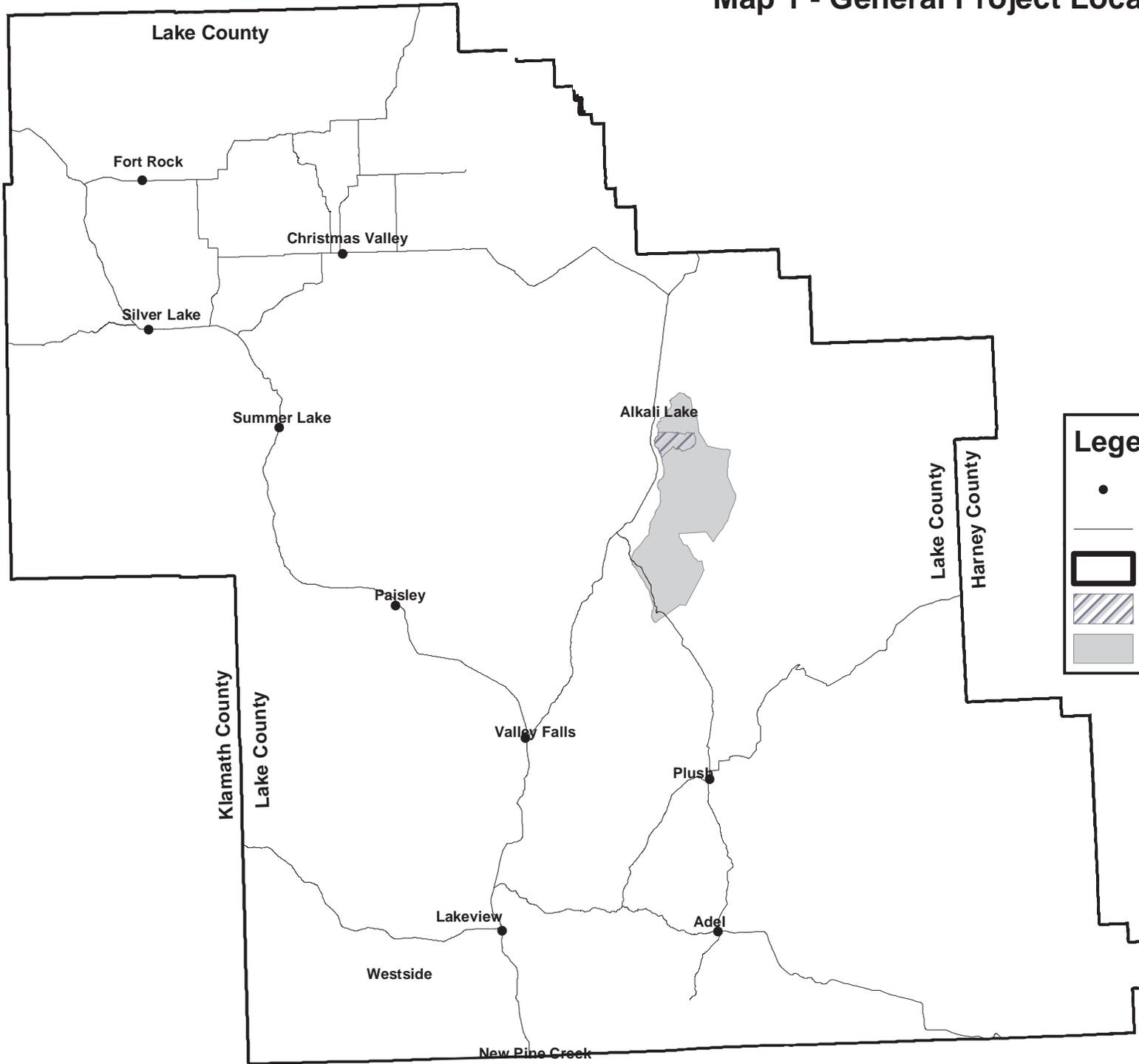


Photo 14 – Looking east at Horseshoe Meadow (September 23, 2009) after a year of scheduled rest



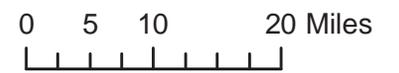
Photo 15 – Looking west at Horseshoe Meadow (September 23, 2009) after a year of scheduled rest

Map 1 - General Project Location

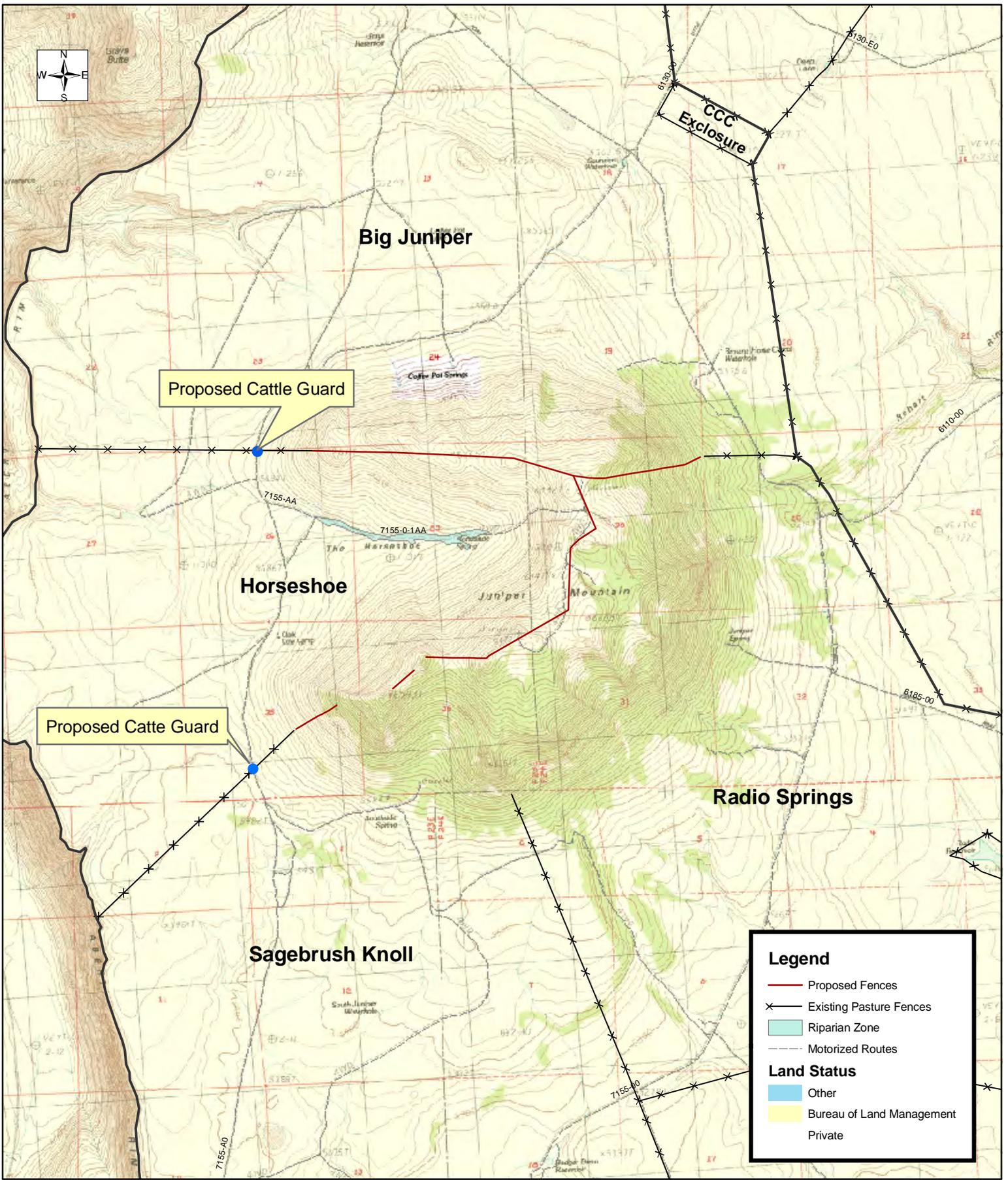


Legend

- Cities
- Major Roads
- ▭ Lakeview Resource Area
- ▨ Horseshoe Pasture
- Juniper Mountain Allotment

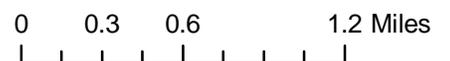


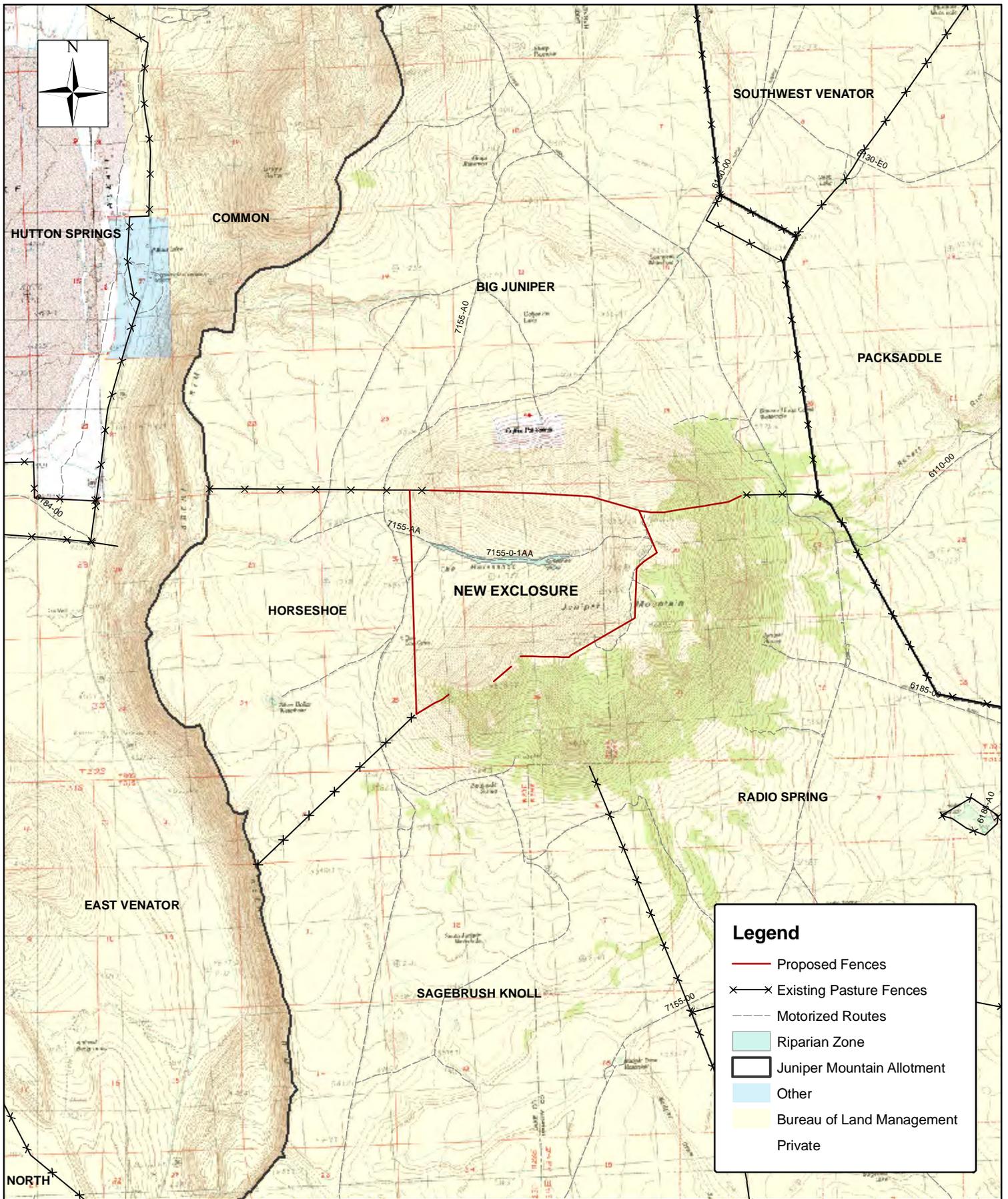
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Map 3 - Alternatives 2A and 2B

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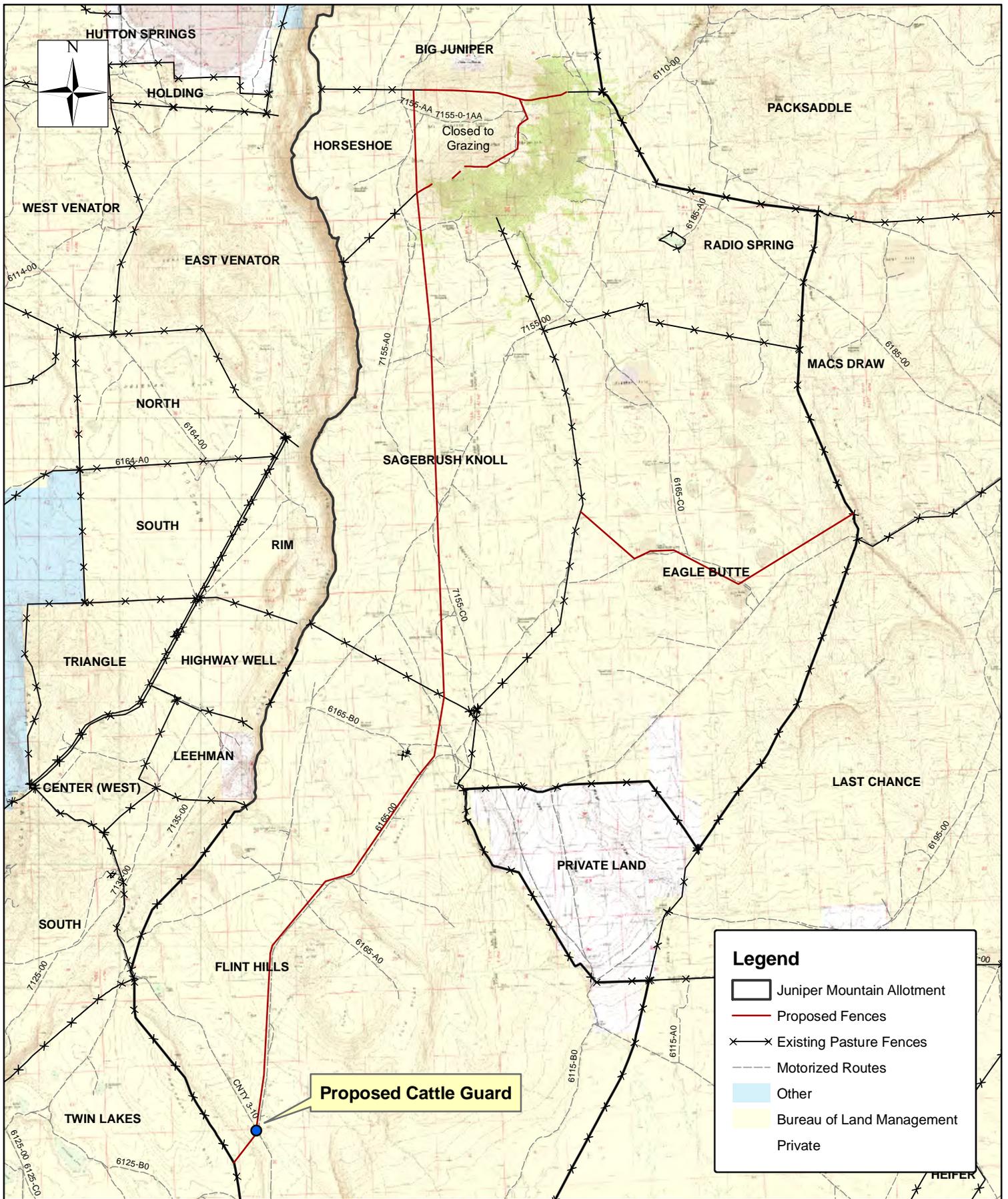


Map 4 - Alternative 6

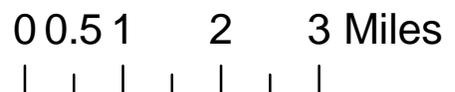


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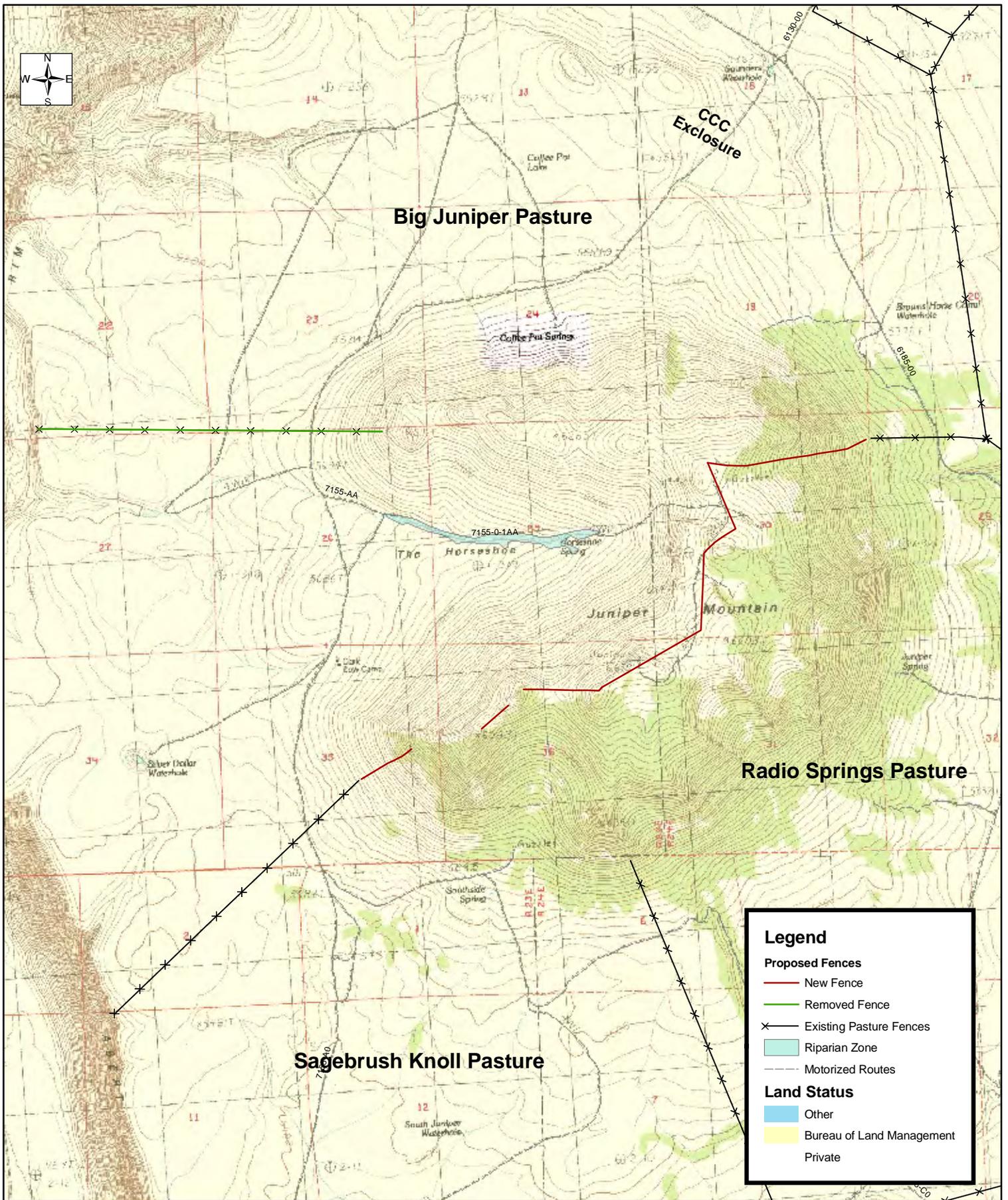




Map 5 - Alternative 8

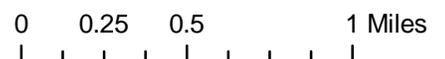


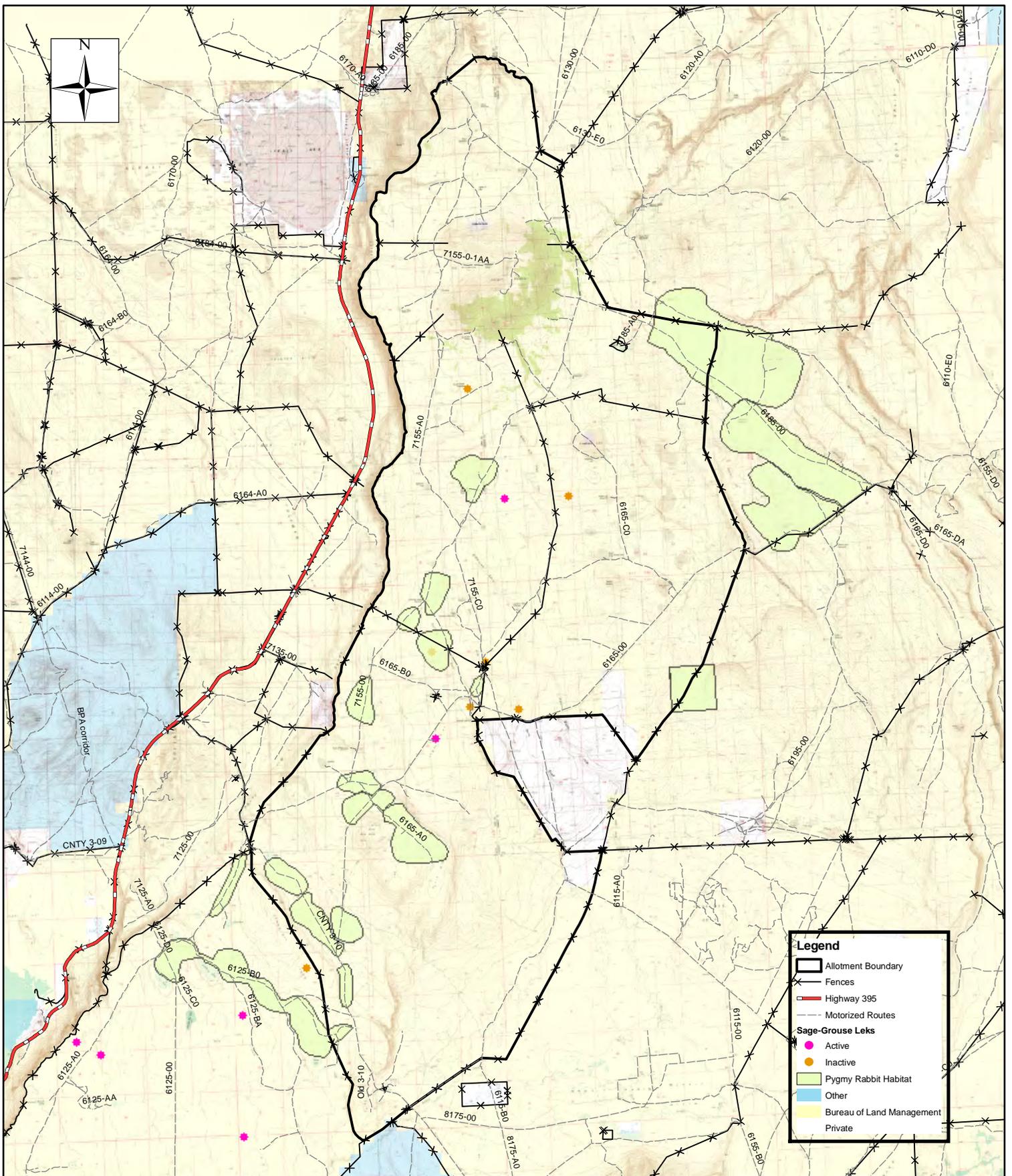
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Map 6 - Alternative 9

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Map 7 - Sage-Grouse Leks and Pygmy Rabbit Habitat within the Juniper Mountain Allotment



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