UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Burns District Office
Three Rivers Resource Area
Finding of No Significant Impact

June 24, 2011
Environmental Assessment
DOI-BLM-OR-050-2009-0053-EA

INTRODUCTION

Three Rivers Resource Area, Burns District Bureau of Land Management (BLM), has prepared an Environmental Assessment (EA) to analyze the potential effects of the issuance of the Term Grazing Permit, to make progress toward achieving standards and guidelines not met, and proposed range improvement projects within Happy Valley Allotment #5309.

Happy Valley Allotment is located 50 miles southeast of Burns, Oregon. Happy Valley Allotment consists of ten pastures and two exclosures: Tank, West Field, Fisher Field, North, North Big Hill, South Big Hill, Government Field, Deep Creek, Hay Meadow, and Smyth Creek and Riddle Creek Exclosures. There are 16,785 acres of BLM-managed land plus 2,577 acres of private land within the allotment for a total of 19,362 acres. The allotment is part of the Kiger Wild Horse Herd Management Area (HMA), Kiger Mustang Area of Critical Environmental Concern (ACEC), and the Steens Mountain Cooperative Management and Protection Area (CMPA).

SUMMARY OF THE PROPOSED ACTION

The Proposed Action would include the issuance of grazing permit #3602315 for 2,107 active AUMs of livestock grazing on public land from April 1 to October 15 with new terms and conditions, and range improvement projects to make measurable progress toward achieving Standards for Rangeland Health.

A. Proposed Management

To achieve Standards for Rangeland Health, achieve resource objectives and continue to conform to Guidelines of Livestock Grazing Management proposed management includes:

1. Livestock Grazing Management:

   a. Livestock grazing management would be authorized to provide periodic growing season rest for upland vegetation in each pasture every other year.

b. Grazing management in riparian areas would be designed to limit or remove grazing to support adequate vegetation that maintains channel and bank stability in Frog Creek.

c. Current permitted season of use would remain April 1 to October 15.

d. Flexibility in grazing management within the permitted season of use would be authorized if necessary to change pasture rotation and time of use to achieve resource objectives.

2. Range Improvement Projects: General Project Design Elements would be implemented as described in the Allotment Management Plan (AMP)/EA.

a. Frog Creek, build a 4-strand, barbed-wire exclosure fence located in South Big Hill Pasture (T. 29 S., R. 34 E., Sections 33 and 34; T. 30 S., R. 34 E., Section 4). Exclosure would be approximately 65 acres in size, and would exclude both livestock and wild horse use. Install troughs and pipe water from Frog Creek that would provide adequate water for livestock and wild horses and improve or maintain livestock distribution.

b. Crested Wheatgrass Seedings, maintenance/rehabilitation and improve late season forage for mule deer winter range and livestock in West Field and North Pastures. Rehabilitate 940 acres in West Field Pasture (T. 28 S., R. 33 E., Sections 6, 7, 8, 9, 17, and 18) by reducing sagebrush with a brush mower and seeding 200 acres with Hycrest crested wheatgrass and forage kochia. Rehabilitate and inter-seed 450 acres in North Pasture (T. 28 S., R. 33 E., Section 24; T. 28 S., R. 34 E., Section 19, SW¼, Section 30, NW¼ and SW¼SE¼ and NE¼S½) by reseeding on toe slopes with bluebunch wheatgrass, Hycrest crested wheatgrass, and forage kochia.

c. Skidoo Spring Water Development, using overflow from an existing trough in South Pasture and run a pipe for 1-mile north to another trough. The pipe would be buried in a trench that would disturb an area 3 to 4 feet wide by 1-mile in length. Trenched area would be rehabilitated with crested wheatgrass and forage kochia, which is approximately one-half acre in size.

d. Smyth Creek Exclosure Gap Fence, would be constructed primarily upstream of the confluence between Frog Creek and Smyth Creek where access locations have been identified or are perceived to occur. Gaps downstream are minimal or do not occur, but gap fences would be constructed if probable access is identified.

e. Inter-seed two medusahead-infested areas, with native (bluebunch wheatgrass and basin wildrye) and nonnative (Hycrest crested wheatgrass and forage kochia) plant species in South Big Hill Pasture (130 acres) and North Big Hill Pasture (170 acres). Temporarily remove livestock and wild horses two growing seasons following seeding to allow plant establishment.

f. Treat medusahead rye infestations, in Happy Valley Allotment in the fall season using Plateau (Imazapic) at 6 oz/acre. Incorporate all pertinent Standard Operating Procedures and Mitigating Measures from the October 2010 Vegetation Treatments Using Herbicides on BLM Land in Oregon Final Environmental Impact Statement/Record of Decision (FEIS/ROD) (Appendix 2 of the attached Happy Valley AMP/EA).

B. Monitoring by BLM staff in coordination with the livestock operator of the success in achieving allotment-specific resource objectives would take place following implementation.

FINDING OF NO SIGNIFICANT IMPACT

Consideration of the Council on Environmental Quality (CEQ) criteria for significance (40 CFR 1508.27), both with regard to context and intensity of impacts, is described below:

Context

The Proposed Action would occur in Happy Valley Allotment and would have local impacts on affected interests, lands, and resources similar to and within the scope of those described and considered in the Three Rivers Proposed Resource Management Plan (PRMP)/FEIS), 1991, and the Andrews Management Unit (AMU)/CMPA PRMP/FEIS, 2004. There would be no substantial broad societal or regional impacts not previously considered in the PRMPs/FEISs. The actions described represent anticipated program adjustments complying with the Three Rivers RMP/ROD and CMPA ROD/RMP, and implementing a change in livestock grazing management and range improvements is within the scope and context of these documents.

Intensity

The CEQ's ten considerations for evaluating intensity (severity of effect):

1. *Impacts that may be both beneficial and adverse.* The EA considered potential beneficial and adverse effects. None of the effects are beyond the range of effects analyzed in the Three Rivers PRMP/FEIS and CMPA ROD/RMP, to which the EA is tiered.

Soils and Biological Soil Crusts (BSCs): The new grazing rotation would provide key forage plants the opportunity to grow, store carbohydrates, and reseed in each pasture. This would decrease the risk of wind and water erosion by maintaining a healthy vegetative component to the allotment leading to more stable soils and BSCs. The overall objectives of the proposed range improvements would lead to more stable soils and BSCs within the allotment.

Upland Vegetation: The Proposed Grazing Management Schedule would provide a graze, defer, and rest rotation for upland vegetation within Happy Valley Allotment. The new grazing rotation would provide key forage plants the opportunity to grow, store carbohydrates, and reseed in each pasture. This would result in an increased upland and ecological trend for this allotment and for areas that did not meet standards or that are at risk. Proposed range improvements would increase perennial vegetative diversity and ground cover for both native and nonnative communities. Healthier perennial plant communities are more resistant to the invasion of annual exotic grasses such as medusahead.

Wetlands, Riparian Zones, Water Quality, and Fisheries: All public streams within the allotment are either currently excluded from livestock and wild horses, or are proposed for exclusion under the Proposed Action. Therefore, proposed livestock management would have no affect to riparian vegetative communities, fisheries or water quality. Removal of livestock and wild horses in Frog Creek would allow deep rooted, hydric herbaceous riparian vegetation to establish and greater bank stability, increased shading and water storage/retention would be expected.

Noxious Weeds and Invasive Nonnative Plant Species: Periodic growing season rest from livestock grazing would help maintain functioning, vigorous, occupied plant communities' resistance to noxious weed introduction and spread. Range improvement projects designed to moderate livestock and wild horse congregation and help spread animals on the landscape would reduce disturbance and, therefore, reduce opportunities for noxious weed introduction and spread. Range improvements would also help spread horse use across the landscape, reducing concentrations and impacts from horses, contribute to enhancing desirable plant communities, and thus lessen opportunities for weed introduction and spread. Herbicide treatments using Plateau at 6 oz/acre in the fall would have low risk to non-target vegetation.

Wildlife: The proposed grazing strategy would continue to allow for maximum potential growth of herbaceous vegetation on 40 to 50 percent of the allotment each year by deferment or rest. Proposed range improvement projects would increase wildlife habitat by improving riparian systems and upland vegetative communities, and reducing medusahead. Proposed range improvement project "b" (brush mowing treatments) would reduce sagebrush cover important for wildlife habitat, but would be offset by the subsequent follow-up seeding with a mixture of bluebunch wheatgrass, crested wheatgrass, and forage kochia.

This seed mixture would provide a more stable fire resistant and resilient plant community from converting to an annual grassland.

Migratory Birds: The proposed grazing strategy would continue to allow for maximum potential growth of herbaceous vegetation on 40 to 50 percent of the allotment each year by deferment or rest. Turnout in the lower elevation pastures would typically be delayed about 2 weeks compared to the current grazing schedule, which would be beneficial to ground nesting species by reducing trampling and loss of screening cover around nests during early season use. Proposed range improvement projects would improve migratory bird habitat within riparian systems and upland vegetative communities, and reduce medusahead. Proposed range improvement project "b" (brush mowing treatments) would reduce sagebrush cover. This effect would be offset by the subsequent follow-up seeding with a mixture of bluebunch wheatgrass, crested wheatgrass, and forage kochia. This seed mixture would provide a more stable fire resistant and resilient plant community from converting to an annual grassland.

Special Status Species (SSS): The allotment provides habitat for greater sage-grouse, an SSS, and effects from the proposed grazing strategy would allow for maximum potential growth of herbaceous vegetation especially in Government and Deep Creek Pastures that support nesting near and around the Dollar Lake lek. Livestock grazing would occur after the critical nesting and early brood-rearing period for sage-grouse in these two pastures. There would be no effects from proposed range improvement projects to sage-grouse because there are no projects in or near the Dollar Lake lek and projects are designed to improve vegetative communities beneficial to sage-grouse.

Redband trout, an SSS, are present in Smyth and Frog Creeks. Proposed grazing management and range improvements exclude livestock and wild horses in Smyth Creek and around Frog Creek improving fish habitat by increasing hydric herbaceous riparian vegetation, bank stability, shading and water storage/retention, and instream structure.

Livestock Grazing Management: There would be no changes in the proposed livestock grazing management to livestock numbers and permitted use dates. Active preference would remain the same. Proposed range improvements would have effects to livestock that include water developments would increase distribution, restoring vegetative communities to desirable native and nonnative species would increase forage quantity and quality, and treating medusahead-invaded sites would reduce the risk of conversion to homogenous invasive annual grassland. Temporary removal of livestock for two growing seasons during the implementation of range improvement project "e" would be a short-term effect while treated sites are rehabilitated and rested. However, following the period of rest livestock would be authorized to use these pastures with improved forage and reduced medusahead.

American Indian Traditional Practices: None of the alternatives advocated increased grazing in the allotment. Proposed range developments are site-specific and may be within areas of importance to the Burns Paiute Tribe. Consultation with the Tribal Council concerning these specific projects and areas surrounding them would occur prior to project implementation.

Cultural Resources: Under the Proposed Action Alternative, impacts to cultural resources would be negligible by grazing management and range improvement projects except in existing and potential new congregation areas that might arise near proposed range developments. All range improvement projects would be inventoried prior to construction or implementation, and the best method to minimize or eliminate effects to nearby cultural resources would be implemented.

Kiger Mustang ACEC and HMAs: Proposed livestock grazing management would rest either North Big Hill or South Big Hill Pastures every other year in a graze/defer/rest rotation. This would provide periods of complete rest from livestock use, and reduce potential competitive relations such as dietary and/or behavioral overlap between cattle and wild horses. Temporary removal of wild horses for two growing seasons during the implementation of range improvement project "e" would be a short-term effect while treated sites are rehabilitated and rested. However, following the period of rest wild horses would be returned to each pasture with improved habitat and reduced medusahead.

Recreation and Visual Resources: No changes to the types of recreation opportunities present in the project area would occur. Visual resources could be temporarily altered during herbicide treatments of medusahead infestations. However, methods would have low risk to established desirable vegetation that would enhance visual resources following treatments.

Social and Economic Values: Providing for sustainable grazing management that improves habitat conditions for wildlife would, in turn, increase economic opportunities and foster more desirable social opportunities such as hunting, wildlife and wild horse viewing, and other outdoor recreational practices.

2. *The degree to which the Proposed Action affects public health or safety.* No aspect of the Proposed Action or alternatives would have an effect on overall public health and safety.

3. *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.* There are no unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, or wild and scenic rivers. The one exception is the allotment is part of the National Landscape Conservation System identified as the CMPA and is considered an ecologically critical area. There are no proposed range improvement projects or changes to the permit's terms and conditions of the Happy Valley Allotment that is within the CMPA.

4. *The degree to which effects on the quality of the human environment are likely to be highly controversial.* Controversy in this context means disagreement about the nature of the effects, not expressions of opposition to the Proposed Action or preference among the alternatives. No unique or appreciable scientific controversy has been identified regarding the effects of the Proposed Action or alternatives.

5. *Degree to which possible effects on the human environment are highly uncertain or involve unique or unknown risks.* The analysis has not shown there would be any unique or unknown risks to the human environment nor were any identified in the Three Rivers PRMP/FEIS and AMU/CMPA PRMP/FEIS to which this proposal is tiered.

6. *Degree to which the action may establish a precedent for future actions with significant impacts or represents a decision in principle about a future consideration.* This project neither establishes a precedent nor represents a decision in principle about future actions as livestock grazing and rangeland improvement projects are ongoing and routine management actions.

7. W*hether the action is related to other actions with individually insignificant but cumulatively significant impacts.* The environmental analysis did not reveal any cumulative effects beyond those already analyzed in the Three Rivers PRMP/FEIS and AMU/CMPA PRMP/FEIS which encompasses Happy Valley Allotment. The EA described the current state of the environment (Affected Environment by resource, Chapter III) which included the effects of past actions. Continued livestock grazing, recreation activities including fishing and hunting, Five Creeks Rangeland Restoration Project EA (OR-06-027-022), and North Steens Ecosystem Restoration Project ROD 2007 are known Reasonably Foreseeable Future Actions. Five Creeks Rangeland Restoration Project has and will continue to utilize various methods of prescribed fire and mechanical treatments to reduce western juniper densities in two dominant vegetative communities: low sagebrush flats, mountain big sagebrush-bunchgrasses, and riparian communities. Mountain mahogany communities are identified and treated separately to preserve the existing population.

8. *Degree to which the action may adversely affect districts, sites, highways, structures or objects listed in or eligible for listing in the National Register of Historic Places.* There are no features within the project area listed or eligible for listing in the National Register of Historic Places.

9. *The degree to which the action may adversely affect a threatened or endangered species or its habitat.* There are no known threatened or endangered species or their habitat affected by the Proposed Action or alternatives.

10. *Whether an action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.* The Proposed Action and alternatives do not threaten to violate any law imposed for the protection of the environment. The Proposed Action is in compliance with the Three Rivers RMP and CMPA RMP, which provide direction for the protection of the environment on public lands.

On the basis of the information contained in the EA and all other information available to me, it is my determination that:

1. The implementation of the Proposed Action or alternatives will not have significant environmental impacts beyond those already addressed in the Three Rivers PRMP/FEIS (*September 1991*) and AMU/CMPA PRMP/FEIS (*2004*);

2. The Proposed Action and alternatives are in conformance with the Three Rivers RMP/ROD and CMPA RMP/ROD;

3. There would be no adverse societal or regional impacts and no adverse impacts to affected interests; and

4. The environmental effects against the tests of significance found at 40 CFR 1508.27 do not constitute a major Federal action having a significant effect on the human environment.

Therefore, an EIS is not necessary and will not be prepared.

_____ _____

Richard Roy Date
Three Rivers Resource Area Field Manager

HAPPY VALLEY ALLOTMENT MANAGEMENT PLAN

ENVIRONMENTAL ASSESSMENT
DOI-BLM-OR-B050-2009-0053-EA

Three Rivers Resource Area
Bureau of Land Management
Burns District Office
28910 Hwy 20 West
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Date of Preparation
June 24, 2011

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HAPPY VALLEY ALLOTMENT MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT
OR-B050-2009-0053-EA

CHAPTER I: PURPOSE OF AND NEED FOR ACTION

A. Introduction

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of grazing management for Happy Valley Allotment. This EA is a site-specific analysis of potential impacts that would result with the implementation of the Proposed Action or another analyzed alternative. The EA assists the Bureau of Land Management (BLM) in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), in making a determination as to whether any "significant" impacts would result from the analyzed actions.

The BLM proposes to renew grazing permit #3602315 for Happy Valley Allotment #5309, and modify grazing management to help achieve Standards for Rangeland Health and Guidelines for Livestock Grazing Management. Happy Valley Allotment is located approximately 50 air miles southeast of Burns, Oregon (Map A – Vicinity). This allotment is 19,362 acres, and contains 16,785 acres of BLM-managed land and 2,577 acres of private land. The allotment consists of ten pastures and two riparian exclosures (Map B – Land Status and Special Management Areas). The Three Rivers Resource Management Plan (RMP) September 1992 allocated carrying capacity in this allotment at 2,522 Animal Unit Months (AUMs) for all demands. Of this estimate for carrying capacity 2,107 AUMs were allocated to livestock, 132 AUMs to wild horses, and 117 AUMs to wildlife. The season of use for livestock in this allotment is from April 1 through October 15. Also, there are 250 AUMs of exchange of use from the private land base. Pastures in this allotment are used in a grazed and defer system. There is one grazing permit (#3602315) for this allotment.

In 2005, grazing management within Happy Valley Allotment from 1995 to 2004 was analyzed through a formal interdisciplinary evaluation process. This evaluation identified which resource objectives were or were not being achieved (Tables 1 and 2).

Table 1: Pastures and Riparian Exclosures in this Allotment where Standards were not Achieved

Pasture/Exclosure	Standards[1] Not Achieved	Causal Factors	Comments
West Field Pasture	1, 3	Livestock grazing during the critical period of plant growth, droughty conditions, brush encroachment, and age of crested wheatgrass seedings.	Since the 2005 Evaluation adaptive management was administered and implemented a graze and defer rotation. This has resulted in an upward trend in crested wheatgrass vigor and seedling establishment.
Riddle Creek Exclosure	4, 5	Upstream conditions outside of this allotment and not current management are potential causal factors.	Water temperatures exceed Oregon Department of Environmental Quality's (ODEQ's) water temperature standard for salmonid fish rearing. Redband trout are present in this creek.
Smyth Creek Exclosure	4, 5-unknown	Upstream conditions outside of this allotment and not current management are potential causal factors.	Smyth Creek temperature trends do not meet ODEQ standard. Redband trout are present in this creek.
Hay Meadow Pasture	4, 5	Upstream conditions outside of this allotment and not current management are potential causal factors.	Water temperatures exceed ODEQ water temperature standard for salmonid fish rearing. Redband trout are present in this creek.

1: 1) Watershed Function – Uplands, 2) Watershed Function – Riparian, 3) Ecological Processes, 4) Water Quality, and 5) Native, Threatened and Endangered, and Locally Important Species.

Table 2: Pastures in this Allotment where Standards and Guidelines were Achieved

Pasture	Standards[1] Achieved	Standards[1] At Risk	Comments
Tank	1, 3, 5 2, 4 = N/P[2]		
North Field	1, 3, 5 2, 4 = N/P[2]	1, 5	Bare ground areas in low elevation Wyoming big sagebrush native pasture mixed with crested wheatgrass on toe slopes. Mule deer winter range forage quality.
Fisher Field	1, 3, 5 2, 4 = N/P[2]		
North Big Hill	1, 3, 5 2, 4 = N/P[2]	1, 3, 5	Medusahead is present and is increasing in coverage. Concern for wild horse use area that indicates high intensity, frequency and duration of year-round grazing (Map H).
South Big Hill	1, 2, 3, 4, 5	1, 2, 3, 4, 5	Concern for Frog Creek Riparian condition that is Functional – At Risk and Water Quality. Medusahead is present and is increasing in coverage. Concern for wild horse use area that indicates high intensity, frequency and duration of year-round grazing (Map H).
South	1, 3, 5 2, 4 = N/P[2]	1, 3, 5	Medusahead is present.
Government Field	1, 3, 5 2, 4 = N/P[2]		
Deep Creek	1, 3, 5 2, 4 = N/P[2]		

1: 1) Watershed Function – Uplands, 2) Watershed Function – Riparian, 3) Ecological Processes, 4) Water Quality, and 5) Native, Threatened and Endangered, and Locally Important Species.
2: Not Present

Happy Valley Allotment along with Smyth-Kiger Allotment is part of Kiger Wild Horse Herd Management Area (HMA) and Kiger Mustang Area of Critical Environmental Concern (ACEC) (Map B – Happy Valley Allotment Land Status and Special Management Areas). Appropriate Management Level (AML) for this HMA is 51 (612 AUMs) minimum to 82 (984 AUMs) maximum animals. The Three Rivers and Steens Mountain Cooperative Management and Protection Area (CMPA) RMPs allocate 132 AUMs per year for the AML in Happy Valley Allotment, which is equivalent to 11 horses.

Within Happy Valley Allotment, Government and Deep Creek Pastures lie within the Steens Mountain CMPA. The approximate acreage in these two pastures is 2,183 public land acres and 1,724 private land acres. See Map B – Happy Valley Allotment Land Status and Special Management Areas for the Steens Mountain CMPA boundary and Map D – Happy Valley South Range Improvements.

Four pastures within Happy Valley Allotment are part of the Five Creeks Rangeland Restoration Project EA (OR-06-027-022). These pastures include Government, Deep Creek, South, and South Big Hill. The purpose of the Five Creeks project is to remove juniper from sagebrush plant communities to maintain or enhance the habitat values of those communities for sage-grouse and other sagebrush obligate species and to maintain or increase the diversity and resilience of sagebrush plant communities.

This Allotment Management Plan (AMP)/EA analysis addresses issues from the 2005 Happy Valley Allotment Evaluation. The AMP/EA is tiered to the September 1991 Three Rivers Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS), and the August 2004 Andrews Management Unit/Steens Mountain CMPA PRMP/FEIS (2004 Andrews/Steens PRMP/FEIS) as the Happy Valley Allotment falls within both planning units.

B. Purpose and Need for Action

1. Purpose and Need for Action:

The purpose of the action is to address livestock grazing management within Happy Valley Allotment to make significant progress[1] toward achieving the Watershed Function – Uplands (Standard 1) and Ecological Processes (Standard 3) Standards not achieved within West Field Pasture (Table 1); to continue to achieve Standards at risk of achievement in North Field, Fisher Field, North Big Hill, South Big Hill, and South Pastures (Table 2); and to consider renewal of the Term Grazing Permit.

[1] **Significant Progress:** Used in reference to achieving a standard as outlined in the Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the States of Oregon and Washington (1997). The use of the word "significant" in this document does not meet the Council on Environmental Quality's (CEQ) definition of the word.

The need arises from the 2005 allotment evaluation concluding Watershed Function – Uplands and Ecological Processes Standards were not being achieved in West Field Pasture due to livestock grazing during critical periods of plant growth. Drought conditions and the age and condition of crested wheatgrass seedings were also identified as factors for not achieving Standards 1 and 3. Water Quality (Standard 4) and Native, Threatened, Endangered, and Locally Important Species (Standard 5) Standards were also not achieved in Riddle Creek Exclosure, Smyth Creek Exclosure, and Hay Meadow Pastures due to upstream conditions outside Happy Valley Allotment affecting water temperature for redband trout. Management of private lands is outside BLM's discretion, so no management strategy is proposed on private lands. Rangeland Health Standards are at risk due to encroaching brush into crested wheatgrass seedings and the increasing coverage of medusahead rye infestations. Chemicals available to BLM in the past for treatment of medusahead rye were ineffective, and infestations and bare ground areas in low elevation are affecting mule deer winter range forage quality. Year-round wild horse use in South Big Hill and North Big Hill Pastures was also identified as a factor affecting Standards at risk; however, no new horse management strategies, such as gathers and adjustments to AML, are proposed as they would be outside the scope of this analysis. Finally, BLM has a responsibility to respond to an external request to issue a new Term Grazing Permit associated within Happy Valley Allotment expiring in 2016. Permit issuance would be consistent with grazing regulations at 43 Code of Federal Regulations 4100, to manage the public lands for multiple-use and sustained yield under the Taylor Grazing Act (43 U.S.C 315, 1934), the *Federal Land Policy and Management Act of 1976*, and the *Public Rangelands Improvement Act of 1978*, Three Rivers RMP and the Steens Mountain CMPA RMP. Livestock grazing is identified as a use of the public land and is to be conducted in a manner which would meet multiple-use and sustained yield objectives.

2. AMP Goals and Objectives:

- Reestablish perennial nonnative and native vegetation in the West Field and North Pastures;
- combat medusahead invasion in South Big Hill and North Big Hill Pastures,
- establish more grazing tolerant perennial vegetation in horse use areas that receive high frequency, intensity and duration year-round grazing;
- make changes in the livestock management that would provide growing season rest for plants;
- exclude use or change season of use by livestock and wild horses within Frog Creek's riparian corridor,
- establish vegetation in crested seedings and other disturbed low elevation sites that would provide winter browse for mule deer a Locally Important Species.

3. Three Rivers RMP, September 1992 Goals and Objectives:

- "to improve surface water quality standards….established by the DEQ…." Chapter 2, Page 4; Appendix 9, Page 55
- "protect special status species or its habitat from BLM-authorized actions; improve and maintain riparian aquatic habitat in good or better habitat condition" Chapter 2, Pages 33-36, 96 and 137-141; Appendix 9, Page 55-56
- "adjust allotment management including levels and areas of authorized use, seasons of use and grazing system as required by ACEC Management Plan" Chapter 2, Pages 33 and 137-141; Appendix 9, Page 55-56
- "maintain healthy populations of wild horses and burros at appropriate management levels which would achieve a thriving natural ecological balance." Chapter 2, Pages 33, 43-45 and 137-141; Appendix 9, Page 55-56
- Manage for deer winter range that occurs in this allotment. Chapter 2, Pages 66, 69, 89; Appendix 9, Page 56

4. CMPA RMP, August 2005, Goals and Objectives (only includes Deep Creek and Government Field Pastures):

- "Restore, protect, and enhance the diversity and distribution of desirable vegetation communities…. Provide….continued existence and normal function in nutrient, water, and energy cycles. Manage big sagebrush cover….on native rangelands to meet the life history requirements of sagebrush dependent wildlife." Appendix C – 10 *Vegetation*
- "Provide for a sustained level of livestock grazing consistent with other resource objectives…." Appendix C – 11 *Grazing Management*
- "Manage upland wildlife habitats to ensure that the necessary forage, water, cover, structure, and security are available on public land." Appendix C – 10 *Wildlife Habitat*
- "Manage public land to maintain, restore, or enhance populations and habitats of Special Status animal species." Appendix C – 10 *Special Status Species*
- "Maintain and manage wild horse herds in established HMAs at AMLs to ensure or enhance a thriving natural ecological balance between wild horse populations, wildlife, livestock, vegetation resources, and other resource values." Appendix C – 11 *Wild Horses*

C. <u>Decision to Be Made</u>

The BLM will decide whether or not to renew the Term Grazing Permit, and if so, under what terms and conditions; and whether or not to implement range improvements designed to make progress in achieving and/or maintaining Rangeland Health Standards and Guidelines.

D. Conformance with Land Use Plans

The Proposed Action and alternatives are in conformance with the Three Rivers RMP/Record of Decision (ROD) (September 1992) and the Steens Mountain CMPA RMP/ROD (August 2005), even though they are not specifically provided for, because they are clearly consistent with the goals and objectives outlined under the Purpose and Need.

E. Consistency with Laws, Regulations and Policies

The Proposed Action and alternatives described below are in conformance with the following documents, which direct and provide the framework for management of BLM lands within Burns District:

- Taylor Grazing Act (43 U.S.C. 315), 1934
- NEPA (42 U.S.C. 4321-4347), 1970
- Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1701), 1976
- Public Rangelands Improvement Act (43 U.S.C. 1901), 1978
- August 12, 1997 Standards for Rangeland Health and Guidelines for Livestock Management for Public Lands Administered by the BLM in the States of Oregon and Washington
- 1998 Burns District Noxious Weed Management Program EA (OR-020-98-05)
- Greater Sage-grouse and Sagebrush-Steppe Ecosystems Management Guidelines (BLM-2000)
- BLM National Sage-Grouse Habitat Conservation Strategy (2004)
- Greater Sage-grouse Conservation Assessment and Strategy for Oregon, August 2005
- 2007 Steens Mountain Travel Management Plan (EA OR-05-027-021)
- State, local, and Tribal laws, regulations, and land use plans
- Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States ROD 2007
- Vegetation Treatments Using Herbicides on BLM Lands in Oregon ROD 2010

F. Identification of Issues

No response was received from agencies or individuals of the interested public consulted through a letter by the BLM to provide an opportunity to participate in the development of this AMP and EA initiated September 25, 2010 (Chapter IV Section B). The BLM asked for replies by October 28, 2010.

G. Issues Considered but Not Analyzed Further

The proposed project area, Happy Valley Allotment lies within a portion of Riddle Creek citizens' Proposed Wilderness Study Area (PWSA) submitted in September 2002.

The BLM's 1980 wilderness inventory decision found wilderness character not present on BLM-administered lands within the Happy Valley Allotment.

Wilderness Inventory Maintenance (WIM) assessment was completed, in 2003 - 2010, by a BLM Interdisciplinary Team (IDT) that covers Happy Valley Allotment. The IDT used current field data along with the citizens' PWSA data and determined that there was no wilderness character present in the project area.

The Happy Valley Allotment lies within two WIM units: Riddle Creek (20,293 acres), and Smyth Creek (6,582 acres). Both WIM units met the size criteria unit, but did not meet naturalness because the imprint of man is substantially noticeable.

CHAPTER II: ALTERNATIVES, INCLUDING THE PROPOSED ACTION

Alternatives I through VI have been fully analyzed in Chapter III of this AMP/EA. Following the public review period for this document a proposed decision would be issued by the Field Manager that may choose to proceed with any one of the alternatives analyzed or a combination of portions of multiple alternatives.

A. Actions Common to All Alternatives

1. Kiger Herd Management Area, Herd Management Area Plan, and Area of Critical Environmental Concern:

   The Happy Valley Allotment is part of the Kiger HMA and ACEC. This AMP does not propose to change wild horse management in the HMA/ACEC. Wild horses are discussed to show what an important component they are to management of the allotment. Regardless of the decision following this EA, wild horses would be managed in compliance with the Kiger HMA and ACEC plans. The planned 2011 and future wild horse gathers from the HMA or changes the HMA Plan (HMAP) or ACEC management plan would be addressed under separate NEPA and have their own decisions.

   a. Gathering to Maintain Horse Numbers within AML in order to maintain a natural ecological balance, achieve the Standards for Rangeland Health and achieve resource objectives outlined in the AMP and RMP, horse numbers must be maintained at 132 AUMs in North Big Hill and South Big Hill Pastures within the Happy Valley Allotment. Gathers should be planned when horse numbers are approaching or would exceed the AML for the RMP and HMA (1996 Riddle/Kiger HMAP) or when monitoring data (census, utilization, rangeland trend data, use supervision, etc.) indicate ecological balance would be compromised. "The number of horses to be removed (excess animals) are those animals that exceed the AML" (1996 Riddle/Kiger HMAP).

In order to maintain the horse population within the AML, a typical gather cycle would occur every 3 to 4 years to perpetuate the characteristics of the Kiger horse. Animals would be selected based upon their dun factor color and conformation characteristics and returned to the Kiger HMA. The 1996 Riddle/Kiger HMAP states, "to ensure that the low end of AML has been attained in the HMA a census should be conducted immediately after a gathering and on the second year following a gathering to verify numbers and begin planning for the next gather."

Returning horses to the range would be coordinated by the Field Manager, Wild Horse Specialist, and Range Management Specialist for the HMA to encourage improved distribution throughout the HMA and promote ecological balance. Small bands selected by sex ratio and color/conformation characteristics would be returned to North Big Hill and South Big Hill Pastures within the Kiger HMA.

b. Gate Management is the responsibility of the livestock grazing permittee. Gates along the boundary of Kiger HMA are to stay closed year-round. Interior gates within the Happy Valley Allotment portion of the Kiger HMA would be managed to contain and control livestock during the grazing season. Interior gates to private pastures would remain closed year-round. Interior gates between BLM-managed North Big Hill and South Big Hill Pastures would remain open after livestock are gathered in order to aid in the movement and distribution of wild horses.

2. Five Creeks Rangeland Restoration Project EA (OR-06-027-022):

The EA (OR-06-027-022) analyzed the Five Creeks Rangeland Restoration Project. The final decision was issued on October 16, 2006. Implementation began in 2007 and continues. It is not part of the Proposed Action within this AMP/EA. However, effects of implementation are analyzed in this document as a current and foreseeable future project. Regardless of Five Creeks Project, management of livestock grazing and wild horses within Happy Valley Allotment requires adjustments with range improvement projects and management to improve distribution and to manipulate the time of use in a progressive manner to achieve Standards and resource objectives.

3. Monitoring:

Monitoring would be conducted for the life of the AMP by BLM staff in coordination with interested parties. Pace 180° methodology (1984 Technical Reference (TR) 4400-4) and permanent photo points would be used to measure the relative frequency of occurrence of key forbs, shrubs, and perennial grass species, to assess trend in rangeland condition. Riparian monitoring includes Proper Functioning Condition (PFC), photo points 2 to 5-year intervals, and temperature thermographs (10-year intervals). Upland trend data and riparian/water quality data are collected and analyzed for the Happy Valley Allotment on 5-year intervals. Annual utilization studies for each pasture grazed by livestock along with multiple-use supervision reports would be collected by BLM staff. The Key Forage Plant Method would be used to measure utilization in each pasture. Target utilization levels for key forage plant species are shown in Table 3 below. Soil Surface Factor methodology would be used to measure soil stability and Observed Apparent Trend would be assessed at each upland trend plot. During each allotment visit monitoring for noxious weed establishment would be occurring as well as observations of overall rangeland condition.

Table 3: Key Species and Target Utilization Levels for Pastures within this Allotment

Pasture	BLM Acres	Key Species	Utilization Target %
West Field	2,229	Crested Wheatgrass (*Agropyron cristatum*)	60
Tank	1,071	Bluebunch Wheatgrass (*Pseudoroegneria spicata*)/ Thurber's Needlegrass (*Achnatherum thurberianum*)	50
Fisher	614	Crested Wheatgrass	60
Hay Meadow	80	Squirreltail (*Elymus elymoides*)	50
North	1,580	Bluebunch/Thurber's Needlegrass	50
South	2,227	Bluebunch/Idaho Fescue (*Festuca idahoensis*)	50
North Big Hill	2,339	Bluebunch/Squirreltail	50
South Big Hill	3,553	Bluebunch/Idaho Fescue	50
Government	1,388	Idaho Fescue	50
Deep Creek	795	Idaho Fescue	50

4. Adaptive Management:

Based upon predetermined resource objectives (Allotment Specific Resource Objectives in Chapter I: Section B, Standards for Rangeland Health) and monitoring would be used to provide flexibility in grazing management. "Adaptive management….is about taking action to improve progress toward desired outcomes." (www.doi.gov/initiatives, 2007). Knowing that uncertainties exist in managing for sustainable ecosystems, changes to the proposed rotation may be authorized for reasons such as, but not limited to:

a. Adjust the rotation/timing of grazing based on previous year's monitoring and current year's climatic conditions.
b. Drought causing lack of available water in certain areas originally scheduled to be used.
c. Utilization levels from wild horses in North Big Hill and South Big Hill Pastures.
d. Change in use periods to balance utilization levels per pasture.

B. Alternative I: No Action

The No Action Alternative would renew the existing livestock grazing permit (#3602315) in the Happy Valley Allotment for the current grazing permittee with the same terms and conditions. A 10-year term livestock grazing permit would be issued that continues current grazing management during the permitted season of use from April 1 through October 15 (Table 4). A 4-year rotation for crested wheatgrass seedings would still be the grazing schematic that occurs during the critical growth period for this grass. Permitted use would remain at 2,107 AUMs on public land. Under the No Action Alternative, no range improvement actions would be implemented.

Table 4: Current General Livestock Grazing Management
(4-Year Rotation)

Year	Pasture Number	Pasture Name	Approximate Cow Numbers	Approximate Use Dates	Approximate AUMs	Season of Use (Grazing Treatment Description)
1	6	Tank	Herd A - 160	04/10 – 04/23	74	Graze
1	5	West Field	Herd A - 305	04/24 – 06/10	481	Graze
1	8	North Big Hill	Herd A - 305	06/11 – 07/31	511	Graze
1	3	Government Field	Herd A - 305	08/01 – 08/16	160	Defer
1	4	Deep Creek	Herd A - 305	08/17 – 09/30	451	Defer
1	7	Fisher Field	Herd B - 106	04/01 – 05/06	125	Graze
1	1	North	Herd B - 106	05/07 – 09/15	460	Graze
1	12	Hay Meadow	8	04/01 – 10/15	50	
1	2	South	0	N/A	0	Rest
1	9	South Big Hill	0	N/A	0	Rest
2	5	West Field	Herd A - 160	04/01 – 04/23	121	Graze
2	5	West Field	Herd A - 305	04/24 – 05/15	221	Graze
2	6	Tank	Herd A - 305	05/16 – 05/25	100	Graze
2	5	West Field	Herd A - 305	05/26 – 06/10	160	Graze
2	8	North Big Hill	Herd A - 305	06/11 – 07/31	511	Graze
2	4	Deep Creek	Herd A - 305	08/01 – 09/14	451	Defer
2	3	Government Field	Herd A - 305	09/15 – 09/30	160	Defer
2	7	Fisher Field	Herd B - 106	04/01 – 05/05	122	Graze
2	2	South	Herd B - 106	05/06 – 09/15	463	Graze
2	12	Hay Meadow	8	04/01 – 10/15	50	

Year	Pasture Number	Pasture Name	Approximate Cow Numbers	Approximate Use Dates	Approximate AUMs	Season of Use (Grazing Treatment Description)
2	9	South Big Hill	0	N/A	0	Rest
2	1	North	0	N/A	0	Rest
3	5	West Field	Herd A - 160	04/01 – 04/23	121	Graze
3	5	West Field	Herd A - 305	04/24 – 06/01	391	Graze
3	6	Tank	Herd A - 305	06/02 – 06/10	90	Graze
3	9	South Big Hill	Herd A - 305	06/11 – 07/31	511	Graze
3	3	Government Field	Herd A - 305	08/01– 08/16	160	Defer
3	4	Deep Creek	Herd A - 305	08/17 – 09/30	451	Defer
3	7	Fisher Field	Herd B - 106	04/01 – 05/06	125	Graze
3	1	North	Herd B- 106	05/07 – 09/15	460	Graze
2	12	Hay Meadow	8	04/01 – 10/15	50	
3	8	North Big Hill	0	N/A	0	Rest
3	2	South	0	N/A	0	Rest
4	6	Tank	Herd A - 160	04/01 – 04/23	121	Graze
4	5	West Field	Herd A - 305	04/24 – 06/10	481	Graze
4	9	South Big Hill	Herd A - 305	06/11 – 07/31	511	Graze
4	4	Deep Creek	Herd A - 305	08/01– 09/14	451	Defer
4	3	Government Field	Herd A - 305	09/15 – 09/30	160	Defer
4	7	Fisher Field	Herd B - 106	04/01 – 05/06	125	Graze
4	2	South	Herd B - 106	05/07 – 09/15	460	Graze
4	12	Hay Meadow	8	04/01 – 10/15	50	
4	1	North	0	N/A	0	Rest
4	8	North Big Hill	0	N/A	0	Rest

AUMs includes 250 AUMs of Exchange of Use (Private Land intermixed with Public Land) = 2,107+250 = 2,357

C. Alternative II: Proposed Action - Management Changes, Season of Use Change, and Project Development

The Proposed Action was designed by a BLM IDT to make progress toward achieving Standards determined as not achieved with livestock as a causal factor and standards at risk in the 2005 Happy Valley Allotment Evaluation. It was also designed to achieve Happy Valley Allotment resource objectives brought forth and revised from the 2005 Happy Valley Allotment Evaluation (Chapter VI, Section A - G).

The Proposed Action would include the issuance of grazing permit #3602315 in Happy Valley Allotment for 10 years. The permit would be for 2,107 active use AUMs of livestock grazing on public land as outlined in Table 5. The term permit would add this AMP as a term and condition.

To achieve Standards for Rangeland Health, meet resource objectives and conform to Guidelines for Livestock Grazing Management; the proposed management actions are described in detail as follows:

1. Livestock Grazing:

    a. Livestock grazing management is designed and would be authorized to provide periodic growing season rest for upland plant species. Grazing management in riparian areas would be designed to limit or remove grazing to support adequate vegetation that maintains channel and bank stability. Removal of livestock and wild horse grazing would be implemented on Frog Creek to reduce continuous grazing and control the time of use on all public land pastures in the Happy Valley Allotment. Use periods per pasture may vary annually in order to provide recommended rest periods described in Table 5 (below).

    b. Flexibility in grazing management within the authorized grazing period of April 1 to October 31 would be authorized to change pasture rotation and time of use to achieve resource objectives. Flexibility is dependent upon the demonstrated stewardship and cooperation of the permittee. Rangeland monitoring is a key component of adaptive management. As monitoring indicates changes in grazing management are needed to achieve resource objectives, they are implemented annually within the specified flexibility working with the permittee. Refer to Appendix A: Grazing Schematic.

Table 5: Proposed General Livestock Grazing Management
(3-Year Rotation)

Year	Pasture Number	Pasture Name	Approximate Cow Numbers	Approximate Use Dates	Approximate AUMs	Season of Use (Grazing Treatment Description)
1	1	North	Herd A - 350	04/10 – 05/11	368	Graze
1	2	South	Herd A - 350	05/12 – 06/12	368	Graze
1	9	South Big Hill	Herd A - 350	06/13 – 07/14	368	Graze
1	3	Government Field	Herd A - 350	07/15 – 07/28	161	Defer
1	4	Deep Creek	Herd A - 350	07/29 – 09/08	483	Defer
1	7	Fisher Field	Herd B - 120	04/15 – 05/25	162	Graze
1	6	Tank	Herd B - 120	05/26 – 06/24	118	Graze
1	5	West Field	Herd B - 120	06/25 – 08/09	181	Defer
1	12	Hay Meadow	8	04/01 – 10/15	50	
1	8	North Big Hill	0	N/A	0	Rest
2	5	West Field	Herd A - 350	04/10 – 05/11	368	Graze
2	8	North Big Hill	Herd A - 350	05/12 – 06/14	391	Graze
2	9	South Big Hill	Herd A - 350	06/15 – 07/16	368	Graze
2	4	Deep Creek	Herd A - 350	07/17 – 08/27	483	Defer
2	3	Government Field	Herd A - 350	08/28 – 09/10	161	Defer
2	6	Fisher Field	Herd B - 120	04/15 – 05/20	142	Graze
2	7	Tank	Herd B - 120	05/21 – 06/24	138	Graze
2	1	North	Herd B - 120	06/25 – 08/09	181	Defer
2	12	Hay Meadow	8	04/01 – 10/15	50	
2	2	South	0	N/A	0	Rest
3	1	North	Herd A - 350	04/10 – 05/11	368	Graze
3	8	North Big Hill	Herd A - 350	05/12 – 06/14	391	Graze
3	2	South	Herd A - 350	06/15 – 07/16	368	Graze
3	3	Government Field	Herd A - 350	07/17 – 07/30	161	Defer
3	4	Deep Creek	Herd A - 350	07/31 – 09/10	483	Defer
3	7	Fisher Field	Herd B - 120	04/15 – 05/25	99	Graze
3	6	Tank	Herd B - 120	05/26 – 06/24	209	Graze
3	5	West Field	Herd B - 120	06/25 – 08/09	154	Defer
3	12	Hay Meadow	8	04/01 – 10/15	50	
3	9	South Big Hill	0	N/A	0	Rest

2. Range Improvement Projects:

a. Frog Creek: located in South Big Hill Pasture in T. 29 S., R. 34 E., Sections 33 and 34 and T. 30 S., R. 34 E., Section 4, and flows out of the pasture into Smyth Creek Exclosure in T. 30 S., R. 34 E., Section 4 (Map E).

(1) Build a 65-acre exclosure using 1.5 miles of 4-strand fence below the road and along the north and south rim to prevent wild horse and livestock access. Exclosure fence design would be built to reduce impacts on wild horse and livestock movement, install fence markers to prevent sage-grouse fence strikes, and meet BLM fence parameters.

(2) Install water troughs that would provide adequate water and improve or maintain wild horse and livestock distributions. Water would be piped from upstream into troughs and outflow would be piped back into Frog Creek.

(3) The grazing permittee would be responsible for maintenance of the Frog Creek Exclosure as part of the South Big Hill Pasture boundary.

(4) Material, Equipment and Labor Costs

(a) Fence = $8,000 per mile

(b) Water troughs (pipeline, etc.) or waterhole = $7,000

(c) Total = $19,000

b. Crested Wheatgrass Seedings: Rehabilitate crested seedings and improve late season forage for mule deer winter range and livestock in West Field and North Pastures (Map F). Reduce but not eliminate Wyoming big sagebrush cover.

(1) West Field Pasture: W.M., T. 28 S., R. 33 E., Sections 6, 7, 8, 9, 17, and 18 - part of the Barton Lake Seeding. Within this pasture 940 acres of sagebrush would be treated by using a brush mower. Seed 200 acres with:

(a) Hycrest Crested Wheatgrass – 6 lbs/acre

(b) Forage Kochia – 2 lbs/acre

(c) Material, Equipment and Labor Costs

i) Seed = $5,500

ii) Brush Mower = $51,700

iii) Rangeland Drill = $1,400

iv) Total = $58,600

(2) North Pasture: W.M, T. 28 S., R. 33 E. Section 24, S¼; T. 28 S., R. 34 E., Section 19, SW¼, Section 30, NW¼ and SW¼NE¼ and Section 32, NW¼SE¼ and NE¼S½ - reseed on toe slopes that is part of the Riddle Mountain Burn Seeding #710383. Seed 450 acres with:

(a) Bluebunch Wheatgrass – 3 lbs/acre
(b) Hycrest Crested Wheatgrass – 3 lbs/acre
(c) Forage Kochia – 2 lbs/acre
(d) Material, Equipment and Labor Costs
i) Seed = $13,050
ii) Rangeland Drill = $3,000
iii) Tractor and Labor = $400/day x 4 days = $16,000
iv) Total = $32,050

c. Skidoo Spring Water Development (Map G)

(1) Skidoo Spring Trough: use overflow from existing trough in South Pasture, and run a pipe for 1-mile north that would be buried in a trench. To create a trench for the pipe a ripper tooth mounted on a dozer would be used, which would disturb an area 3 to 4 feet in width by 2 feet in depth by 1-mile in length. There would also be potential ground surface disturbance from the dozer's tracks that would be 10 feet wide and a 6-inch berm after the trench is filled. A 500-gallon trough would be installed on the fenceline between North Big Hill and South Pastures. This would be constructed during the field season and any restrictions such as fire restrictions would apply. The area trenched would be rehabilitated by reseeding with crested wheatgrass and forage kochia, which is approximately one-half acre.

(a) Material, Equipment and Labor Costs
i) Seed = $25
ii) Dozer, Dump Truck, Backhoe and Labor = $4,845
iii) Trough and Fittings = $1,900
iv) Pipe = $6,600
v) Drain Rock = $100
vi) Total = $13,470

d. Smyth Creek Exclosure Gap Fence (Map J)

(1) Gap fences would be constructed by need in locations downstream and upstream of the confluence of Frog Creek and Smyth Creek where access locations have been identified or where perceived access would occur.

(2) This exclosure is part of the boundary for this allotment and maintenance would be the responsibility of the permittee.

e. Inter-seed two medusahead-infested areas with native and nonnative plant species in South Big Hill Pasture (130 acres) and in North Big Hill Pasture (170 acres) using a tractor and rangeland drill. Temporarily remove wild horses and livestock grazing from these two pastures (Map H).

(1) Rest Treatment

(a) South Big Hill – rest two growing seasons by temporarily removing wild horses that would follow the planned gather for 2011. Horses gathered from this specific location would be relocated into the Riddle Mountain HMA or adopted. Livestock would be temporarily removed two growing seasons following seeding.

(b) North Big Hill – rest two growing seasons by temporarily removing wild horses that would follow the planned gather for 2011. Horses gathered from this specific location would be relocated into the Riddle Mountain HMA or adopted. Livestock would be temporarily removed two growing seasons following seeding.

(2) Species would consist of cultivars listed below at a total rate of 9 lbs/acre

(a) Native Plant Seed:

i) Bluebunch wheatgrass – 2 lbs/acre

ii) Basin wildrye – 1 lb/acre

(b) Nonnative Plant Seed:

i) Hycrest Crested Wheatgrass – 4 lbs/acre

ii) Forage Kochia – 2 lbs/acre

(3) Material, Equipment and Labor Costs

(a) Seed = $10,500

(b) Rangeland Drill = $2,025/300 acres

(c) Tractor and Labor = $400/day x 10 days = $4,000

(d) Total = $16,525

f. Treat medusahead rye infestations in Happy Valley Allotment in the fall season using Plateau (Imazapic) at 6 oz/acre. Incorporate all pertinent Standard Operating Procedures (SOPs) and Mitigating Measures from the Vegetation Treatments Using Herbicides on BLM Lands in Oregon ROD (October 2010) (Appendix 2. Pages 457-467).

3. General Project Design Elements for Proposed Range Improvements:

a. Proposed rangeland improvement sites would be surveyed for cultural values prior to implementation. Where cultural sites are found, their condition and National Register eligibility would be evaluated. If determined National Register eligible and under threat of damage, mitigation measures to protect cultural materials would be determined. Mitigation plans would be developed in consultation with the State Historic Preservation Office if necessary. Mitigation measures can include protective fencing, avoidance, surface collection and mapping of artifacts, subsurface testing and complete data recovery (full-scale excavation).

b. Proposed rangeland improvement sites would be surveyed for Special Status plant species prior to implementation. Special Status plant sites would be avoided/protected for each project.

c. Protect Special Status wildlife species (fisheries and wildlife) habitat. Structures or areas with Special Status Species (SSS) habitat value identified during wildlife surveys would be protected during project implementation.

d. No range improvement projects would be constructed within 7.5 miles of known sage-grouse lek sites.

e. The grazing permittees would be responsible for all fence maintenance. Proper fence maintenance would be a stipulation for turnout each year.

f. Proposed range improvement sites would be surveyed for noxious weed populations prior to implementation. Weed populations identified in or adjacent to the proposed projects would be treated using the most appropriate methods in accordance with the 1998 Burns District Noxious Weed Management Program EA/Decision Record (DR) OR-020-98-05 and Vegetation Treatments Using Herbicides on BLM Lands in Oregon ROD October 2010 (Appendix C).

g. The risk of noxious weed introduction would be minimized by ensuring all equipment (including all machinery, 4-wheelers, and pickup trucks) is cleaned prior to entry to the sites, minimizing disturbance activities, and completing follow-up monitoring, to ensure no new noxious weed establishment. Should noxious weeds be found, appropriate control treatments would be performed in conformance with the 1998 Burns District Noxious Weed Program Management EA/DR OR-020-98-05 and Vegetation Treatments Using Herbicides on BLM Lands in Oregon ROD October 2010.

h. All proposed fences would be constructed using BLM approved standards for 3- or 4-strand wire fences.

i. Reseeding may take place in areas disturbed by implementation of rangeland improvement projects including herbicide treatments. Mixtures of native and adapted grass, forb, and shrub seed may be applied to designated areas with ground-based methods. The mixture would include native and nonnative species such as crested wheatgrass and bluebunch wheatgrass. Crested wheatgrass may be used in the seed mix because it is drought tolerant, competitive with invasive species, has a long seed viability period, and aggressive germination characteristics.

j. Any road damaged by vehicles or equipment would be restored to its previous standard, with special attention placed on installing and improving drainage on the road.

D. Alternative III: Same Actions as Alternative II Except for a Change to Range Improvement "e"

Alternative III would be the same as Alternative II with the exception to Range Improvement "e." This alternative would inter-seed two 50-acre medusahead-infested areas with native and nonnative plant species in South Big Hill Pasture and in North Big Hill Pasture (Map I). Both sites selected receive high frequency, intensity, and duration of wild horse use. Species would consist of cultivars listed below at a total rate of 9 lbs/acre.

1. Native Plant Seed:
   a. Bluebunch wheatgrass – 2 lbs/acre
   b. Basin Wildrye – 1 lb/acre
2. Nonnative Plant Seed:
   a. Hycrest Crested Wheatgrass – 4 lbs/acre
   b. Forage Kochia – 2 lbs/acre
      (1) Each site would be rested from both livestock and wild horses for 2 years. This would be achieved by constructing a temporary, 3-strand barbed and 1-strand smooth lower wire fence around each 50-acre site. Once the seeded species are established or rested for a minimum two growing seasons, the fence would be removed to allow use by livestock and wild horses.
      (2) Material, Equipment and Labor Costs
         (a) Seed = $3,500
         (b) Fence
            i) Labor = $5,800
            ii) Material = $5,000/2
         (c) Drill = $670/100 acres
         (d) Tractor and Labor = $400/day x 4 days = $16,000
         (e) Fence Removal = $5,800
         (f) Total = $22,370

E. Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

This alternative would reduce Active AUMs by 25 percent equating to 1,580 Active AUMs for this permit. Reducing the AUMs would be achieved by reducing the number of livestock (Table 6). The season of use and range improvement projects would be the same as the Proposed Action (Alternative II). The new permit would have 243 livestock from April 1 to October 15 for 1,580 Active AUMs.

Table 6: Reduction in the Number of Livestock
(3-Year Rotation)

Year	Pasture Number	Pasture Name	Approximate Cow Numbers	Approximate Use Dates	Approximate AUMs	Season of Use (Grazing Treatment Description)
1	1	North	Herd A - 250	04/10 – 05/11	263	Graze
1	2	South	Herd A - 250	05/12 – 06/12	263	Graze
1	9	South Big Hill	Herd A - 250	06/13 – 07/14	263	Graze
1	3	Government Field	Herd A - 250	07/15 – 07/28	115	Defer
1	4	Deep Creek	Herd A - 250	07/29 – 09/08	345	Defer
1	7	Fisher Field	Herd B - 85	04/15 – 05/25	115	Graze
1	6	Tank	Herd B – 85	05/26 – 06/24	84	Graze
1	5	West Field	Herd B - 85	06/25 – 08/09	129	Defer
1	12	Hay Meadow	8	04/01 – 10/15	50	
1	8	North Big Hill	0	N/A	0	Rest
2	5	West Field	Herd A - 250	04/10 – 05/11	263	Graze
2	8	North Big Hill	Herd A - 250	05/12 – 06/14	279	Graze
2	9	South Big Hill	Herd A - 250	06/15 – 07/16	263	Graze
2	4	Deep Creek	Herd A - 250	07/17 – 08/27	345	Defer
2	3	Government Field	Herd A - 250	08/28 – 09/10	115	Defer
2	6	Tank	Herd B - 85	04/15 – 05/14	84	Graze
2	7	Fisher Field	Herd B – 85	05/15 – 06/24	115	Graze
2	1	North	Herd B - 85	06/25 – 08/09	129	Defer
2	12	Hay Meadow	8	04/01 – 10/15	50	
2	2	South	0	N/A	0	Rest
3	1	North	Herd A - 250	04/10 – 05/11	263	Graze
3	8	North Big Hill	Herd A - 250	05/12 – 06/14	279	Graze
3	2	South	Herd A - 250	06/15 – 07/16	263	Graze
3	3	Government Field	Herd A - 250	07/17 – 07/30	115	Defer
3	4	Deep Creek	Herd A - 250	07/31 – 09/10	345	Defer
3	7	Fisher Field	Herd B - 85	04/15 – 05/25	115	Graze
3	6	Tank	Herd B – 85	05/26 – 06/24	84	Graze
3	5	West Field	Herd B - 85	06/25 – 08/09	129	Defer
3	12	Hay Meadow	8	04/01 – 10/15	50	
3	9	South Big Hill	0	N/A	0	Rest

F. Alternative V: Shorten the Season of Use

Change the season of use from April 1 to October 15 to May 1 to October 15 (Table 7). The Active AUMs and range improvement projects would be the same as the Proposed Action (Alternative II). The new permit would have 382 livestock from May 1 to October 15 for 2,107 Active AUMs.

Table 7: Shorten the Season of Use
(3-Year Rotation)

Year	Pasture Number	Pasture Name	Approximate Cow Numbers	Approximate Use Dates	Approximate AUMs	Season of Use (Grazing Treatment Description)
1	1	North	Herd A - 350	05/01 – 06/01	368	Graze
1	2	South	Herd A - 350	06/02 – 07/02	357	Graze
1	9	South Big Hill	Herd A - 350	07/03 – 08/04	380	Graze
1	3	Government Field	Herd A - 350	08/05 – 08/20	184	Defer
1	4	Deep Creek	Herd A - 350	08/21 – 09/20	299	Defer
1	7	Fisher Field	Herd B - 120	05/01 – 06/15	181	Graze
1	6	Tank	Herd B - 120	06/16 – 07/16	122	Graze
1	5	West Field	Herd B - 120	07/17 – 08/30	178	Defer
1	12	Hay Meadow	8	05/01 – 10/15	44	
1	8	North Big Hill	0	N/A	0	Rest
2	5	West Field	Herd A - 350	05/01 – 06/01	368	Graze
2	8	North Big Hill	Herd A - 350	06/02 – 07/02	357	Graze
2	9	South Big Hill	Herd A - 350	07/03 – 08/03	368	Graze
2	4	Deep Creek	Herd A - 350	08/04 – 09/01	334	Defer
2	3	Government Field	Herd A - 350	09/02 – 09/20	219	Defer
2	6	Tank	Herd B - 120	05/01 – 06/01	126	Graze
2	7	Fisher Field	Herd B - 120	06/02 – 07/15	174	Graze
2	1	North	Herd B - 120	07/16 – 08/30	181	Defer
2	12	Hay Meadow	8	05/01 – 10/15	44	
2	2	South	0	N/A	0	Rest
3	1	North	Herd A - 350	05/01 – 06/01	368	Graze
3	8	North Big Hill	Herd A - 350	06/02 – 07/02	357	Graze
3	2	South	Herd A - 350	07/03 – 08/03	368	Graze
3	3	Government Field	Herd A - 350	08/04 – 08/25	253	Defer
3	4	Deep Creek	Herd A - 350	08/26 – 09/20	299	Defer
3	7	Fisher Field	Herd B - 120	05/01 – 06/01	126	Graze
3	6	Tank	Herd B - 120	06/02 – 07/02	122	Graze
3	5	West Field	Herd B - 120	07/03 – 08/20	193	Defer
3	12	Hay Meadow	8	05/01 – 10/15	44	
3	9	South Big Hill	0	N/A	0	Rest

G. Alternative VI: Removal of Livestock

Livestock grazing would no longer be authorized on the Happy Valley Allotment. The only range improvements that would be implemented are Smyth Creek gap fences, inter-seeding medusahead infestation, for either Alternative II or III, and treating medusahead with Plateau. Under the alternative, wild horses would continue to have access to Frog Creek year-round. The Frog Creek Exclosure would be implemented only if monitoring indicates heavy use on riparian woody species greater than 10 percent and herbaceous species greater than 50 percent by wild horses following the removal of livestock. This alternative includes the removal of interior pasture fences. Maintenance of range improvements, including drinking water sources and interior riparian exclosures, would become the responsibility of the BLM. Perimeter fences would be maintained by adjacent grazing permittees and private landowners. Refer to Map K for locations of the range improvements that would be removed under this alternative.

H. Alternatives Considered but Eliminated from Further Analysis

1. Conversion of Livestock Type and Removal of Fences

This alternative would convert the current livestock grazing permits from cattle to domestic sheep. Because sheep utilization is intensively managed by a herder, the internal allotment fences could be removed. This type of livestock use would manage utilization levels and timing of use on riparian areas and around reliable water sources, therefore improving rangeland condition without the construction of a riparian exclosure around Frog Creek. Removal of fences would benefit the free-roaming nature of wild horses and potentially improve wild horse distribution across the HMA. However, this alternative was eliminated from detailed analysis for the following reasons:

a. Proximity to Bighorn Sheep - Bighorn sheep have been documented within 3 miles of this allotment, which could result in contact with domestic sheep. The BLM's policy of separation distance is 9 miles. Interactions between wild and domestic sheep have proven to be detrimental to bighorn sheep populations. In recent years, biologists and veterinarians have shown that even casual contact may lead to respiratory disease and fatal pneumonia in bighorns (Onderka and Wishart 1988; Schommer and Woolever 2006). In the summary of their disease overview, Schommer and Woolever (2006) quote several scientists concluding contact between bighorn and domestic sheep increases the risk of bighorn mortality and complete range of causal agents that lead to these disease events cannot be conclusively proven at this point. Therefore, segregation of these two species on native range is the best management tool until more information is collected.

b. Removal of Fences - Internal fences would include one that separates North Big Hill and South Big Hill Pastures and two that separates Tank and West Field Pastures that would be an approximate total of 4.9 miles. All other fences that separate pastures within this allotment would not be removed because they are adjacent to, surrounded by, or the boundary of private lands, other allotments, or the Kiger HMA. Removal of the fence that separates South Big Hill and North Big Hill Pastures would have potential benefits to the free-roaming nature and distribution of wild horses.

c. No demand for domestic sheep grazing – Happy Valley Allotment has historically been a cattle grazing allotment. The permittee that holds the grazing permit on the allotment operates a ranch which has been producing cattle for multiple generations. The infrastructure of this ranch (i.e., handling facilities, winter range, winter feed, and employees) are designed for cattle production, and significant costs would be required to facilitate the switch to sheep production. There has been no demand by the affected permittee to switch to sheep production on this allotment.

2. Switch to Early Season Livestock Grazing within the South Big Hill Pasture Instead of Building the Frog Creek Exclosure

This alternative would change the current season of use in the South Big Hill Pasture from seasonlong (April 1 to October 15) every year, to an early (April 1 to June 1) treatment every year. The early graze treatment would be designed to allow ample time for regrowth of riparian vegetation along Frog Creek following livestock removal.

This alternative was considered but did not receive further analysis because it did not address year-round wild horse access to Frog Creek in making significant progress toward achieving PFC for those standards at risk. Although removing livestock grazing along Frog Creek during the critical growing season of riparian vegetation would eliminate heavy utilization by livestock, wild horses would continue to have year-round access to this stream. The resource objective to cause an upward trend in riparian habitat condition along this stream would potentially not be achieved and the Standard would continue to be at risk.

Based on the above rationale, this alternative was not considered for further analysis.

3. Herding livestock, removal of internal fences, and reject the implementation of the Frog Creek Exclosure. This alternative would remove the fence that separates North Big Hill and South Big Hill Pastures and Tank and West Field Pastures. Removing the fence that separates North Big Hill and South Big Hill Pastures would provide unlimited access by wild horses to both pastures and increase the impression of openness in the area for some recreationalists. All other pasture fences would not be removed since they are not adjacent to any other pastures in this allotment. This alternative was eliminated from detailed analysis for the following reasons:

   a. Wild horse use of Frog Creek would still be unmanaged. The riparian affects would be similar to those described above, but to a smaller degree, if cattle are successfully kept out of the riparian area. The presence of riders and increased commotion associated with herding the livestock in this area would tend to keep the horses more alert.

   b. While herding is a simple idea much is needed to successfully implement cattle herding as a livestock management strategy. In these two pastures one or two riders would have to work this area every day. It takes several years for the cattle to get used to changed management. Problems that often occur during this learning period include small groups of cattle that get separated from the main bunches and end up spending long periods of time near springs, bottlenecks of cattle use along streams or in canyons, placement of cattle in areas where it is very difficult to get them to stay, figuring out the good and poor cattle locations, and lost cattle. This puts stress on the cattle which results in reduced performance.

      Combining strategic supplement placement with herding has shown synergistic benefits (Bailey 2004). Providing offsite attractants such as alternate water, shade, or supplement along with herding appeared to be more effective for riparian management than herding alone. Monitoring of intensive herding management in Idaho found that the program was successful when the herder showed a consistent daily presence on the allotment (Butler 2000). If the herder missed just one day, the cows became unsettled and often refused to be herded.

      If this alternative were unsuccessful, it would cost approximately $39,000 to reconstruct the 4.9 miles of fence removed.

CHAPTER III: DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

An IDT has reviewed and identified issues and resources affected by the alternatives, the results are summarized in Table 8 below. Affected resources are in bold.

This Environmental Consequences Section presents the potential changes to the environment resulting from implementation of the alternatives. This chapter describes all expected effects including direct, indirect, and cumulative on resources from enacting the proposed alternatives.

Direct and indirect effects plus past actions become part of the cumulative effects analysis; therefore, use of these words may not appear. The Reasonably Foreseeable Future Actions (RFFAs) for this site are continued livestock grazing, wild horse management, weed treatments, road maintenance, recreation activities, and machine pile and burn of previously cut juniper (Five Creeks Rangeland Restoration Project); these are also relevant to cumulative effects and are discussed under each resource as applicable. Past and RFFAs vary under each resource because spatial and temporal scales address different variables such as wildlife set at a large scale versus upland vegetation set at a smaller scale where local management of the allotment has a direct affect.

Table 8: Elements Affecting the Human Environment

Elements of Human Environment		**If Not Affected, why? If Affected, Reference Applicable EA Section**
ACECs	Affected	Kiger ACEC, see Chapter III, Section A.11
Air Quality (Clean Air Act)	Not Affected	The Proposed Action includes construction of range improvements; however, these actions would not have a measurable effect on air quality.
American Indian Traditional Practices	Affected	See Chapter III, Section A.9
Cultural Heritage	Affected	See Chapter III, Section A.10
Environmental Justice (Executive Order 12898)	Not Affected	The Proposed Action and alternatives would not have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations as such populations do not exist within the project area.
Farmlands (prime or unique)	Not Present	No concerns have been disclosed.
Grazing Management/ Rangelands	Affected	See Chapter III, Section A.8
Fisheries	Affected	There are two fish bearing streams on public land in this allotment, see Chapter III, Section A.3
Flood Plains (Executive Order 13112)	Not Present	No occupancy or modification of flood plains, no risk of flood loss.
Hazardous or Solid Waste	Not Present	No concerns have been disclosed.

Migratory Bird Treaty Act (Executive Order 13186)		Affected	See Chapter III, Section A.6
Noxious Weeds (Executive Order 13112)		Affected	See Chapter III, Section A.4
Paleontology		Not Affected	It is not likely any alternative would have an affect beyond what has occurred in the past.
Recreation/Visual Resources		Affected	See Chapter III, Section A.12
Riparian Zones/Wetlands and Water Quality (Executive Order 11990)		Affected	See Chapter III, Section A.3
Social and Economic Values		Affected	See Chapter III, Section A.13
Soils and Biological Soil Crusts (BSCs)		Affected	See Chapter III, Section A.1
SSS and Habitat	Wildlife	Affected	Sage-grouse, See Chapter III, Section A.7
	Plants	Not Present	No known SSS within this allotment.
	Fish	Affected	Redband Trout, See Chapter III, Section A.3
Threatened or Endangered (T/E) Species or Habitat	Wildlife	Not Present	No known T/E species found within the allotment.
	Plants	Not Present	No known T/E species found within the allotment.
	Fish	Not Present	No known T/E species found within the allotment.
Upland Vegetation		Affected	See Chapter III, Section A.2
Wild and Scenic Rivers (WSRs)		Not Present	There are no WSRs within the allotment.
Wilderness/WSAs		Not Present	
Wilderness Characteristics		Not Present	See Chapter I, Section H
Wildlife/Locally Important Species and Habitat		Affected	See Chapter III, Section A.5

A. Resources

1. Soils/Biological Crusts

a. *Affected Environment:* Soils/Biological Crusts

(1) Soils

The Happy Valley Allotment is made of three general soil map units: the Ninemile-Westbutte-Carryback (~54 percent), Baconcamp-Clamp-Rock outcrop (~13 percent) and Raz-Brace-Anawalt associations (~33 percent).

The Ninemile-Westbutte-Carryback unit is defined as well drained, shallow and moderately deep soils that formed in residuum and colluvium (USDA, NRCS 2006). These soils occur on plateaus, hills, and mountains that receive 12 to 16 inches of precipitation with slopes 0 to 70 percent (USDA, NRCS 2006). Within this general soil map unit that is within the allotment boundary there are four dominant soils: Ninemile, Edemaps, Felcher, and Westbutte. The Ninemile rangeland ecological site is a Claypan 12-16 Precipitation Zone (PZ) (RO23XY216OR). The Edemaps rangeland ecological site is a Droughty Loam 11-13 PZ (RO23XY316OR).

The Felcher rangeland ecological site is a South Slopes 8-12 PZ (RO23XY300OR). The Westbutte rangeland ecological site is a North Slopes 12-16 PZ (RO23XY310OR). Major soil limitations are steepness of slope, hazard of water erosion, and soil depth. These soils are mainly found within the North Big Hill, South Big Hill, and South Pastures of the allotment.

The Raz-Brace-Anawalt unit is defined as well drained, shallow and moderately deep soils that formed in alluvium and colluvium (USDA, NRCS 2006). These soils occur on plateaus and hills that receive 8 to 12 inches of precipitation with slopes 0 to 30 percent (USDA, NRCS 2006). Within this general soil map unit within the allotment boundary there are six dominant soils: Lonely, Roca, Vergas, Brace, Raz, and Coztur. The Lonely rangeland ecological site is a Loamy 10-12 PZ (RO23XY212OR). The Roca rangeland ecological site is a South Slopes 8-12 PZ (RO23XY300OR). The Vergas rangeland ecological site is a Loamy 10-12 PZ (RO23XY212OR). The Brace rangeland ecological site is a Loamy 10-12 PZ (RO23XY212OR). The Raz rangeland ecological site is a Loamy 10-12 PZ (RO23XY212OR). The Coztur rangeland ecological site is a Loamy 10-12 PZ (RO23XY212OR). Major soil limitations are soil depth, low available water capacity, and hazard of water erosion. These soils are found mainly within the Tank, West Field, Fisher Field, North, and Hay Meadow Pastures of the allotment.

The Baconcamp-Clamp-Rock outcrop unit is defined as well drained, shallow and moderately deep soils that formed in colluvium (USDA, NRCS 2006). These soils occur on mountains that receive 12 to 40 inches of precipitation with slopes 5 to 80 percent (USDA, NRCS 2006). Within this general soil map unit that is within the allotment boundary there are two dominant soils that include: Duff and Clamp. The Duff rangeland ecological site is a Loamy 12-16 PZ (RO23XY180OR).

The Clamp rangeland ecological site is a Claypan 12-16 PZ (RO23XY216OR). Major soil limitations are steepness of **s**lope, hazard of water erosion, short growing season, and soil depth. These soils are mainly found within the Government Field and Deep Creek Pastures of the allotment.

Soil conditions over much of the allotment are acceptable because upland vegetation is at or near potential; however areas within the West Field, North, North Big Hill, South Big Hill Pastures and within the Frog Creek riparian area are below potential where there is more than expected bare ground (> 60 percent) and/or a high component of invasive annual grasses. Although these soils are cobbly and somewhat resistant to erosion, plant communities with more bare ground than expected and diminished BSCs, and therefore more exposed soils, have a greater potential for erosion than soils under plant communities that are at or near potential.

(2) Biological Soil Crusts

BSCs such as mosses, lichens, micro fungi, cyanobacteria and algae play a role in a functioning ecosystem and are one of at least 12 potential indicators used in evaluation watershed function for uplands. In addition to providing biological diversity, BSC contribute to soil stability through increased resistance to erosion and nutrient cycling (BLM TR 1730-2). There has not been a systematic inventory for BSCs within Happy Valley Allotment; however, this would be completed within the next 5 years using Pace 180° toe hits.

b. *Environmental Consequences:* Soils/Biological Crusts

(1) Effects Common to All Alternatives

For the purposes of this analysis, the Cumulative Effects Analysis Area (CEAA) for soils and BSCs is the allotment boundary. Past and present actions and events, such as those described in the Affected Environment, have influenced the existing environment within the CEAA. RFFAs in the CEAA that may contribute to cumulative effects to soils and BSCs include the Five Creeks landscape rangeland health project, livestock grazing, hunting, and recreational pursuits.

(2) Alternative I: No Action

Under the No Action Alternative, there would be no range improvements which are to mitigate issues that have resulted in not achieving standards or standards at risk. In areas of heavy livestock, wildlife and wild horse use, there would continue to be a decline in vegetative cover and an increase in noxious weed species which would result in increased soil erosion from both wind and water sources. These heavy use areas would also see a decrease and/or entire removal of the BSC. Areas of light to moderate use, where vegetation is stable, would continue to have stable soils and BSCs.

(3) Alternative II: Proposed Action

The Proposed Action would have potential impacts to soils and BSCs, biodiversity and frequency by implementing the suggested grazing management and range improvements.

The Proposed Grazing Management Schedule would provide a graze, defer and rest rotation for upland vegetation within this allotment.

The new grazing rotation would provide key forage plants the opportunity to grow, store carbohydrates and reseed in each pasture. This would decrease the risk of wind and water erosion by maintaining a healthy vegetative component to the allotment leading to more stable soils and BSCs.

(a) Range Improvements:

The overall objectives of the range improvements would lead to more stable soils and BSCs within the allotment.

i) Frog Creek Exclosure would provide overall improvements to soils in the exclosure due to the potential increase in riparian vegetation, which would hold the soils in place. There would be disturbance and short-term soil loss associated with the installation of water troughs and the connected pipeline; however, when properly rehabilitated, soil and BSC loss would decrease and stabilize.

ii) Rehabilitating the crested wheatgrass seedings within West Field and North Pastures would improve soils by establishing deep-rooted bunchgrasses that would stabilize the soil surface from water and wind erosion, and maintain nutrient cycling in the soil profile. There would be short-term soil and BSC disturbance and/or loss associated with use of the brush mower; however, as vegetation establishes, soils and BSC loss would decrease and stabilize. The timeframe would depend on how long it takes for vegetation to reestablish, usually one to two growing season. Recovery for BSCs could be longer depending on the intensity of disturbance and adjacent "seed" sources.

iii) Skidoo Spring Water Development would create soil and BSC loss as a result of the ground disturbance caused by installing an approximately 3 to 4 feet by 1-mile trench for a pipeline, the pipeline and an additional trough within the South and North Big Hill Pastures. This loss would be temporary, one to two growing seasons, with soil and BSC stability returning as vegetation reestablishes in the disturbed areas.

iv) The addition of gap fencing either up or downstream of Frog Creek in relation to the Smyth Creek Exclosure would not have any measurable impacts on soils and BSCs.

v) By establishing two plant communities comprised of native and nonnative plant species in North Big Hill (170 acres) and South Big Hill (130 acres) Pastures (Map H), and removing livestock and wild horses from these pastures for two growing seasons, soils would have the opportunity to improve and stabilize and BSCs would have the opportunity to develop and/or improve and stabilize in areas that have been heavily grazed. There is the potential for soil and BSC loss during seed drilling, however, this would be short term and temporary, lasting one to two growing seasons. Once vegetation establishes, soils would stabilize and BSCs would develop and stabilize.

vi) Very little is known at this time with regards to the effect of herbicides on BSCs. One study, using glyphosate, showed no impact to mosses after one application, however, effects after multiple applications are not known (BLM TR 1730-2, pg. 47), nor are the effects on all biological crust species. Effects from Plateau have not been analyzed. Regarding invasive annual grasses, studies have shown that the "invasion of exotic annual plants into perennial plant communities can pose a long-term threat to biological soil crusts, as the crust dominated interspace between perennial plants is often heavily invaded" (BLM TR 1730-2, pg. 47). While there could be an initial decrease or loss to BSCs as a result of applying Plateau, reestablishment in the future due to the suppression and/or eradication of medusahead is possible. There is a greater threat for a complete loss of BSCs from not treating medusahead and allowing it to colonize the interspace habitat of BSCs.

(4) Alternative III: Change to Range Improvement "e"

This alternative would have the same potential effects on soils and BSCs as Alternative II, the Proposed Action, in all pastures except the North Big Hill and South Big Hill Pastures. Changes to range improvement "e" would reduce the amount of acres that are reseeded to 50 acres per pasture with exclosures constructed to prevent grazing in these areas (Map H). This reduces the number of acres from 300 to 100 where soils and BSCs would have the potential for improvement and establishment. These areas would be excluded from livestock and wild horse grazing for a minimum of 2 years to allow for vegetation to establish resulting in the potential for improved soil stability and an increase or development of BSCs within the exclosures. These exclosures would be removed after the seedings established or a minimum of 2 years. There would be short-term, temporary soil and BSC loss during the construction and removal of the exclosures, as well as with seed drilling, however, once vegetation establishes, one to two growing seasons, soils would stabilize and BSC would establish.

(5) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers and Alternative V: Shorten the Season of Use

The impacts of either alternative on soils BSC are expected to be the same or similar to the impacts of the no action alternative. The monitoring and evaluation found current livestock numbers were not causing unacceptable vegetation conditions, nor secondarily unacceptable soil condition or BSC status. So reducing livestock use by reducing AUMs or shortening the season of use would not be expected to produce noticeable improvement in these conditions. Because both alternatives would increase the remaining livestock's ability to express individual preferences for forages and locations, they would continue to use their preferred areas as much as possible. These are the areas currently with heavier use. The areas that are currently lightly or not used by cattle would continue, and impacts to vegetation, soils, and BSC would be unchanged. In addition, neither alternative addresses wild horse use patterns, so impacts to soils and BCS from wild horses would be unchanged.

(6) Alternative VI: Removal of Livestock

The removal of livestock from the allotment could improve soil stability and establishment of BSCs by decreasing overall hoof impact and compaction; however, livestock are not the causal factor in not meeting rangeland standards with the exception of West Field Pasture. In the West Field Pasture, a graze/defer management plan has already been implemented with resulting increases in vegetation vigor leading to an increase in the stability of soils and BSCs. The greater threat to soils and BSCs in the allotment is due to an invasion of medusahead rye. While the removal of livestock would decrease the amount of seed transported throughout the allotment, there would still be transportation by wildlife and wild horses. Effects of installation of gap fences, inter-seeding and treatment of medusahead with Plateau would be the same as Alternatives II and III.

2. Upland Vegetation

a. *Affected Environment:* Upland Vegetation

The dominant rangeland ecological sites associated with the three general soil map units: the Ninemile-Westbutte-Carryback, Raz-Brace-Anawalt, and Baconcamp-Clamp-Rock outcrop are described below (http://websoilsurvey.nrcs.usda.gov/).

(1) Ninemile-Westbutte-Carryback dominant rangeland ecological sites within the allotment are:

(a) Droughty Loam's (11-13 PZ) Potential Native Plant Community (PNPC) dominant vegetation would be Idaho fescue and Thurber's needlegrass, and associated species include basin big sagebrush, bluebunch wheatgrass, and Sandberg's bluegrass. Plant community vegetative composition would relatively be 75 percent grasses, 5 percent forbs, and 10 percent shrubs. Approximate ground cover was not estimated.

(b) Claypan's (12-16 PZ) PNPC dominant vegetation would be Idaho fescue, bluebunch wheatgrass, and low sagebrush. Plant community vegetative composition would relatively be 60 percent grasses, 10 percent forbs, and 30 percent shrubs. Approximate ground cover would be 20 percent to 30 percent (basal and crown).

(c) South Slopes' (8-12 PZ) PNPC dominant vegetation would be bluebunch wheatgrass and Wyoming big sagebrush. Plant community vegetative composition would relatively be 75 percent grasses, 5 percent forbs, and 20 percent shrubs. Approximate ground cover would be 30 percent to 45 percent (basal and crown).

(d) North Slopes' (12-16 PZ) dominant vegetation would be Idaho fescue and mountain big sagebrush. Plant community vegetative composition and approximate ground cover was not estimated.

Past Actions: The rangeland ecological sites described above occur in the North Hill, South Big Hill, and South Pastures. Vegetative range improvement projects that have occurred within these areas include prescribed burning and juniper cutting. In 1999 a prescribed fire burned approximately 3,800 acres primarily in the South Big Hill Pasture (2,010 acres) and South Pasture (610 acres); however, the fire burned non-targeted acres in North Big Hill Pasture (260 acres), Smyth Creek Exclosure (280 acres), and Smyth-Kiger Allotment in both Wood Camp (600 acres) and Ant Hill (40 acres) Pastures. Prior to the burn the northern and central areas of the South Big Hill Pasture plant community was dominated by Wyoming big sagebrush, squirreltail, Sandberg's bluegrass, and different densities of juniper trees from Phase I to Phase II stands (Miller et al. 2005). This area was lacking key grass species of the PNPC described in the South Slopes and Claypan rangeland ecological sites prior to the burn.

The prescribed burn in South Big Hill removed the sagebrush and killed a majority of the juniper trees in northern and central areas of the pasture. This action led to a plant community dominated by squirreltail and Sandberg's bluegrass. The fire further regressed the plant community to an earlier successional stage from the South Slopes and Claypan PNPC. This has provided opportunity for medusahead rye to invade. Areas of medusahead rye establishment have been found along the road and in high traffic areas by large herbivores predominately wild horses and cattle.

(2) Raz-Brace-Anawalt dominant rangeland ecological sites within the allotment are:

(a) Loamy (10-12 PZ) PNPC dominant vegetation would be Thurber's needlegrass and Wyoming big sagebrush, and associated species include Sandberg's bluegrass and Indian ricegrass. Plant community vegetative composition would relatively be 80 percent grasses, 5 percent forbs, and 15 percent shrubs. Approximate ground cover would be 15 percent to 25 percent (basal and crown).

(b) South Slopes (8-12 PZ) described in Ninemile-Westbutte-Carryback.

Past Actions: The rangeland ecological sites described above occur in the North, Fisher Field, Tank, and West Field Pastures. Vegetative range improvement projects that have occurred within these areas include crested wheatgrass seedings. Portions within this plant community have been converted to crested wheatgrass with these treatments occurring in the majority of West Field Pasture (2,250 acres), approximately one third in Fisher Field (230 acres) and North (992 acres) Pastures, and less than a tenth in Tank Pasture (36 acres). Within these pastures crested wheatgrass established on 3,508 acres, and 2,063 acres are still in the PNPC or converting to invasive annual grassland. Crested seedings were established in 1961 and 1962. In some areas there has been die off of Wyoming big sagebrush caused by Aroga Moth defoliation of sagebrush leaves (Bentz et al. 2008). The primary location this has been observed is in the West Field Pasture in both crested wheatgrass seedings and PNPCs. There have been two documented wildfires in these rangeland ecological sites that include a 1985 fire that burned 670 acres in the Fisher Field and 100 acres in West Field Pastures.

(3) Banconcamp-Clamp-Rock outcrop dominant rangeland ecological sites within the allotment are:

(a) Loamy (12-16 PZ) PNPC dominant vegetation would be Idaho fescue and mountain big sagebrush dominating the aspects. Plant community vegetative composition would relatively be 75 percent grasses, 10 percent forbs, and 15 percent shrubs. Approximate ground cover would be 15 percent to 25 percent (basal and crown). Approximate ground cover was not estimated.

(b) Claypan (12-16 PZ) described in Ninemile-Westbutte-Carryback.

Past Actions: The rangeland ecological sites described above occur in the Government Field and Deep Creek Pastures. The vegetative range improvement project that has occurred within these areas includes the Five Creeks Rangeland Restoration Project. Pastures treated are Deep Creek and Government Field Pastures. Deep Creek Pasture was broadcast burned in the fall of 2009, which treated 2,500 acres of private and public land. In the Government Pasture, 1,390 acres, 520 acres of juniper trees were cut, piled, and would be burned in 2011-2012. The purpose for cut, pile, and burn treatment method is to mitigate for an active sage-grouse lek in this pasture. Other pastures to be treated are South Big Hill Pasture, 575 acres near and around Frog Creek and South Pasture, 320 acres, on the southern quarter. Exact treatment dates for tree cutting and burning have not yet been determined, but predicted dates are 2011, 2012, and 2013. These rangeland ecological sites were part of the 1999 prescribed burn in both South Big Hill and South Pastures. There has been one documented wildfire in this plant community that includes a 2006 fire that burned 120 acres in the Deep Creek Pasture. These areas that burned have shown high resiliency following the fire and the plant community is dominated by Idaho fescue, bluebunch wheatgrass, and forbs such as arrow leaf balsamroot.

Western juniper woodlands and encroachment occur in the Banconcamp-Clamp-Rock outcrop and Ninemile-Westbutte-Carryback units. Western juniper historically occupied Juniper Tablelands (10-14 PZ). The PNPC would be Idaho fescue, bluebunch wheatgrass, low sagebrush, and Western juniper where fine fuels and/or latter fuels were too low in abundance to carry fire into the tree canopy (Miller et al. 2005).

The vegetative composition would be 70 percent grasses, 10 percent forbs, and 20 percent shrubs and trees; and ground cover 35 percent to 40 percent. Historic stands or pre-settlement woodlands (prior to 1860) were sparse and savanna-like on rocky shallow soils, which only makes up approximately 10 percent of the juniper stands found today across the Great Basin (Miller et al. 2008). However, over the past 130 years western juniper has encroached into more productive big sagebrush, quaking aspen, and riparian habitats (Wall et al. 2001). There is a mix of old growth stands (greater than 200 years old) and post-settlement stands in parts of these general map units. Species composition varies in the understory of western juniper and is correlated with on aspect, elevation, and soil depth; but as western juniper density increases and begins to fully occupy the site shrub species are lost from the plant community along with a decrease in long lived deep-rooted perennial grasses and forbs (Miller et al. 2005; Miller et al. 2008). The majority of the post-settlement juniper encroached areas are in the Five Creeks Rangeland Restoration Project (see Banconcamp-Clamp-Rock outcrop Section 3 above for completed treatments and proposed treatment acres).

b. *Environmental Consequences:* Upland Vegetation

(1) *Effects Common to All Alternatives*

For the purposes of this analysis, the CEAA for upland vegetation is within the allotment boundary to encompass vegetative management and response controlled within in Happy Valley Allotment. The CEAA for this section does not incorporate surrounding areas where vegetation management could have different management objectives or land ownership that dictates land management practices.

Past and present actions and events have influenced the existing environment within the CEAA. RFFAs in the CEAA that may contribute to cumulative effects to upland vegetation include livestock grazing, cutting and prescribed burning of juniper to reduce hazardous fuels and restore potential sagebrush plant communities, and prevent/reduce the establishment of invasive exotic plant species. RFFAs specific to this allotment include juniper cut and prescribed burn treatments of 895 acres within the next few years as part of the Five Creeks Rangeland Restoration Project. Past and RFFAs that have affected upland vegetation in the CEAA are found in Table 9.

Table 9: Upland Vegetation Past and Reasonably Foreseeable Future Actions within Happy Valley Allotment

ACTION	PAST ACTIONS				FUTURE ACTIONS			
	ACRES	SQ. MILES	MILES	RATIO: Length to Area	ACRES	SQ. MILES	MILES	RATIO: Length to Area
Wildfires	890	1.4	---	---	Unknown	Unknown	---	---
Rx Burns	6,300	9.8	---	---	895	1.40	---	---
Seedings	3,508	5.5	---	---	---	---	---	---
Roads	---	---	43	1.4:1	---	---	---	---
Fences	---	---	65.60	2.2:1	---	---	---	---
Pipe Line	---	---	9	0.3:1	---	---	---	---

(2) Alternative I: No Action

Under the No Action Alternative there would be no range improvements designed to mitigate issues resulting in not achieving standards or standards at risk. Current management would continue and ecological trend would continue to decline caused by the spread of exotic noxious weedy species primarily medusahead (Davies 2008). Continuous grazing during critical growth periods during a 4-year rotation for crested wheatgrass seedings would still be the grazing schematic. If this grazing schematic is followed then crested wheatgrass seedings would continue to decline in frequency, which would favor the continued establishment of Wyoming big sagebrush, green and gray rabbitbrush, and annual weeds such as cheatgrass and potentially medusahead (Miller et al. 1994; Davies 2008). If this trend continues eventually it could lead to a cheatgrass fire regime and the removal of Wyoming big sagebrush (Miller et al. 1994; Monaco et al. 2003). Research and trend monitoring in this District has shown that annual invasive grasses especially cheatgrass and medusahead are a threat to sagebrush ecosystems especially in rangeland ecological sites that supports Wyoming big sagebrush community types. Areas identified on Map H would most likely continue to decline in ecological trend correlated with continuous wild horse use (Beever et al. 2007) and in time convert to an annual grassland (Pyke 2000). If management does not address this infestation of medusahead, it would continue its spread and not only in adjacent plant communities within each pasture, but to other pastures and allotments in the area depriving livestock, wild horses, and wildlife of forage and habitat (Davies and Svejcar 2008; Pyke 2000; Mangla *In Press*).

(3) Alternative II: Proposed Action

The Proposed Action would have potential impacts to upland vegetation ecological trend, biodiversity, and frequency by implementing the suggested grazing management and range improvements.

The Proposed Grazing Management Schedule would provide a graze, defer, and rest rotation for upland vegetation within this allotment. The new grazing rotation would provide key forage plants the opportunity to grow, store carbohydrates, and reseed in each pasture. This would result in an increased upland and ecological trend for this allotment and for areas that did not meet Standards or that are at risk. Healthier perennial plant community either at or near the PNPC or crested wheatgrass seedings are more resistant to annual exotic grasses.

(a) Range Improvements:

i) Frog Creek Exclosure would not have any measurable impacts to Upland Vegetation.

ii) Crested Wheatgrass Seeding maintenance and rehabilitation by seeding crested wheatgrass, bluebunch wheatgrass, and forage kochia in the West Field and North Pastures would resist invasion by exotic noxious weeds and increase diversity and structure within the plant community that would increase soil stability, nutrient cycling, wildlife habitat and livestock forage. Long lived deep-rooted perennial grasses such as crested wheatgrass and bluebunch wheatgrass have been observed to be a key component in a plant community's resistance to invasive annual grasses such as cheatgrass and medusahead (Davies 2008; Davies and Svejcar 2008; Davies et al. 2010; Davies 2010). Adding forage kochia to the seed mix would also increase the plant community's species richness and biodiversity of desirable perennial plants and resistance to invasive annual grasses and forbs (Stevens et al. 1985; Clements et al. 1997; Monaco et al. 2003). Clements et al. (1997) concluded that native plants would become established in forage kochia seedings if fires are infrequent.

They reported that the spread of Wyoming big sagebrush, thickspike wheatgrass [*Elymus lanceolatus*], native bunchgrasses and forbs were common in the fourth growing season of a stand of forage kochia that had first suppressed cheatgrass. Forage kochia has been observed to be opportunistic in establishing in disturbed sites and in interspaces amongst perennial vegetation that has resulted in concerns of its ability to become another invasive plant species (Harrison et al. 2000). However, it has been concluded from studies in big sagebrush and desert shrub communities that forage kochia is not highly invasive and does not spread aggressively into healthy plant communities, but does compete well with species such as cheatgrass and halogeton that often provide severe competition to perennial species in disturbed areas (Blauer et al. 1993; Stevens et al. 1985; Clements et al. 1997; Monaco et al. 2003).

The brush mowing in West Field Pasture would reduce both live and dead Wyoming big sagebrush and increase perennial herbaceous response for both existing crested wheatgrass plants and seedling establishment of plants selected for maintenance. Sagebrush mowing would result in shrub kill and/or temporarily reduce vigor following the treatment. The mowing treatment would not eliminate sagebrush from the site, which would improve the ecological status of the area by reducing the threat of invasion by annual exotic grasses and increase perennial herbaceous plant frequency, biodiversity, and nutrient cycling such as carbon storage (Bradley et al. 2006; Miller et al. 2005; Rau et al. 2009).

iii) Skidoo Spring Water Development would impact upland vegetation along the route by creating a trench to bury the pipe. This area would be approximately one-half acre of ground disturbance. Any vegetation in line of this route would be removed in this area.

This would result in the mortality of any established perennial plants in a path 4 feet by 1-mile. Though this line is narrow revegetating this disturbed area would be critical to establish perennial plants and prevent exotic invasive plants such as medusahead from invading establishing. Reasons for selecting forage kochia are the same to benefits mentioned in range improvement b.

Crested wheatgrass would be used in the seed mix because it is drought tolerant, competitive with invasive species, has a long seed viability period, and has aggressive germination characteristics (Davies et al. 2010; Davies 2010). Research conducted in the Great Basin by A.C. Hull, indicates introduced wheatgrasses (i.e., crested wheatgrass) were superior to native grasses in establishing and persisting in cheatgrass infested rangelands (Hull and Stewart 1948; Hull 1974**).**

iv) Smyth Creek Exclosure would not have any measurable impacts to Upland Vegetation.

v) Establish two plant communities comprised of native and nonnative plant species with one in South Big Hill Pasture (130 acres) and one in North Big Hill Pasture (170 acres), and temporarily remove wild horses and livestock grazing from these two pastures for two growing seasons. This range improvement would improve upland vegetation ecological trend, biodiversity, and nutrient cycling. These areas are currently at risk with dominant grasses consisting of early seral perennial grasses that are Sandberg's bluegrass and bottlebrush squirreltail. It has already been observed that medusahead rye has established several dense patches in areas of continuous use by wild horses (Map H).

Interseeding bluebunch wheatgrass, basin wildrye, crested wheatgrass, and forage kochia into the existing plant community would improve the resistance of these two areas to medusahead invasion, continuous grazing by wild horses, and increase biodiversity. By resting both pastures specifically the areas identified on Map H for 2 years from wild horse and livestock use would provide an opportunity for perennial grass growth, seed production, and seedling establishment that has been suppressed from horse AUMs exceeding the AML by two to three fold in the past 10 years.

vi) Treat medusahead with Plateau would have moderate risk to no risk to the health of upland vegetation (Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States FEIS June 2007 [National Veg. FEIS] pp. 4-49 and 53). Applications of 6oz/acre would be below the maximum rate authorized to treat infested sites (Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS July 2010 [Oregon Veg. FEIS] C-9).

Risk to the health of terrestrial and Special Status plants at this application rate from direct spray would have moderate risk, offsite drift low risk (Special Status spp.) and no risk (terrestrial), surface runoff no risk, and wind erosion no risk. However, it has been observed that fall applications with 6oz/acre Plateau would further reduce the risk from moderate to low from direct spray on non-target plant species because these plants are dormant (Davies 2010; Davies and Sheley 2011). Plateau would reduce medusahead and allow existing native, desirable nonnative plants or seeded areas the opportunity to compete for available resources such as water, nitrogen and other nutrients, and reestablish the site once occupied by this invasive noxious weed.

(4) Alternative III: Change to Range Improvement "e"

This action would have the same potential impacts to upland vegetation ecological trend, biodiversity, and frequency by implementing the suggested grazing management and range improvements as the Proposed Action except for Range Improvement "e. Establish two plant communities comprised of native and nonnative plant species with one in South Big Hill Pasture (50 acres) and one in North Big Hill Pasture (50 acres), and temporarily exclude wild horses and livestock grazing from these 50-acre treatment sites for two growing seasons by constructing a fence around each site." This range improvement would improve upland vegetation ecological trend, biodiversity, and nutrient cycling only within the 50-acre treatment sites (Map H). The methods and results would be similar to the Proposed Action, but at a smaller scale and would not fully address the acres at risk identified in both pastures.

(5) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

Reducing the permitted AUMs by 25 percent by reducing livestock numbers would decrease overall grazing intensity on pastures in the allotment. Decreased intensity would result in lower utilization levels throughout the season of use of April 1 to October 15. However, issues identified were a result from reoccurring time of use by livestock during the growing season year after year, not the number of livestock.

Overall reduction in utilization as a result of reduced AUMs would come from less use in slight to light utilized areas per pasture, but areas of preference would still receive moderate to heavy use. This is the importance in pasture rotation, "time of use," to mitigate continuous grazing in areas of preference on vegetation during the growing season when plants are photosynthesizing, storing carbohydrates and nutrients, and producing seed. Concurrently there would be less social pressure amongst livestock to distribute across a pasture, and preferred areas would continue to receive the same use as the original stocking rate.

All other impacts would be the same as the effects analyzed for the Proposed Action.

(6) Alternative V: Shorten the Season of Use

Shortening the season of use from April 1 to October 15 to May 1 to October 15 would allow a month of forage growth prior to livestock turnout. This would give key forage plants (i.e., bluebunch wheatgrass, Idaho fescue, squirreltail, and crested wheatgrass) and invasive annual grasses the opportunity to begin growth before grazing occurred on these plants. This would also result in a grazing schedule with more pastures receiving deferred grazing on upland vegetation throughout the grazing season, which reduces the impacts on plant growth of that year and carbohydrate storage for the following growing season. However, the Proposed Alternative's grazing schedule is designed to provide deferment and rest in all pastures, and shortening the season of use would not have measurable increases to plant vigor and production.

All other impacts would be the same as the effects analyzed for the Proposed Action.

(7) Alternative VI: Removal of Livestock

Under this alternative large ungulate grazing impact to vegetation would be reduced. Cattle are a big part of the grazing use on this allotment. Wild horses and elk would be expected to respond to livestock removal in certain pastures in particular South, South Big Hill, and North Big Hill. The levels and patterns of wild horse use would be expected to remain similar to the current situation in North Big Hill and South Big Hill Pastures. This is because horse numbers are controlled by the BLM. Compensatory increases in horse numbers and subsequent expansion of use areas would be minimal.

Upland areas of concern identified in the South Big Hill and North Big Hill Pastures threatened by medusahead invasion and continuous wild horse use would continue. Even without livestock trailing through the medusahead there would still be trailing by wild horses and other wildlife through infested sites. Internal fences would be removed from the allotment. This may benefit the movement of wild horses. However, this would only be 4.9 miles of fence due to surrounding allotments, private property, and the boundary of both the Kiger HMA and ACEC.

Forage plants in areas that now receive cattle use and little wild horse use would have less grazing pressure. However, research has found that with current management practices in the last half century, which incorporate grazing rotations and light to moderate use has not decreased species diversity of either plants or animals and may have increased diversity (Laycock 1994). Laycock (1994) concludes that "many vegetation types on public land are in a stable condition and would change little, if at all, if livestock were removed." This book chapter suggests that other actions are needed to manipulate an undesirable trend or stable vegetative state in order to achieve objectives for upland vegetation standards and watershed function and processes. Another finding was that study sites with complete exclusion of livestock use compared to study sites with moderate livestock use decreased resiliency of *A. tridentata* ssp. *wyomingensis* plant communities to fire (Davies et al. 2009). The ungrazed sites resulted in a reduction of perennial grasses and the increase of *B. tectorum* (cheatgrass), where in the grazed study sites there was no evidence of cheatgrass invasion (Davies et al. 2009). Effects of installation of gap fences, inter-seeding and treatment of medusahead with Plateau would be the same as Alternatives II and III.

3. Wetlands, Riparian Zones, Water Quality, and Fisheries

a. *Affected Environment:* Wetlands, Riparian Zones, Water Quality, and Fisheries

The majority of Happy Valley Allotment falls within the Riddle Creek Watershed (approximately 19,360 acres) with a smaller portion (3,324 acres) in the Kiger Creek-Diamond Canal Watershed (5th field HUC). Riddle Creek and Smyth Creek are the only known streams providing salmonid habitat (redband trout) on the public land within this allotment. Riddle Creek is 27.6 miles long with approximately 3.1 miles (11.2 percent) falling under BLM administration in Happy Valley Allotment. Smyth Creek is approximately 16.4 miles long with 4.96 (30 percent) on public land in Happy Valley Allotment. Frog Creek is 2.2 miles long of which 1.9 miles are on public land in this allotment. Riddle and Smyth Creeks exceed the 68 ºF temperature standard set by ODEQ for salmonid bearing streams. Temperature has not been measured on Frog Creek.

A PFC Assessment and Photo Monitoring on Frog Creek indicate riparian condition is functioning at risk. Excess sediment from a road crossing and effects from livestock and wild horse grazing were factors in this rating.

In 2004, juniper were cut and left along this drainage. Initially, the down juniper offered some protection to the riparian zone from grazing impacts. Over time, the juniper has broken down and is currently inadequate to protect riparian vegetation from late season grazing by livestock.

Livestock are currently excluded from both Riddle and Smyth Creeks. Apart from the Proposed Action enhancing the exclosure fence around Smyth Creek, the alternatives would not change management or impact these drainages. Therefore, Riddle and Smyth Creeks would not be discussed further in this document.

b. *Environmental Consequences:* Wetlands, Riparian Zones, Water Quality, and Fisheries

(1) Alternative I: No Action

The No Action Alternative would primarily affect riparian, water quality, and fisheries along Frog Creek. Under this alternative the BLM Standard for Watershed Function in Riparian/Wetland Areas would not be achieved. Frog Creek would remain functioning at risk or deteriorate to nonfunctioning condition. Down juniper along the stream would continue to break down, eventually offering little to no protection from late season grazing impacts of livestock or horses. Active erosion would increase, effecting aquatic habitat and water quality downstream.

(2) Alternative II: Proposed Action

Livestock Grazing and Wild Horse Management**:** All public streams within the allotment are either currently excluded from livestock and wild horses, or are proposed for exclusion under this alternative. Proposed livestock management under this alternative would therefore have no effect on riparian, fisheries or water quality.

(a) Range Improvements: The only proposed range improvements that would affect Riparian, Water Quality and Fisheries Habitat would be project "a" Frog Creek Exclosure, project "d" Smyth Creek Gap Fences, and project "f" Medusahead Treatments.

i) Project "a" Frog Creek Exclosure: Livestock and wild horse impacts would be eliminated along the fenced portions of Frog Creek under this alternative.

Deep-rooted, hydric herbaceous vegetation would be allowed to complete their growing and reproductive cycles without utilization by livestock or wild horses. As later seral, deeper rooted plant species are established, greater bank stability, increased shading and greater water storage/ retention are expected. These changes typically improve water quality and salmonid habitat by increasing the sediment storage capacity of riparian zones, reducing turbidity, and reducing water temperatures. Riparian habitat would improve to PFC.

ii) Project "d" Smyth Creek Gap Fences: Smyth Creek is currently excluded from grazing by a series of gap fences constructed along the canyon rim. Along the rim, there are a few areas where livestock are able to enter the exclosure. This has allowed for occasional late season use along Smyth Creek. Improving the existing fence to eliminate these access points would eliminate this late season use. Currently, this use is minimal. However, juniper in the Smyth Creek Canyon is currently being treated (cut and piled and cut and jackpot burned) as part of the larger Five Creeks Rangeland Restoration Project. After Smyth Creek Canyon is treated, it is expected livestock and wild horses would have increased access to Smyth Creek from the removal of the physical and visual obstructions (juniper). Improving the existing gap fence would prevent this access.

iii) Project "f" Treat medusahead with Plateau would have moderate risk to no risk to the health of aquatic plants in streams or ponds if accidental spills or spray treatments were to occur. Risk to the health of aquatic plants at this application rate from accidental direct spray would have low risk, offsite drift no risk, surface runoff no risk, and accidental spill into a pond moderate to high risk (National Veg. FEIS, pp. 4-49). Aquatic plants would not be at risk from offsite drift of Plateau except when applied aerially at the maximum rate with a buffer less than 100 feet.

SOPs would not treat within suggested buffers and mitigation measures of avoidance would be implemented for all Plateau treatments (Appendix C Water Resources and Wetlands and Riparian Areas). As long as SOPs are followed there is no risk to Water Resources and Wetlands and Riparian Areas.

(3) Alternative III: Change to Range Improvement "e"

Effects would be the same as analyzed in Alternative II.

(4) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

Effects would be the same as analyzed in Alternative II.

(5) Alternative V: Shorten the Season of Use

Effects would be the same as analyzed in Alternative II.

(6) Alternative VI: Removal of Livestock

Removing livestock grazing would reduce grazing impacts in unfenced riparian/wetland areas. This would largely have the same effects as those analyzed under the Proposed Action, Frog Creek Exclosure. Over time, removal of livestock grazing would result in late seral riparian vegetation and increased deciduous woody species recruitment. However, under this alternative, wild horses would still have year-round access to Frog Creek. Like cattle, wild horses preferentially select riparian habitats during the growing season (Crane 1997). If the wild horse population increases and the BLM is not able to gather in a timely manner, then additional impacts to Frog Creek from wild horses could occur. Effects of installation of gap fences, inter-seeding and treatment of medusahead with Plateau would be the same as Alternatives II and III.

4. Noxious Weeds and Invasive Nonnative Plant Species

a. *Affected Environment:* Noxious Weeds and Invasive Nonnative Plant Species

The Burns District BLM database currently lists 75 noxious weed sites totaling 389.39 acres in the Happy Valley Allotment. There have been six different noxious weed species documented in the allotment. The numbers and acreages associated with each are displayed in Table 10 below:

Table 10: Noxious Weed Distribution

Noxious Weed Species	**Number of Sites**	**Acres**
Canada thistle (*Cirsium arvense*)	27	72.8
Bull thistle (*Cirsium vulgare*)	11	6.3
Scotch thistle *(Onopordum acanthium)*	4	0.09
Diffuse knapweed *(Centaurea diffusa)*	1	123.6
Whitetop *(Cardaria draba)*	21	12.9
Medusahead rye (*Taeniatherum caput-medusae*)	11	173.7
Totals	***75***	***389.39***

Approximately 60 percent of the Happy Valley Allotment has been systematically surveyed for noxious weeds during treatments and monitoring for various projects that have been proposed including the ongoing Five Creeks Rangeland Restoration Project. The road network has been well inventoried.

Most of the weed infestations have been treated. In the past, medusahead has been treated with glyphosate, primarily along the roads to minimize opportunities for spread. Weed sites are monitored annually and retreated as needed. The Canada thistle and whitetop in Smyth Creek Canyon have not yet been treated. They should be treated in 2011 and 2012. Treatments in the Happy Valley Allotment are displayed in Table 11 below:

Table 11: Weed Treatments

Year	Species	Acres Treated	~Project Acres
2010	Medusahead rye	4	100
	Canada, Scotch and Bull Thistles	1.24	250
	Diffuse knapweed	2.2	2,522
	2010 Total	**7.44**	
2009	Diffuse knapweed	0.12	2,522
	Medusahead rye	2.8	50
	2009Total	**2.92**	
2008	Diffuse knapweed	**0.8 (2008 total)**	2,522
2006	Diffuse knapweed	**0.16 (2006 total)**	2,522
2005	Perennial pepperweed	**0.3 (2005 total)**	80

The most contentious weed problem in the allotment is medusahead rye. Acreage estimates for medusahead from our database (173 acres) are probably under actual infested acres due to the continued establishment of new, small, and undocumented sites. Medusahead has been increasing in some of the allotment uplands for many years. In some areas it is replacing the native bunchgrasses. Some portions of the allotment receive heavy wild horse utilization. Many of these areas are infested with medusahead.

In areas with heavy clay soils, medusahead can and does outcompete mid- and late seral species, as well as competitive introduced species such as crested wheatgrass (Pyke 1999). However, management actions that encourage mid- to late seral vegetation and good to excellent condition rangeland, managed to encourage vigor and productivity in those species, would be helpful in occupying niches and slowing down potential movement of medusahead into those areas.

Grazing management which revitalizes and invigorates those species would be beneficial for enhancing weed resistance in this allotment. Burning areas with medusahead favors medusahead (Young 1992). We suspect fire exacerbates the problem by opening up more unoccupied niches for medusahead to establish and increase. Fire can stimulate desirable grasses and forbs and reduce medusahead. However, if the burn is not followed shortly thereafter by effective herbicide treatment, any gain would soon be overwhelmed by increased medusahead, capitalizing on new niches and newly released nutrients.

The recommended treatment for medusahead is a fall application of Plateau (Imazapic) at 6 oz/acre. Glyphosate can be used after germination in the fall or early in the spring but would injure any associated, desirable vegetation that is actively growing.

b. *Environmental Consequences:* Noxious Weeds and Invasive Nonnative Plant Species

For the purposes of this analysis, the CEAA for weeds is within the allotment boundary to encompass vegetative management and response controlled within in Happy Valley Allotment. The CEAA for this section does not incorporate surrounding areas where vegetation management could have different management objectives or landownership that dictates land management practices.

(1) Alternative I: No Action

Selection of the No Action Alternative would continue grazing each year during the critical growing season in the seeding pastures, which reduces the plant community's resistance to noxious weed introduction and spread. No rehabilitation of the native upland pastures would occur. These pastures are already at risk for noxious weed introduction and spread, particularly from medusahead. Riparian conditions would remain static or decline in Frog Creek which could lead to increased introduction and spread of noxious weeds in this riparian area.

(2) Alternative II: Proposed Action

The Vegetation Treatments Using Herbicides on BLM Lands in Oregon ROD October 2010 (Oregon Veg. ROD), Vegetation Treatments on BLM Lands in 17 Western States ROD September 2007 (National Veg. ROD), and the March 1, 2011 Order Amending Injunction [Case No. 83-cv-6272-AA (U.S. District Court)] provide new information that enable us to use Imazapic (Plateau) for the treatment of medusahead in the Burns District.

The Ecological Risk Assessments (ERAs) for Imazapic can be found in the National Veg. FEIS, Appendix C (pp. C-49). All applicable SOPs and Mitigating Measures from the Oregon Veg. ROD (Attachment A pp. 33-45) would be incorporated (Appendix C).

Plateau applied in the fall at 6 oz/acre (0.178125 lbs/acre of active ingredient Imazapic) just below the maximum rate of 0.1875 lbs/acre analyzed by the Oregon Veg. FEIS (CH 3, pp. 60) and National Veg. FEIS (Appendix C-9) was selected to treat the medusahead because it has effective short-term residual control on this noxious weed. There would be low risk to perennial non-target vegetation during fall treatments at a rate of 6oz/acre (Davies 2010).

Implementing the proposed riparian exclosure along Frog Creek would promote the establishment and maintenance of desired riparian vegetation in this area. Maintaining a healthy and productive riparian plant community would increase resistance to noxious weed introduction and spread.

Proposed rehabilitative seedings and changes in grazing management in the upland portions of this allotment would lead to an upward trend in upland plant communities. Periodic growing season rest from livestock grazing would help maintain functioning, vigorous, occupied plant communities' resistance to noxious weed introduction and spread. Range improvement projects designed to moderate livestock congregation and help spread animals on the landscape would reduce disturbance and, therefore, reduce opportunities for noxious weed introduction and spread.

Range improvements would also help spread horse use across the landscape, reducing concentrations and impacts from horses, contribute to enhancing desirable plant communities, and thus lessen opportunities for weed introduction and spread.

Any ground-disturbing activities associated with proposed range improvements have potential to create opportunities for noxious weed establishment and spread. Proposed fences, water developments, and pipelines are activities that could open up niches for weed introductions. Ensuring vehicles and equipment used to perform those activities are free of noxious weed seed or plant parts would aid in preventing new weed introductions to the sites. Those disturbed areas would be monitored closely for at least 3 years after projects are constructed. If weeds are found, they would be treated as soon as possible using the most effective and appropriate methods available.

The cumulative effects of the proposed projects would not impact the situation with noxious weeds because there are design elements in place to reduce the likelihood of spread.

(3) Alternative III: Change to Range Improvement

Effects would be the same as analyzed in Alternative II.

This action would have the same potential impacts to ecological trend, biodiversity, and frequency by implementing the suggested grazing management and range improvements as the Proposed Action except for range improvement "e." The methods and results would be similar to the Proposed Action, but at a smaller scale and would not fully address the issues identified in both pastures.

(4) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

Reducing 25 percent of the livestock AUMs would have no effect on weeds because livestock, horses, wildlife, and people still spread weeds. All other effects would be the same as analyzed in Alternative II.

(5) Alternative V: Shorten the Season of Use

Effects would be the same as analyzed in Alternative II.

(6) Alternative VI: Removal of Livestock Grazing

Removal of livestock grazing could help enhance desirable plant community diversity, productivity, and vigor which could reduce opportunities for noxious weed introduction and spread. Areas that are infested with medusahead would continue to persist and spread. Removing livestock from the allotment, implementation of range improvements depicted in the Proposed Alternative II would not occur, except for range improvement "e" depicted in Alternatives II and III and "f." Effects of installation of gap fences, inter-seeding and treatment of medusahead with Plateau would be the same as Alternatives II and III. Overuse of areas by wild horses can create opportunities for noxious weed introduction and spread.

5. Wildlife

a. *Affected Environment:* Wildlife

This allotment consists of several disconnected pastures stretching over a 24-mile distance from north to south. Elevation increases from north to south from a low of 4,160 feet in West Field Pasture to a high of 6,560 feet in Deep Creek at the extreme south end of the allotment. The lower elevation pastures in the north receive the least amount of precipitation at around 9 inches annually, while the highest elevations of Government and Deep Creek Pastures receive about 33 inches annually. Wildlife species use all vegetation communities within the allotment, including the lower elevation pastures where sagebrush steppe has been predominately converted to crested wheatgrass seedings. Perennial water sources, such as Frog Creek and Smyth Creek, and associated riparian habitat provide critical habitat for numerous wildlife species (Thomas et al. 1979), and there are 23 water developments across the allotment that provide water seasonally. Medusahead, a noxious weed is of little value to wildlife, and is present on over 173 acres of the allotment. Medusahead is a threat to existing wildlife habitat, and is primarily in the North Big Hill and South Big Hill Pastures at this time. Wildlife occurrence within the allotment varies by species and season, with some of the lower elevation pastures providing snow free areas earlier and later in the season while the upper elevations provide more succulent herbaceous vegetation later into the season.

No formal wildlife population or habitat monitoring has been conducted in the allotment, but suitable habitat is present for many species. Based on informal observations and vegetation communities present in the allotment (refer to Upland Vegetation Section), wildlife known or expected to occur include Rocky Mountain elk (*Cervus elaphus*), mule deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor*), American badger (*Taxidea taxidus*), black-tailed jackrabbit (*Lepus californicus*), and several smaller mammals, reptiles, lizards, and amphibians. These animals may reside in the allotment yearlong or on a temporary basis when foraging or passing through the area during daily or seasonal movements. Only big game species are covered in more detail.

Elk and mule deer occur throughout the allotment, but the pastures at the middle to lower elevations of the allotment provide critical winter habitat.

Approximately one-third of the allotment (5,700 acres) provides winter habitat for elk, and nearly two-thirds of the allotment (11,900 acres) provides winter habitat for mule deer, although this varies annually depending on snowpack. Shrubs generally comprise the bulk of mule deer diet in the area (Vavra and Sneva unpublished report), but research by Austin and Urness (1983) indicate crested wheatgrass regrowth may also provide winter forage. Pronghorn may be found at all elevations of the allotment during the year. In general, pronghorn migrate seasonally throughout the area spending winter months at lower elevations. Pronghorn tend to prefer more open habitats such as grasslands, low sagebrush, and open rolling terrain, but would use other habitats, such as big sagebrush, occasionally. Juniper provides winter forage and cover for all three species, but dense juniper encroachment degrades suitable habitat as the understory vegetation decreases.

Happy Valley Allotment makes up less than two percent of Oregon Department of Fish and Wildlife's (ODFW's) Steens Mountain wildlife management unit, and mule deer and elk populations across the unit are well below management objectives (Klus, personal communication).

Twenty-five and eighty-eight AUMs are allocated for deer and elk in the allotment, respectively. Four AUMs are allocated to pronghorn (Three Rivers RMP 1992, CMPA RMP, 2005, Appendix J).

Encroaching juniper was cut on 1,279 acres in the four northernmost pastures of the allotment to reduce competition with understory vegetation. About 1,000 acres of the juniper cut areas were followed up with a broadcast burn to stimulate a response to the herbaceous understory. Three wildfires in the early 1980s burned over 75 percent of Fisher Field and 3 percent of West Field Pastures, and another wildfire in 2006 burned across 141 acres of Deep Creek Pasture. Roads and fences can affect habitat use by big game animals, by creating barriers to travel and influencing use within the area. Overall, the allotment contains approximately 2.2 miles of fence per square mile and 1.4 miles of road per square mile.

b. *Environmental Consequences:* Wildlife

(1) *Effects Common to All Alternatives*

For the purposes of this analysis, the CEAA for wildlife extends up to 10 miles beyond the allotment boundary to encompass regular movements of most animals that may be using the allotment.

The CEAA does not incorporate the entire annual use area for some animals, such as wide-ranging elk, pronghorn, and mule deer, because this information is not available nor is it expected to change the analysis. Plant communities present in the allotment are representative of those across the CEAA.

Past and present actions and events have influenced the existing environment within the CEAA. RFFAs in the CEAA that may also contribute to cumulative effects to wildlife and habitat include livestock grazing, hunting and other recreational pursuits, and cutting and prescribed burning to reduce hazardous fuels and restore habitat. The majority of the past and future cutting and prescribed burning treatments were analyzed under the North Steens and Five Creeks Ecosystem Restoration Environmental Analysis documents. Reasonably foreseeable treatments specific to the allotment include piling and then burning previously cut juniper on up to 1,550 acres. The long-term (several decades) effect of these ecosystem restoration projects will improve the quality of wildlife habitat in the CEAA.

Table 12: Wildlife Past and Reasonably Foreseeable Future Actions in the Cumulative Effects Analysis Area affecting Wildlife and Wildlife Habitat

ACTION	PAST ACTIONS				FUTURE ACTIONS			
	ACRES	SQ. MILES	MILES	RATIO: Length to Area	ACRES	SQ. MILES	MILES	RATIO: Length to Area
Wildfires	116,604	182.2	---	---	Unknown	Unknown	---	---
Tree Cutting	32,038	50.1	---	---	19,366	30.3	---	---
Rx Burns	83,830	131.0	---	---	30,235	47.2	---	---
Seedings	111,852[1]	174.8	---	---	15,351[2]	24.0	---	---
Roads	---	---	1279	1.39:1	---	---	0	1.39:1
Fences	---	---	853	0.93:1	---	---	9	0.94:1

This list does not include unplanned or speculative actions. Seventy-two wildfire starts have occurred over the last 20 years and more are likely to occur in the next 20; however, predicting size and effects of future wildfires is not possible. [1] Approximately 85 percent of past seedings is crested wheatgrass, and the other 15 percent was a mix of native and nonnative grasses and shrubs for fire rehabilitation.[2] Approximately 60 percent of the future seeding is planned for rehabilitating previously seeded areas, and the other 40 percent is follow-up seeding of ground-disturbing projects with a mix if native and nonnative vegetation in treated areas.

Alternatives analyzed in this document may incrementally affect wildlife through disturbance and temporary reductions of herbaceous and shrub plant cover. Disturbance under each alternative would be limited to the period when cattle are present in the allotment, and (with the exception of Alternative I) grazing would be managed at utilization levels that achieve Rangeland Health Standards and conform to Guidelines which maintain existing habitat for wildlife across the allotment. Grazing would not occur before April or after October under any of the alternatives, and there would be no disturbance or displacement from cattle or grazing management activities during the critical winter season for big game.

No road construction or other actions that result in loss of habitat would occur. No more than 3 miles of new fence is proposed under any alternative. The fence-length-to-area ratio would remain virtually unchanged between alternatives, with a maximum increase of 0.1-mile per square mile and a maximum decrease (Alternative VI) of 0.2-mile of fence per square mile (currently at 2.2).

(2) Alternative I: No Action

The current grazing strategy is achieving all Standards for Rangeland Health for Wildlife (except Fisheries, Table 1 – Pastures and Riparian Exclosures in this Allotment where Standards were not Achieved). Scheduled rest and defer treatments would allow for maximum potential growth of herbaceous vegetation on 40 to 50 percent of the allotment annually. However, low elevation seeding pastures that are not currently meeting Standards for Watersheds-Uplands and for Ecological Processes, would continue to decline under the current scheduled rotation. Wyoming sagebrush and rabbitbrush would continue to invade the seedings, providing additional structure and diversity for wildlife cover and browse for big game and other species. Weakened crested wheatgrass plants may not provide adequate regrowth during the winter, decreasing the available forage in the pastures for mule deer and other wildlife.

Repeat early season grazing in West Field and Fisher Field Pastures would increase susceptibility to noxious weed establishment and facilitate spread to other areas, degrading intact native vegetation adjacent to the allotment. Medusahead in North Big Hill and South Big Hill, particularly in areas of heavy horse concentrations (Map H), would continue to spread unchallenged into adjacent intact native vegetation. As medusahead expands and outcompetes native vegetation, plant diversity and structure would eventually decrease, leaving poor cover and forage available for wildlife (Pyke 2000).

Frog Creek Exclosure would not be constructed, and livestock and wild horses would continue to have access to the creek and riparian vegetation. Livestock would have access during June and July for two consecutive seasons, and wild horses would have year-round access. Riparian vegetation, currently functioning at risk, would continue to be at risk from late season grazing. Plant communities may not progress toward their potential for diversity and cover important for numerous wildlife species. Livestock and wild horses would also continue to access Smyth Creek, and impacts to riparian vegetation may increase as juniper encroachment is removed and access to the creek is opened up under the Five Creeks Rangeland Restoration Project. Impacts could increase during periods of severe drought or when wild horse numbers exceed AML.

(3) Alternative II: Proposed Action

The proposed grazing strategy would continue to allow for maximum potential growth of herbaceous vegetation on 40 to 50 percent of the allotment annually, providing forage and cover for wildlife. Turnout in the lower elevation pastures would typically be delayed about 2 weeks compared to the current grazing schedule providing more growing time prior to the start of livestock grazing. The lower elevation pasture West Field currently not meeting Standards and Guides, would also be deferred in some years, allowing an even longer period of recovery for plants to store nutrients and put on new growth before livestock are scheduled to graze. The additional rest should help improve the vigor of plants in the seedings and native areas of these pastures, and still allow adequate regrowth following livestock grazing for winter forage for mule deer.

Brush beating the encroaching sagebrush and rabbitbrush on 940 acres of West Field Pasture would decrease the overall structural diversity of the crested wheatgrass seedings, but this would be offset by the subsequent follow-up seeding with a mixture of bluebunch wheatgrass, crested wheatgrass, and forage kochia. This mixture would maintain species diversity, help prevent noxious weed spread, and increase forage quality within the allotment, including winter forage for mule deer.

Increased ground disturbance, including heavy grazing and trampling, would occur around the proposed Skidoo trough.

The area impacted would be less than 1-acre, and occur along and existing fenceline between North Big Hill and South Pastures. The proposed water trough would improve livestock distribution across these two pastures, reduce the amount of time cattle concentrate at other water sources, and provide an additional water source for wildlife. The ground disturbance associated with the pipeline installation would affect only a few acres, and impacts to vegetation would last a few growing seasons as the seeded areas begin filling in the bare ground created during excavation. Wildlife, especially larger animals such as mule deer, may also be displaced from the immediate area during installation of the pipeline and trough. The work would be completed in less than a week, and displacement would be temporary. Risk of displacement would decrease as the distance from construction activities increases. Design features are in place to prevent the establishment and spread of noxious weeds in areas disturbed during construction, minimizing the risk of habitat degradation.

Livestock and wild horse impacts would be eliminated along Smyth Creek and the fenced portions of Frog Creek, allowing trees, shrubs, and herbaceous plants in these riparian exclosures to complete their growing cycles, increasing total vegetative structure and cover. Riparian areas, especially adjacent to perennial water sources, are limited on the landscape and provide critical habitat for species residing in the area or traveling between upland areas. The exclosure around Frog Creek and additional gap fences along Smyth Creek would protect water sources and riparian vegetation important for numerous species, from Pacific chorus frogs (*Pseudacris regilla*) to elk. The Frog Creek Exclosure would require less than 2 miles of fence, and Smyth Creek Exclosure would require only a few short gap fences to keep out wild horses and livestock.

Fencing around the creeks may alter movements or cause injury or even death for some wildlife (Harrington and Conover 2006), but design features for fence construction would increase the visibility and reduce the potential for injuries or entrapment of wildlife. Fences would be constructed to BLM standards for wildlife passage for mule deer and pronghorn. Vegetation would not be bladed to construct the fences, and no roads would be built adjacent to new fences. The additional fence would result in a negligible increase (0.07-mile per square mile) in the fence-length-to-area ratio in the allotment.

Seeding novel plant communities in North Big Hill and South Big Hill would affect wildlife habitat. Current vegetation consists of early seral native grasses and forbs that provide forage for wildlife at certain times of the year, and increases the opportunity for the spread of medusahead (Davies and Svecjar 2008). The planted communities would parallel the main access road through the two pastures, and this area provides habitat for numerous wildlife species such as mule deer residing in or migrating through the area. The seed mixture would consist of competitive native and nonnative herbaceous plants in an attempt to impede the spread of medusahead dominated sites, reduce the risk for wildfire associated with invasive annual grasses, and continue to provide and improve forage for wildlife. If successful, this treatment would be beneficial to all wildlife by reducing the rate of invasion by medusahead into adjacent areas of intact, deep-rooted, native perennial plant communities.

Herbicide treatments using Plateau in the fall at a rate of 6oz/acre would pose no risk to wildlife species (National Veg. FEIS pp. 4-103). 'Risk quotients for terrestrial wildlife were all below the most conservative Level of Concern (LOC) of 0.1, indicating that direct spray of Imazapic is not likely to pose a risk to terrestrial animals' (National Veg. FEIS pp. 4-105). The use of Plateau would help control medusahead and promote the establishment and growth of native and desirable nonnative plant species that provide more suitable wildlife habitat and forage.

(4) Alternative III: Change to Range Improvement "e"

Effects of livestock grazing and range improvements would be the same as those analyzed in the Proposed Action Alternative, with a slight change in the plant community proposal (improvement e).

The proposed seeding of native and nonnative plants adjacent to the roads in North Big Hill and South Big Hill would be reduced to 50 acres each and would be fenced. Proposed fences would be designed to reduce potential injury to larger wildlife species and allow passage into and out of the exclosures. The total increase in the length of fence under this alternative would be approximately 4.1 miles, but the fence-length-to-area ratio for the allotment would remain relatively low at 1.82 miles of fence per square mile. The fence around the 50-acre exclosures would be removed after two growing seasons, bringing the amount of fence, and consequently, the risk of injury and mortality to wildlife back to the same level as the Proposed Action.

(5) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

The effects of the livestock grazing rotation and proposed range improvements would be similar as the proposed alternative. However, wildlife would benefit more under this alternative due to the retention of more of the current year's growth and residual vegetation. The grazing schedule would be the same as the proposed alternative except with a reduced number of livestock, but more vegetation would remain ungrazed when cattle are moved out of each pasture. Comparatively more herbaceous vegetation and palatable branches of shrubs would remain, increasing the vertical and horizontal screening cover for reptiles and small mammals, and in turn increasing the prey base for badgers, coyotes, and other predators. Additional forbs, grass, and browse would also be available for elk, pronghorn, and mule deer, especially in critical wintering habitat that occurs in all pastures of Happy Valley except for Government Field and Deep Creek Pasture.

(6) Alternative V: Shorten the Season of Use

The effects of range improvements and grazing to wildlife and wildlife habitat would be the same as those discussed under the Proposed Action. Turning out in May instead of April would give plants the advantage of 2 to 3 weeks of growth per pasture on average before livestock grazing is scheduled relative to the Proposed Action, and up to 8 to 12 weeks in some pastures under the current schedule. Wild horses would remain in the allotment year-round, and their impacts would likely continue to be concentrated in the North Big Hill and South Big Hill Pastures (Map H). The proposed deferment of grazing would benefit upland vegetation communities compared to the previous alternatives. This delay in turnout would leave more succulent grasses and forbs later in the season for wildlife use.

(7) Alternative VI: Removal of Livestock

Elimination of livestock would remove grazing pressure and disturbance from cattle and associated management activities, and allow for maximum potential growth of herbaceous vegetation across the allotment outside of wild horse concentration areas (Map H). Bare ground around water developments and other livestock concentration areas would begin to recover as vegetation is allowed to grow without the pressure of livestock trampling and utilization. This alternative would provide the most vegetative screening, new growth, and residual vegetation for wildlife each year. Wild horses would still exert grazing pressure in the allotment, especially in intensively used areas identified in North Big Hill and South Big Hill Pastures. Horses also have yearlong access to Frog Creek, and although horse use appears minimal in this area at this time, continuous increases in the number of horses above AML combined with an extended period of drought may concentrate large numbers of animals in the riparian area, and the proposed exclosure would be built. This may lead to a downward trend in riparian vegetation, and severely degrade this perennial water source for many species. Removing cattle would not benefit areas infested with medusahead.

Removing interior fences would decrease the amount of fence within the allotment by about 4.9 miles, and would lower the fence-length-to-area ratio to 2.0 miles of fence per square mile. The current fence-length-to-area ratio (2.2:1) is relatively low compared to other areas (Connelly et al. 2004), and an additional decrease would further reduce the potential risk of injury or mortality to larger animals.

The seeding of native and nonnative plant communities and treatment of medusahead with Plateau would still occur, and effects would be the same as those described in the Proposed Action or Alternative III.

6. Migratory Birds

a. *Affected Environment:* Migratory Birds

No formal monitoring of migratory birds has been conducted within this allotment. Point Reyes Bird Observatory has conducted point counts in areas around the allotment, and observed 68 species. Most species are present only during the spring and fall migration and summer nesting season, although some species move into the area in the winter.

Common species observed or expected to occur in the allotment include American robin (*Turdus migratorius*), dark-eyed junco (*Junco hyemalis*), mourning dove (*Zenaida macroura*), Townsend's solitaire (*Myadestes townsendi*), horned lark (*Eremophila alpestris*), and mountain bluebird (*Sialia currucoides*). Raptors potentially nesting within the allotment and adjacent areas include Swainson's hawk (*Buteo swainsoni*) and red-tailed hawk (*Buteo jamiacensis*). Several Birds of Conservation Concern for the Great Basin Region inhabit the allotment, including Brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*), loggerhead shrike (*Lanius ludovicianus*), long-billed curlew (*Numenius americanus*), western burrowing owls (*Athene cunicularia*), and ferruginous hawk (*Buteo regalis*) (USFWS 2008).

Migratory birds use all habitat types in the allotment for nesting, foraging, and resting as they pass through on their yearly migrations. Species such as Brewer's sparrow and sage sparrow, tend to be found in sagebrush-shrubland habitats (Reynolds 1981), whereas long-billed curlew tend to be found in pastures where native vegetation has been converted to crested wheatgrass seedings (Pampush and Anthony 1993). The majority of migratory bird species utilizes a combination of several vegetation communities within their home range, and most rely to some extent on water and riparian vegetation associated with perennial and semi-perennial creeks (Thomas et al. 1979). Medusahead is present on over 800 acres of the allotment, primarily in the North Big Hill and South Big Hill Pastures, and is a threat to existing habitat for migratory birds across the allotment and adjacent areas.

As part of the Five Creeks Rangeland Restoration Project effort, juniper encroachment was cut on almost 1,500 acres in the four southernmost pastures of the allotment to reduce competition with understory vegetation. About a thousand acres of the juniper treated areas were followed up with a broadcast burn to stimulate a vigorous response to the herbaceous understory. Restoration efforts would initially increase the amount of grassland habitat in the area, and restore degraded sagebrush communities in one to two decades as sagebrush vegetation recovers naturally. Three wildfires in the early 1980s burned over 75 percent of the Fisher Field and 3 percent of West Field Pastures. The most recent wildlife in the allotment occurred in 2006, and burned across 141 acres of Deep Creek Pasture affecting more of the sagebrush vegetation and increasing the amount of grassland habitat.

Other past actions potentially affecting migratory birds are road and fence construction. All of the roads in the allotment are natural surface roads with slow, infrequent traffic, and effects migratory birds would be limited to birds flushing from the area as vehicles pass rather than collisions. There are 43 miles of road within the allotment for a ratio of 1.4 miles of road per square mile.

Fences within the allotment can cause mortality to flying birds (Allen and Ramirez 1990), although the ratio of 2.2 miles of fence per square mile is low relative to other areas (Connelly et al. 2004). Overall, the allotment contains approximately 2.2 miles of fence per square mile and 1.4 miles of road per square mile.

b. *Environmental Consequences:* Migratory Birds

(1) *Effects Common to All Alternatives*

For the purposes of this analysis, the CEAA for migratory birds extends up to 10 miles beyond the allotment boundary to encompass regular movements of some wider ranging migratory birds that may be using the allotment when they are present in the area. The CEAA does not include the entire annual use area because this information is not available nor is it expected to change the analysis. Plant communities present in the allotment are fairly representative of those across the CEAA, although there are more open water bodies available in the larger CEAA.

Past and present actions and events, such as those described in *Affected Environment*, have influenced the existing environment within the CEAA. RFFAs in the CEAA that may contribute to cumulative effects to migratory birds and habitat include livestock grazing, hunting and other recreational pursuits, and cutting and prescribed burning to reduce hazardous fuels and restore habitat. The majority of the past and future cutting and prescribed burning treatments in the CEAA were analyzed under the North Steens and Five Creeks Ecosystem Restoration Environmental Analysis documents. Reasonably foreseeable treatments specific to the allotment include piling and then burning previously cut juniper on up to 1,550 acres. The long-term (several decades) effect of these ecosystem restoration projects will improve the quality of migratory bird habitat in the CEAA. Past and RFFAs that have affected migratory birds or habitat in the CEAA are found in Table 12 (Wildlife Section).

Alternatives analyzed in this document may incrementally affect migratory birds through disturbance and temporary reductions of herbaceous plants and shrub cover.

Disturbance would be limited to periods when cattle occupy the allotment, and grazing would be managed at levels that achieve Rangeland Health Standards and Guidelines to maintain adequate habitat for migratory birds.

No road construction or other actions that result in loss of habitat are proposed in any alternative, and no more than 3 miles of new fence is proposed under any alternative. The alternatives analyzed would not likely contribute to detectable cumulative effects to migratory birds, because loss of vegetative structure and cover to livestock grazing would be temporary (lasting until vegetation grows back), managed to maintain adequate forage and cover for birds, and not lead to an irreversible loss or alteration of habitat.

(2) Alternative I: No Action

The current grazing strategy is achieving all Standards for Rangeland Health for Wildlife (except Fisheries, Table 1 – Pastures and Riparian Exclosures in this Allotment where Standards were not Achieved), and maintaining adequate habitat to support migratory birds. However, the 2005 allotment evaluation also indicated that Standards were at risk of not being achieved for wildlife in the future due to inadequate growing season rest in the seeding pastures and the establishment and spread of medusahead in several pastures throughout the allotment. Standards for Watersheds-Uplands and for Ecological Processes are not currently being met in the low elevation seeding pastures, and if the current grazing rotation is followed then habitat conditions for migratory birds would also be at risk.

Wyoming big sagebrush and rabbitbrush would continue to increase the crested wheatgrass seedings, increasing the shrub cover. The additional structure would provide more nesting sites and foraging habitat for a greater number of migratory bird species (McAdoo et al. 1989). The number of shrub nesting species would increase and grassland associated species such as long-billed curlew would also likely remain unless the shrub component becomes too dominant (Pampush and Anthony 1993).

Repeat early season grazing in West Field and Fisher Field Pastures would increase the rate of shrub invasion, but would also increase the susceptibility of the pastures to noxious weed establishment and spread which would gradually degrade existing habitat within these pastures for most migratory birds.

Scheduled rest and defer treatments would allow for maximum potential growth of herbaceous vegetation on 40 to 50 percent of the pastures at the middle and upper elevations each year, maintaining adequate habitat for migratory birds in these areas.

Frog Creek Exclosure would not be constructed, and livestock and wild horses would continue to have access to the creek and riparian vegetation. Livestock would have access during June and July for two consecutive seasons, and wild horses would have year-round access. Riparian vegetation, currently functioning at risk, would continue to receive inadequate rest from grazing, and plant communities subject to late season grazing would not progress toward PFC (Kauffman et al. 1984). Livestock and wild horses would also continue to access Smyth Creek, and impacts to riparian vegetation may increase as access to the creek is opened up under the Five Creeks Rangeland Restoration Project.

Spring grazing scheduled in the low elevation pastures, such as West Field and Fisher Field, increases potential for reducing herbaceous screening cover at nests and disturbing birds on nests, which in turn may increase the risk of nest abandonment. Livestock grazing in the spring also increases potential for disturbance or flushing of ground nesting birds. Management of the lower elevation pastures with seedings is primarily for livestock forage, and these areas are typically utilized more than pastures with native vegetation (Table 3), leaving less residual forage for ground nesting birds. Trampling of nests may occasionally occur; however, based on research by Guthery and Bingham (1996), the impact to ground nesting birds, especially those that nest near the base of sagebrush and other shrub vegetation, is not expected to affect populations.

Medusahead would not be treated with herbicides and would continue to be a threat to migratory bird habitat, especially if a large wildfire occurs within the allotment.

(3) Alternative II: Proposed Action

The proposed grazing strategy would continue to allow for maximum potential growth of herbaceous vegetation on 40 to 50 percent of the allotment each year. Turnout in the lower elevation pastures would typically be delayed about 2 weeks compared to the current grazing schedule, and some pastures currently not meeting Standards and Guides, such as West Field, would also be deferred longer in some years allowing more time for plants to grow, store nutrients, and recover from past use before livestock are scheduled to graze. Ground nesting species would benefit the most from deferred grazing due to the reduced potential for trampling and loss of screening cover around nests at least earlier in the season. Brush beating the encroaching sagebrush and rabbitbrush on 940 acres of West Field Pasture would decrease the overall structural diversity of the crested wheatgrass seedings in the short term. This would be offset by the subsequent follow-up seeding with a mixture of bluebunch wheatgrass, crested wheatgrass, and forage kochia. This seed mixture would provide a more stable fire resistant and resilient plant community from converting to an annual grassland. Improving this plant community's structural cover and forage, and help slow the spread and/or the introduction of noxious weeds would increase the level of habitat values. Livestock grazing in Deep Creek and Government Field would continue to be deferred, providing migratory birds adequate time to nest and raise a brood to fledging.

Increased ground disturbance, including heavy grazing and trampling, would occur around the proposed Skidoo trough. The area impacted would be less than 1-acre, and occur on the fenceline between North Big Hill and South Pastures. The trough would provide an additional source of water for some species, and an escape ramp would be installed to reduce potential mortality from drowning. The ground disturbance associated with the pipeline installation would affect only a few acres, and loss of vegetation would last a few growing seasons as the seeds germinate and begin filling in the bare ground. Migratory birds may also be displaced during installation of the pipeline and trough.

Displacement would be temporary, because the work would be completed in less than a week, and birds would likely return to the area upon completion of the project. Risk of displacement would decrease as the distance from construction activities increases, and effects would be indiscernible for most birds further than a quarter to half mile from the project. Design features are in place to prevent the establishment and spread of noxious weeds in areas disturbed during construction.

Livestock and wild horse use would be eliminated along Smyth Creek and the fenced portions of Frog Creek, allowing trees, shrubs, and herbaceous plants in these riparian exclosures to complete their growing cycles, increasing total vegetative structure and cover. Improvements that protect water sources and adjacent riparian habitat for forbs and insect prey would be beneficial for migratory birds (Dobkin et al. 1998), especially during periods of severe drought. The Frog Creek Exclosure would require less than 2 miles of fence, and Smyth Creek Exclosure would require only a few short gap fences to prevent wild horses and livestock access. All new fences would be constructed with steel posts to minimize potential perch sites for red-tailed hawks (*Buteo jamaicensis*) and other large raptors, but the steel posts and barbed-wire would increase available perch sites for western meadowlarks (*Sturnella neglecta*) and other passerines. Vegetation would not be bladed to construct the fences, and no roads would be built adjacent to new fences. Fewer than 2 miles of fence would be added. The additional fence would result in a negligible increase (0.07 miles per square mile) in the fence-length-to-area ratio in the allotment which is already low (2.2:1), but may increase the risk of mortality to flying birds.

Seeding native and nonnative plant communities proposed in Alternative II in North Big Hill and South Big Hill could affect up to 300 acres of existing migratory bird habitat. Vegetation at the proposed sites consists of early seral native grasses and forbs, with a substantial component of medusahead. Although medusahead is present, the proposed areas still provide suitable foraging habitat for several species, and limited nesting habitat for ground nesting species within an approximate 300 acres in the two pastures. If successful, this treatment would be beneficial to migratory birds and other wildlife.

Herbicide treatments using Plateau in the fall at a rate of 6oz/acre would pose no risk to wildlife species (National Veg. FEIS pp. 4-103). "Risk quotients for terrestrial wildlife were all below the most conservative LOC of 0.1, indicating that direct spray of Imazapic is not likely to pose a risk to terrestrial animals" (National Veg. FEIS pp. 4-105). Imazapic poses no risk to sensitive wildlife under all exposure scenarios analyzed in ERAs (National Veg. FEIS pp. 4-122). The use of Plateau would help control medusahead and promote the establishment and growth of native and desirable nonnative plant species that provide more suitable habitat for migratory birds.

(4) Alternative III: Change to Range Improvement "e"

Effects of livestock grazing and range improvements would be the same as those analyzed in the Proposed Action Alternative, with a slight change in the plant community proposal (improvement e).

The proposed seeding of native and nonnative plants adjacent to the roads in North Big Hill and South Big Hill would be reduced to 50 acres each and would be fenced. The total increase in the length of fence would be approximately 4.1 miles, but the overall fence-length-to-area ratio for the allotment (2.3:1) would remain relatively low (Connelly et al. 2004). The fence around the 50-acre exclosures would be removed after two growing seasons, bringing the total amount of fence and the risk of collision to migratory birds back to the same level as the Proposed Action.

(5) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

The effects of the livestock grazing rotation and proposed range improvements would be the same as the proposed alternative. However, migratory bird nesting and foraging habitat would be slightly improved under this alternative due to the retention of more of the current year's growth and residual vegetation. The presence of more herbaceous vegetation within each pasture would not only increase the available vertical and horizontal screening cover, but would retain more forbs and habitat for insect prey, which are critical for most species of birds during the brood-rearing phase.

(6) Alternative V: Shorten the Season of Use

The effects of range improvements and grazing to migratory birds and habitat would be the same as those discussed under the Proposed Action.

Turning livestock out in May instead of April would give plants 2 to 3 weeks of growth in each pasture before livestock begin grazing relative to the Proposed Action, and up to 8 to 12 weeks in some pastures under the no action schedule. Wild horses would remain in the allotment year-round, and impacts would likely be concentrated in the North Big Hill and South Big Hill Pastures (Map H). Grazing would be deferred the longest and provide the most rest to upland vegetation compared to the previous alternatives, although the improvement to habitat over the Proposed Action would be negligible overall. The proposed rotation would also result in a reduction of between 58 and 161 AUMs in Government Field and Deep Creek combined, compared to the current and proposed rotations. This reduction would yield an increase of current year's vegetative growth available for migratory bird nesting cover and foraging habitat at these higher elevation areas, and allow more standing residual vegetation for subsequent years nesting cover.

(7) Alternative VI: Removal of Livestock

Elimination of livestock would remove grazing pressure and disturbance from cattle and associated management activities, and allow for maximum potential growth of herbaceous vegetation across the allotment outside of wild horse concentration areas (Map H). Bare ground around water developments and other livestock concentration areas would begin to recover as vegetation is allowed to grow without the pressure of livestock trampling and utilization. This alternative would provide the most vegetative screening and forage available for migratory birds across the allotment each year. Wild horses would still exert grazing pressure, especially in heavily used areas identified in North Big Hill and South Big Hill Pastures.

Horses would still have yearlong access to Frog Creek, and although horse use appears minimal in this area, an increase in numbers as observed in recent history combined with an extended period of drought may concentrate large numbers of animals in the riparian area. This could lead to a downward trend in riparian vegetation, which could decrease or degrade the quality of existing migratory bird habitat.

Removing interior fences would decrease the amount of fence within the allotment by about 4.9 miles, and would lower the fence-length-to-area ratio to 2.0 miles of fence per square mile. The current fence-length-to-area ratio (2.2:1) is relatively low compared to other areas (Connelly et al. 2004), and an additional decrease would further reduce the potential risk of mortality to flying sage-grouse.

The seeding of native and nonnative plant communities and treatment of medusahead with Plateau would still occur, and effects would be the same as those described in the Proposed Action or Alternative III.

7. Special Status Species

a. *Affected Environment:* Special Status Species – Fauna

There are no Federally listed Threatened or Endangered wildlife species found within Happy Valley Allotment.

The allotment provides habitat for greater sage-grouse (*Centrocercus urophasianus*), a BLM designated SSS, Bird of Conservation Concern for the Great Basin Region, and a U.S. Fish and Wildlife Service (USFWS) candidate species. The allotment contains one lek site, and 14 more leks occur within 10 miles of the allotment. All 14 leks are at least 4.5 miles from the allotment boundary. Ten of the leks occur east of the allotment and four more occur west of the allotment. The Dollar Lake lek is located near the middle of the Government Field Pasture, and had 28 males displaying in 2010.

Government and Deep Creek Pastures are within 3 miles of a sage-grouse lek (Dollar Lake lek), and are considered yearlong habitat for grouse. Half of the allotment is classified as either yearlong or probable habitat (seasonal usage uncertain) for sage-grouse. Nearly 80 percent of this habitat is found from North and South Big Hill, and South Pastures to the pastures in the extreme south of the allotment. The remainder of the allotment contains potential habitat, but has been degraded by sagebrush conversions to grasslands, fires, or juniper encroachment.

An allotment evaluation in 2005 determined this allotment was meeting the Standards for Rangeland Health for Wildlife (exception of Fisheries Habitat, Table 1 – Pastures and Riparian Exclosures in this Allotment where Standards were not Achieved), but was at risk due to medusahead presence, high intensity year-round wild horse use, and late season livestock and wild horse access to Frog Creek (Table 2 – Standards and Guides achieved – at risk). Medusahead, a noxious weed, has invaded more than 800 acres of potential sage-grouse habitat in the allotment, with high concentrations in the North Big Hill and South Big Hill Pastures where wild horses tend to frequent.

Sage-grouse are highly susceptible to West Nile virus (WNv) (Clark et al. 2006), and sage-grouse mortality may be as high as 100 percent (Naugle et al. 2004). WNv is primarily transmitted by infected mosquitoes, and was first detected in southeastern Oregon near Burns Junction in 2006, and then later near Crane and Jordan Valley that same year. Total mortalities have markedly declined since 2003, and WNv has not been detected near the project area or in southeast Oregon since the first observations in 2006 (DeBess 2009).

Encroaching juniper was cut on almost 1,550 acres of the four southernmost pastures to reduce competition with understory vegetation, including areas immediately adjacent to the Dollar Lake lek. About 1,000 acres of the juniper treatment areas were followed up with a broadcast burn to stimulate a vigorous response to the herbaceous understory. Restoration would continue as sagebrush recovers naturally in these areas.

A wildfire in 2006 burned across 141 acres of Deep Creek Pasture, reducing the cover of sagebrush. Other past actions potentially impacting sage-grouse are roads and fence construction. All of the roads in the allotment are natural surface roads with slow, infrequent traffic, and effects to grouse would be limited to birds flushing from the area as vehicles pass rather than collisions. There are 43 miles of road within the allotment for a ratio of 1.4 miles of road per square mile. Fences within the allotment can cause mortality to flying birds (Allen and Ramirez 1990), although the ratio of 2.2 miles of fence per square mile is low relative to other areas (Connelly et al. 2004).

b. *Environmental Consequences:* Special Status Species – Fauna

(1) *Effects Common to All Alternatives*

For the purposes of this analysis, the CEAA for sage-grouse extends up to 10 miles beyond the allotment boundary to encompass regular movements of sage-grouse that may be using the allotment. The CEAA does not include the entire annual use area because this information is not available nor is it expected to change the analysis. Vegetation communities present in the allotment are representative of those within the CEAA, although the CEAA provides a slightly higher percentage of yearlong and probable habitat (seasonal usage uncertain) for sage-grouse.

Past and present actions and events, such as those described in *Affected Environment*, have influenced the existing environment within the CEAA. RFFAs in the CEAA that may also contribute to cumulative effects to sage-grouse and habitat include livestock grazing, hunting and other recreational pursuits, and cutting and prescribed burning to reduce hazardous fuels and restore habitat. The majority of the past and future cutting and prescribed burning treatments were analyzed under the North Steens and Five Creeks Ecosystem Restoration Environmental Analyses.

Reasonably foreseeable treatments specific to the allotment include piling and then burning previously cut juniper on up to 1,550 acres. Two hundred and forty acres of cut juniper would be piled and burned adjacent to the Dollar Lake lek, providing immediate benefits to sage-grouse in the area. The long-term (several decades) effect of these ecosystem restoration projects will improve the quality of habitat for SSS in the CEAA. Past and RFFAs that affect sage-grouse or habitat in the CEAA are found in Table 12 (Wildlife Section).

Disturbance under each alternative would be limited to the period when cattle are present in the allotment. Sage-grouse nesting and early brood rearing would not be affected because most sage-grouse nest within 4 miles of a lek (Connelly et al. 2004), and the only pastures within this distance of a lek are Deep Creek and Government Field. These two pastures are deferred from grazing under each alternative until at least mid-July.

No road construction or other actions that result in loss of habitat are proposed in any alternative, and no more than 3 miles of new fence is proposed under any alternative. The fence-length-to-area ratio would be virtually unchanged between alternatives (a maximum increase of 0.1-mile per square mile). No fences are proposed within the 0.6-mile buffer recommended in ODFW's sage-grouse strategy (Hagen 2005). Sage-grouse mortality from WNv has markedly declined since 2003, and the only detection in southeastern Oregon occurred in 2006. If WNv were detected in the perennial and semi-perennial water sources near the allotment, such as Dry Lake or Malheur Lake, then movement of WNv into the allotment would be a concern. The alternatives proposing to construct one new water source would have no measurable affect to suitable mosquito larval habitat; therefore, the risk of WNv spread would be virtually unchanged between alternatives. None of the alternatives would contribute to measurable cumulative effects to sage-grouse, because the decrease of herbaceous vegetative cover from livestock grazing would be temporary, would sustain adequate forbs and screening cover, and would not lead to an irreversible loss or alteration of habitat.

(2) Alternative I: No Action

The current grazing strategy is achieving all Standards for Rangeland Health for Wildlife (except Fisheries, Table 1 – Pastures and Riparian Exclosures in this Allotment where Standards were not Achieved). Scheduled rest and defer treatments would allow for maximum potential growth of herbaceous vegetation on 40 to 50 percent of the allotment every year. West Field, a low elevation crested wheatgrass seeded pasture that is not currently meeting Standards for Watersheds-Uplands and for Ecological Processes, would continue to decline if the current scheduled rotation is followed. Wyoming sagebrush and rabbitbrush would continue to invade the seedings, but would require several years before reaching cover densities suitable for sage-grouse. Repeat early season grazing in West Field and Fisher Field Pastures would also increase the susceptibility of the pastures to noxious weed establishment and spread. Sagebrush vegetation present in these low elevation seeded pastures consists of small, fragmented patches that are not contiguous with the larger acreages of sagebrush present in the higher elevation pastures that provide suitable sage-grouse habitat. The continued downward range trend in these pastures would not have much impact to sage-grouse and current habitat. There is potential risk if noxious weeds become established and move up into higher elevation pastures in the surrounding area as cattle are moved between pastures.

Frog Creek Exclosure would not be constructed, and livestock and wild horses would continue to have access to the creek and riparian vegetation. Livestock would have access during June and July for two consecutive seasons, and wild horses would have year-round access. Riparian vegetation, currently functioning at risk, would continue to receive inadequate rest from grazing, and plant communities subject to late season grazing would not progress toward their potential for diversity and cover. Livestock and wild horses would also continue to access Smyth Creek, and impacts to riparian vegetation may increase as access to the creek is opened up under the Five Creeks Rangeland Restoration Project. Sage-grouse use of these areas is unknown, but potential reductions of forbs and insect habitat may affect birds, especially during periods of severe drought when grouse may concentrate in these areas.

Medusahead infestations in North Big Hill and South Big Hill Pastures would continue to spread unchallenged into adjacent intact native vegetation. As medusahead expands and outcompetes native vegetation, large areas would be converted to annual grasslands, which are unsuitable for sage-grouse.

(3) Alternative II: Proposed Action

The proposed grazing strategy would continue to allow for maximum potential growth of herbaceous vegetation, which provides vertical and horizontal screening cover for sage-grouse, on 40 to 50 percent of the allotment each year. Deep Creek and Government Field are the only two pastures within 4 miles of a known lek (Dollar Lake lek), and grazing would have the most potential to affect sage-grouse in this area. Livestock grazing would occur 2 weeks earlier in these two pastures adjacent to the Dollar Lake lek, and an additional 32 AUMs would be scheduled in Deep Creek Pasture. The earlier grazing schedule in these two pastures would still occur after the critical nesting and early brood-rearing period for sage-grouse. Late season grazing would eliminate potential for flushing of birds off nests and trampling nests and young, although the typical placement of nests directly under shrubs minimizes trampling from occurring.

Increased ground disturbance, including heavy grazing and trampling, would occur around the proposed Skidoo trough.

The area impacted would be less than 1-acre, and occur on the fenceline between North Big Hill and South Pastures. The proposed water trough would further improve livestock distribution across these two pastures. The ground disturbance associated with the pipeline installation would affect only a few acres, and effects to vegetation would last two growing seasons as the seeds germinate and begin filling in the bare ground. Sage-grouse may also be displaced during installation of the pipeline and trough. The work would be completed in less than a week, and potential displacement would be temporary. Risk of displacement would decrease as the distance from construction activities increases, and effects would be indiscernible for birds further than a half mile from the project. Design features are in place to prevent the establishment and spread of noxious weeds in areas disturbed during construction.

Livestock and wild horse impacts would be eliminated along Smyth Creek and the fenced portions of Frog Creek, allowing trees, shrubs, and herbaceous plants in these riparian exclosures to complete their growing cycles, increasing total vegetative structure and cover. Sage-grouse use of these areas is unknown, but improvements that protect water sources and adjacent habitat for forbs and insects would be beneficial for grouse, especially during periods of severe drought. The Frog Creek Exclosure would require less than 2 miles of fence, and Smyth Creek Exclosure would require only a few short gap fences to keep out wild horses and livestock. No fences would be constructed within 6 miles of a sage-grouse lek, and all new fences would be constructed with steel posts to minimize potential perch sites for sage-grouse predators, such as golden eagles (*Aquila chrysaetos*). Vegetation would not be bladed to construct the fences, and no roads would be built adjacent to new fences. Fewer than 2 miles of fence would be added, which would result in a negligible increase (0.07-mile per square mile) in the fence-length-to-area ratio in the allotment.

Seeding the native and nonnative plant communities in North Big Hill and South Big Hill would have no direct affect to sage-grouse or sage-grouse habitat. Vegetation at the proposed sites consists of early seral native grasses and forbs, with a substantial component of medusahead. The planted communities would parallel the main access road through the two pastures, which currently provide marginal foraging habitat for sage-grouse. The seed mix would consist of competitive native and nonnative herbaceous plants in an attempt to slow the spread of medusahead.

If successful, this treatment would be beneficial to sage-grouse by slowing the rate of medusahead spread into adjacent areas of intact, native, deep-rooted perennial plant communities suitable for sage-grouse foraging and nesting.

Herbicide treatments using Plateau in the fall at a rate of 6oz/acre would pose no risk to SSS (National Veg. FEIS pp. 4-121). Imazapic poses no risk to sensitive wildlife under all exposure scenarios analyzed in ERAs (National Veg. FEIS pp. 4-122). Plateau would help control medusahead and promote the establishment and growth of native plant species that provide suitable sage-grouse habitat and forage.

(4) Alternative III: Change to Range Improvement "e"

Effects of livestock grazing and range improvements would be the same as those analyzed in the Proposed Action Alternative, with a slight change in the plant community proposal (improvement e).

The proposed seeding of native and nonnative plants adjacent to the roads in North Big Hill and South Big Hill would be reduced to 50 acres each and would be fenced. The total increase in the length of fence would be approximately 4.1 miles, but the fence-length-to-area ratio for the allotment (2.3:1) would remain relatively low (Connelly et al. 2004). The fence around the 50-acre exclosures would be removed after two growing seasons, bringing the total amount of fence and risk of collision to sage-grouse back to the same level as the Proposed Action.

(5) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

The effects of the livestock grazing rotation and proposed range improvements would be the same as the proposed alternative. However, sage-grouse would benefit more under this alternative due to the retention of more of the current year's growth and residual vegetation. The presence of more herbaceous vegetation within each pasture would not only increase the available vertical and horizontal screening cover, but would retain more forbs and habitat for insects, which are important to sage-grouse during the spring and summer months (Drut et al. 1994, Gregg and Crawford 2009).

(6) Alternative V: Shorten the Season of Use

The effects of range improvements and grazing to sage-grouse and sage-grouse habitat would be the same as those discussed under the Proposed Action. Turning out in May instead of April would give plants 2 to 3 weeks of growth in each pasture before livestock begin grazing relative to the Proposed Action, and up to 8 to 12 weeks in some pastures under the current schedule. Wild horses would remain in the allotment year-round, and impacts would likely be concentrated in the North Big Hill and South Big Hill Pastures (Map H). Deferring grazing would benefit upland vegetation compared to the previous alternatives. The grazing schedule would be similar to the current rotation and only about a week or two later than the proposed rotation for Deep Creek and Government Field Pastures, which are by Dollar Lake lek. However, the shortened season would result in a reduction of total AUMs in these two pastures combined between 58 and 161 AUMs compared to the current and proposed rotations. Reduced AUMs would increase current year's vegetation growth available for grouse cover and foraging habitat in these two pastures, and allow more standing residual vegetation for subsequent years nesting cover.

(7) Alternative VI: Removal of Livestock

Elimination of livestock would remove grazing pressure and disturbance from cattle and associated management activities, and allow for maximum potential growth of herbaceous vegetation across the allotment outside of wild horse concentration areas (Map H). Bare ground around water developments and other livestock concentration areas would begin to recover as vegetation is allowed to grow without the pressure of livestock trampling and utilization. This alternative would provide the most vegetative screening and forage available for sage-grouse across the allotment each year. Wild horses would still exert grazing pressure, especially in heavily used areas identified in North Big Hill and South Big Hill Pastures. Horses would still have yearlong access to Frog Creek, and although horse use appears minimal in this area, an increase in numbers as observed in recent history combined with an extended period of drought may concentrate large numbers of animals in the riparian area. This may lead to a downward trend in riparian vegetation, which may affect foraging habitat for sage-grouse and their broods.

Removing interior fences would decrease the amount of fence within the allotment by about 4.9 miles, and would lower the fence-length-to-area ratio to 2.0 miles of fence per square mile. The current fence-length-to-area ratio (2.2:1) is relatively low compared to other areas (Connelly et al. 2004), and an additional decrease would further reduce the potential risk of mortality to flying sage-grouse.

The seeding of native and nonnative plant communities and treatment of medusahead with Plateau would still occur, and effects would be the same as those described in the Proposed Action or Alternative III.

8. Livestock Grazing Management

a. *Affected Environment:* Livestock Grazing Management

There is one Term Grazing Permit that authorizes 2,107 AUMs of cattle use in the Happy Valley Allotment. This allotment is made up of 10 pastures and 2 riparian exclosures described in Chapter I. The current grazing management schedule is described in Chapter II, Alternative I: No Action. However, adaptive management was administered in the West Field Pasture since the 2005 evaluation, which implemented a change from a graze only to a graze and defer rotation. This has resulted in an improvement in crested wheatgrass vigor, seedling establishment, and frequency. In the past two grazing seasons Deep Creek Pasture was rested following the implementation of the Five Creeks Rangeland Restoration Project in 2009 and livestock were provided alternative forage on private property adjacent to the Happy Valley Allotment. Future juniper treatments are scheduled to occur in 2011-2013 in South and South Big Hill Pastures.

b. *Environmental Consequences:* Livestock Grazing Management

(1) Alternative I: No Action

Under the No Action Alternative there would be no new range improvements. Current management would continue and perennial grazing during critical growth periods in the 4-year rotation on crested wheatgrass seedings would further the degradation of these pastures. Without range improvements the potential for the decrease in ecological trend would be highly probable caused by the spread of exotic noxious weedy species primarily medusahead (Davies 2008). With the expansion of exotic annual grasses livestock AUMs would eventually decline in those pastures identified in Chapters I and II.

The expansion of exotic annual grasses would not only reduce livestock AUMs, but wild horses and wildlife habitat values such as mule deer and elk within the allotment.

(2) Alternative II: Proposed Action

The Proposed Grazing Management Schedule would provide a graze, defer, and rest rotation for upland vegetation within this allotment. The new grazing rotation would provide key forage plants the opportunity to grow, store carbohydrates, and reseed in each pasture. This would result in an increased upland and ecological trend for this allotment and for areas that did not meet Standards or that are at risk, and maintain the allotted AUMs for the livestock permit.

(a) Range Improvements:

i) In general the Frog Creek Exclosure would not inhibit use and distribution by livestock within the South Big Hill Pasture. Utilization data indicates little to no use in the uplands adjacent to Frog Creek both on the canyon sides and along the top of the canyon on both sides because of the steep terrain and rimrock. Most access and passage within the Frog Creek area by livestock and wild horses is evident down and up the canyon along the creek, along the road, upstream of the road, and 560 feet downstream of the road before entering the canyon. Of the four trailing passages mentioned two would be impacted by the fence, which would be down the canyon of Frog Creek and the trailing area 560 feet downstream of the road that crosses this creek. Removing access to the canyon would meet the objectives to improve stream and riparian condition and not inhibit the distribution of livestock and wild horses. Removing access at the downstream crossing would inhibit trailing by livestock and wild horses at this location.

However, this trail originates from the road north of the stream crossing and then within 430 feet ties back into the road after crossing the stream. Access along the road would allow adequate distribution and movement throughout this pasture. The Five Creeks Rangeland Restoration Project would improve access and movement of both livestock and wild horses following the removal of the juniper trees in this area.

The water trough just on the downstream side of the road would provide a perennial source of water for livestock, wild horses, and wildlife. Access to the length of Frog Creek for watering purposes is not necessary to maintain livestock distribution and available water in the South Big Hill Pasture.

ii) Crested Wheatgrass Seeding maintenance and rehabilitation using crested wheatgrass, bluebunch wheatgrass, and forage kochia in the West Field and North Pastures would improve perennial plant density, ground cover, and available forage for livestock and wildlife (Greenhalgh et al. 2009). The objective for the maintenance, rehabilitation, and a change in grazing management is to maintain livestock AUMs, and provide a plant community that functions to support a diverse flora of BSCs and reduce the potential for invasion by noxious weeds. After rehabilitation these two pastures would be rested for two growing seasons. However, the long-term benefits would be improved forage quality and quantity for both early and late season use, and improved trend to upward.

iii) Skidoo Spring Water Development would benefit livestock distribution in both the South and North Big Hill Pastures. The trough would be placed on the fenceline separating both pastures in an area that is not well watered. Providing water in this area would improve livestock distribution and alleviate pressure in other watered areas. Also, using a trough rather than constructing a reservoir would provide a cleaner and more reliable source of water.

iv) Smyth Creek Exclosure would not have any impacts to livestock use since this area already excludes livestock use. However, there are areas along the east rim of Smyth Creek that have not been gap fenced where livestock could potentially access the creek.

v) Establish two plant communities comprised of native and nonnative plant species with one in South Big Hill Pasture (130 acres) and one in North Big Hill Pasture (170 acres), and temporarily remove wild horses and livestock grazing from these two pastures for two growing seasons (Map H). This would impact livestock use for two growing seasons, which would be mitigated by flexibility in pasture rotations or by providing alternative forage on other public or private lands. The benefits that would follow both treatments would be a plant community more resistant to invasion by annual exotic grasses, more plant diversity and structure across these seeded areas and improved forage for livestock (Clements et al. 1997; Monaco et al. 2003; Stevens et al. 1985; Waldron et al. 2006).

vi) No affect – No risk to livestock (National Veg. FEIS pp. 4-127).

(3) Alternative III: Change to Range Improvement "e"

This action would have the same potential impacts to livestock management as the Proposed Action except for range improvement "e." In this alternative the two seedings would be smaller, 50 acres each, and temporarily fenced. Both livestock and wild horses would be allowed to use each pasture during the 2-year rest period since treatment areas would be fenced to exclude use. This would remove the need for alternative forage or from having to temporarily manipulate the grazing rotation during the 2 years of rest for plant establishment.

(4) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

This action would have the same potential impacts to livestock management by implementing the suggested grazing management and range improvements as the Proposed Action.

The main effect of reducing the permitted AUMs by 25 percent would result in poorer livestock distribution. Heavily used or preferred use areas would remain as they are, lightly used areas would get less use. In an allotment such as Happy Valley, which is stocked below carrying capacity as additional livestock are removed, the result is remaining livestock have more ability to show individual preference for forage and locations. Preferred areas would continue to be used as much as before numbers were reduced. Reduced stocking rates could provide more flexibility in pasture use and rotation. The advantage of reduced AUMs is most evident during drought years when available water and forage are limited. However, issues identified were a result in reoccurring time of use by livestock during the growing season year after year and not the number of livestock or over utilization of key forage plants. Furthermore, since the implementation of adaptive management in the last 5 years pastures such as West Field, rangeland condition has improved.

(5) Alternative V: Shorten the Season of Use

This action would have the same potential impacts to livestock management by implementing the suggested grazing management and range improvements as the Proposed Action.

Shortening the season of use from April 1 to October 15 to May 1 to October 15 would allow a month of plant growth prior to livestock turnout. This would result in a grazing schedule with more pastures receiving deferred grazing on upland vegetation throughout the grazing season. By reducing the amount of use by livestock during the growing season would potentially reduce animal performance by limiting the consumption of plants that are more nutritious, palatable, and digestible. This grazing schedule would also reduce the flexibility for both the permittee and management by the BLM especially in years of drought and early springs. Furthermore, shortening the season of use would not have measurable increases to plant vigor and production. Also, in the past 9 years livestock turnout dates have been middle to late April. These dates fluctuate from year-to-year provided by the flexibility in the current AMP, which are most often dependent upon climatic conditions of that year.

(6) Alternative VI: Removal of Livestock

Under this alternative, the current grazing permit would be cancelled.

Under this alternative, no additional range improvements would be completed unless they were deemed necessary for management of wild horses to move toward achieving Standards. Existing range improvements (i.e., internal pasture fences – refer to Map K) in place for livestock grazing management would be removed by Burns District BLM wild horse program to facilitate wild horse movement. However, as mentioned in the Upland Vegetation Section 4.9 miles of fence would be removed from this allotment. The boundary fences would be maintained by permittees on adjacent allotments or adjacent private landowners. Existing riparian exclosures (i.e., Smyth Creek Exclosure and Riddle Exclosure) would be maintained by the BLM.

Effects of installation of gap fences, inter-seeding and treatment of medusahead with Plateau would be the same as Alternatives II and III.

9. American Indian Traditional Practices

a. *Affected Environment:* American Indian Traditional Practices

The allotment is located within a pre-Contact and modern American Indian Traditional Use area. Some members of the Burns Paiute Tribe have ancestors one to two generations back that lived in the Diamond area and probably used the allotment in their seasonal economic activities. The allotment is likely rich in geophytic root crops such as bitterroot and varieties of biscuitroot harvested in spring and early summer. However, the Burns District BLM is not aware of specific locations important to the Burns Paiute Tribe in general or some of the families that make up its membership.

In recent comments concerning the North Steens Right-of-Way (ROW) Draft EIS (Comment 158.11), the chair of the Tribal Council made the following statement about Steens Mountain:

"From the review of the draft Environmental impact statement; it is apparent that any option in moving forward with the North Steens 230-kV Transmission Line Project will have some level of negative effect to the cultural and spiritual integrity of the Steens Mountain and its viewshed."

Judging from this statement, it appears that the Burns Paiute Tribal Council regards Steens Mountain as an important cultural and spiritual place.

b. *Environmental Consequences:* American Indian Traditional Practices

None of the alternatives advocate increased grazing in the allotment and impacts to gathering geophytic root crops would not change. Proposed range developments are site-specific and may be within areas of importance to the Burns Paiute Tribe, but none were identified.

10. Cultural Resources

a. *Affected Environment:* Cultural Resources

Approximately 30 percent (4,980 acres) of the Federal lands within the Happy Valley Allotment have been inventoried for cultural resources. Seeding rehabilitation, reservoir construction, an exclosure fence, two juniper reduction projects and a wild horse trap have been inventoried. The allotment has a high probability for containing high value archaeological resources because it is fairly well watered and has widespread upland lithosols containing edible root crops. The allotment was used for root gathering and hunting, especially in the last 2,000 to 4,000 years. Use prior to that may have been focused on the lower elevations of the allotment, especially those portions closest to Diamond Valley.

Twenty three sites have been documented in the allotment. Twelve sites are prehistoric sites devoted to stone tool manufacture and maintaining hunting tools. Four sites are more complex and also involve plant food processing and maybe longer term camps. Five sites contain prehistoric and historic material (usually refuse). One site is a refuse dump dating to the early 20th century and one site is the remains of a cabin also dating to the early 20th century. According to site records 22 of 23 (96 percent) of sites have been impacted (from surface scuffing 2 inches deep to hoof shear 12 inches deep) by livestock and/or wild horse grazing. However, the severity and extent of impacts have not been quantified. Nine sites have been impacted by vandalism (either illegal surface collection or excavation), three sites have been affected by road construction and use, one site has been affected by reservoir construction and subsequent livestock use, one site has been affected by exclosure fence construction and one site has been included in a juniper cut. The most common impacts to sites are livestock trampling and water erosion.

The Happy Valley Allotment has been grazed by sheep, cattle, and wild horses for up to 130 years. In former times, prior to the Taylor Grazing Act of 1935, grazing on public lands was essentially uncontrolled. After the Taylor Grazing Act, the allotments were tied to base property, essentially shutting out the former grazers without property and reducing the number of livestock on public lands. This situation exerted some control over grazing on public lands which continued to be the responsibility of the Grazing Service. Under the Grazing Service and then under the new BLM in 1946, the number of grazing managers was very low, the number of grazers was high and the pattern of grazing was undoubtedly more intense than today. Even as late as the early 1960s, grazing levels were considerably higher than today because the grazing management infrastructure had not been developed to the degree we have today. Cultural resources sites were affected more intensely and to a greater depth in the past than under the more refined, controlled grazing management of practices of today.

Based on field observations by BLM cultural resources staff over the last 16 years, the estimated average grazing effects on cultural resource sites has occurred in the top 12 inches of sediment. These effects are seen as plant pedestalling, hoof shear and surface scuffing. The deepest disturbance is seen in congregation areas where concentrated hoof shear is most common. Generalized grazing, where light hoof shear and scuffing are the most common effects, has produced light (2 inches) to moderate (6 inches) damage. The logical conclusion leading from these observations is that most sites have sustained a certain amount of grazing effects over the years. What we see outside of congregation areas, is actually effects to previously disturbed portions of sites. As a result, current grazing practices have little effect on cultural resource sites except when sites fall within congregation areas.

Observation and geomorphological factors lead to the conclusion that congregation areas (either current or future) are the only location of ongoing livestock grazing effects to cultural resource sites. The reoccurring cycle of ground disturbance, absence of vegetative cover along with water and wind erosion leads to continued loss of sediment. Cultural materials anywhere within the top 12 inches of the sediment column would eventually be exposed to surface trampling. When cultural materials are exposed to surface trampling, site integrity would be reduced.

New methods of spreading grazing impacts more evenly over the allotment are not likely to increase the effects on cultural resources except where new congregation areas could arise. New congregation areas could arise due to spring developments, new water trough placements, changes in the fencing pattern within the allotment and new exclosure fences around riparian areas or formerly unfenced spring developments. It is in these areas around new range developments or changes to old ones that new effects (particularly hoof shear) detrimental to cultural resources can be seen.

b. *Environmental Consequences:* Cultural Resources

(1) Factors Common to All Alternatives

Grazing effects by livestock or wild horses, except in congregation areas, are negligible under each alternative.

(2) Alternative I: No Action

Under the No Action Alternative, cultural resources would not be affected, except when they are located in existing congregation areas.

(3) Alternative II: Proposed Action

Under the Proposed Action Alternative, cultural resources would not be affected by grazing effects except in existing and new congregation areas that might arise near proposed range developments.

Frog Creek Exclosure, Smyth Creek Exclosure, and Skidoo Spring Development are the projects in the Proposed Action that could create new congregation areas where existing or undiscovered cultural resources would be affected by livestock and wild horse impacts (primarily hoof shear). All range developments would be inventoried prior to construction and the best method to minimize or eliminate effects to nearby cultural resources would be to ensure they are inside the exclosure fences. Including cultural sites within exclosure fences would increase the area within the exclosure and length of fence. However, the increased expense for including cultural sites within exclosure fences is offset by the savings from not requiring additional mitigation measures to protect the sites from hoof shear.

Other pasture improvement projects such as seeding maintenance and seeding pastures to increase species diversity would affect cultural resources during application of the seeds. These seedings would be inventoried for cultural resources prior to implementation. Mitigation of effects by rangeland drilling to cultural resources could be avoidance or seeding via All-Terrain Vehicles (ATVs) dragging a lightweight harrow. The minor effects of seeding via ATV and harrow would be artifact displacement and, possibly, artifact breakage. However, these effects are far outweighed by the soil (and site) stability achieved by planting soil holding species.

(4) Alternative III: Change to Range Improvement "e"

The effects to cultural resources under Alternative III would be the same as the Proposed Action.

(5) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

Alternative IV has less effects on cultural resources than the Proposed Action because potential new congregation areas created and existing ones could potentially receive lighter use.

(6) Alternative V: Shorten the Season of Use

Alternative V has less effects on cultural resources than the Proposed Action because potential new congregation areas created and existing ones would be used when sediments might be drier depending on the year's climatic conditions and more resistant to hoof shear.

(7) Alternative VI: Removal of Livestock

Alternative VI would have less effect on cultural resources than the Proposed Action because no new congregation areas would be created and existing congregation areas would only be by wild horses.

11. Kiger Mustang Area of Critical Environmental Concern and Herd Management Area

a. *Affected Environment:* Kiger ACEC and HMA

The Happy Valley Allotment is part of the Kiger ACEC and HMA. The Kiger ACEC was established in 1996 and designated in the Three Rivers ROD in Chapter 2-140 of the PRMP/FEIS, Wild Horse and Burro Program, 2-44 Objective and Rational, and the Steens Mountain CMPA RMP Pages 50-52 and 68-71.

The Kiger HMA is comprised of 30,293 total acres of public and private lands that allocates 984 AUMs for wild horses, and the Kiger ACEC includes both the Kiger and Riddle Mountain HMAs that is comprised of 68,044 total acres of public and private lands. The primary objective of the Kiger Mustang ACEC is to perpetuate and protect the dun factor color and conformation characteristics typical of wild horses currently present in the Kiger and Riddle Mountain HMAs. Management actions of the HMAP and of the AMPs would be the means to perpetuate the horses and maintain their habitat. The HMAP states that horse habitat objectives for maintaining or improving the vegetative, water, and soil resources (horse habitat) upon which horses are dependent for survival are the same as the "resource objectives" listed in the AMPs for Smyth-Kiger, Happy Valley, and Burnt Flat Allotments. Horse herd objectives in the HMAP for the Kiger HMA are to maintain a healthy and sustainable herd of 51 to 82 wild horses that exhibit the dun factor colors and physical characteristics of Spanish Mustang horses that currently exist in the HMA. Two pastures in the Happy Valley Allotment are managed as part of the HMA and ACEC, which are South Big Hill and North Big Hill.

Within the Happy Valley Allotment horse observations were few to nonexistent prior to 1999 prescribed burn in South Big Hill Pasture. Since the burn, horses have been documented in this area for the past 11 years. Since 1999, all documented sightings from horse inventory flights and on-the-ground observations have exceeded the set AML of 11 animals by two to three fold. In the 1990s observations identified few wild horses present in both pastures. In the last 10 years AML has exceeded the 132 AUMs allocated by as much as 208 AUMs in 2002 inventory, 408 AUMs in 2003 inventory, 456 AUMs in the 2007 gather, and 132 AUMs in the 2010 inventory. The data indicates horse numbers have exceeded the AML for Happy Valley Allotment for the past 10 years except for the year following the 2007 gather date.

The most recent Kiger HMA inventory was completed April 12, 2010, which counted 81 adults and 10 foals for a total of 91 horses in both the Happy Valley and Smyth-Kiger Allotments (Table 13). Of this total 18 adults and 4 foals were counted in the Happy Valley Allotment, which is equivalent to 264 AUMs. Through documented horse observations and inventory wild horses in these two pastures are comprised of two bands. The larger band (14) has been primarily observed in the South Big Hill Pasture in a specific area see Map H. The smaller band (8) has primarily been observed in the North Big Hill Pasture in the 170-acre treatment area on Map H. These two locations on Map H have received high intensity, frequency and duration of continuous year-round grazing by wild horses. The next gather date is scheduled for the fall of 2011.

Table 13: Kiger Herd Management Area Inventory, April 12, 2010

Ref. No.	Allotment	Pasture	Adults	Foals	Total	Comments
1	Smyth-Kiger	Ruins	4	1	5	
2	Smyth-Kiger	Wood Camp	4	0	4	
3	**Happy Valley**	**South Big Hill**	**12**	**2**	**14**	
4	**Happy Valley**	**North Big Hill**	**6**	**2**	**8**	
5	Smyth-Kiger	Ant Hill	4	0	4	
6	Smyth-Kiger	Wood Camp	5	1	6	
7	Smyth-Kiger	Wood Camp	15	2	17	2 Bays
8	Smyth-Kiger	Wood Camp	1	0	1	
9	Smyth-Kiger	Wood Camp	10	0	10	
10	Smyth-Kiger	Wood Camp	4	0	4	
11	Smyth-Kiger	Yank Springs	3	0	3	
12	Smyth-Kiger	Yank Springs	6	1	7	1 Bay
13	Smyth-Kiger	Yank Springs	3	1	4	
14	Smyth-Kiger	Yank Springs	2	0	2	
15	Smyth-Kiger	Yank Springs	2	0	2	1 Bay
		Totals	81	10	91	

Kiger ACEC and HMA are also within the Five Creeks Rangeland Restoration Project area. Acres treated within the ACEC are approximately 10,340 and RFFA acres to be treated are 11,890. Once the Five Creeks Rangeland Restoration Project has been fully implemented total acres treated in the ACEC would equate to approximately 22,230.

The BLM is preparing an EIS in response to a transmission line ROW application in association with wind energy development on private lands (Echanis Project) on the northern end of Steens Mountain. One alternative (C) would cross public and private lands to the north of the Echanis site adjacent to, but outside of the Happy Valley Allotment boundary. However, this route would traverse the northwest portion of the Kiger ACEC (7.27 miles) and HMA (4.46 miles). The potential acres impacted by the transmission line would be 132.2 acres in the ACEC and 81.1 acres in the HMA. Other potential impacts would be the construction of 2.41 miles of road in the HMA, 39 line poles in the HMA, and 64 line poles in the ACEC. The ROW, although an RFFA, is still in process and subject to changes. Following the construction of the transmission line horses would have access to this area, and there would be no impacts to either the dun factor color or available habitat. The transmission line's infrastructure would impact visual resources.

b. *Environmental Consequences:* Kiger ACEC and HMA

(1) *Effects Common to All Alternatives*

For the purposes of this analysis, the CEAA for wild horses is the ACEC boundary. The CEAA for this section does not incorporate surrounding areas where horse management could have different management objectives or landownership that dictates horse management practices.

Past and present actions and events have influenced the existing environment within the CEAA. RFFAs in the CEAA that may contribute to cumulative effects to wild horses include livestock grazing, Five Creeks Rangeland Restoration Project cutting and prescribed burning 11,890 acres of juniper, and treatment of invasive exotic plant species. Past and RFFAs that have affected wild horses in the CEAA are found in Table 14.

Table 14: Kiger Areas of Critical Environmental Concern Past and Reasonably Foreseeable Future Actions

ACTION	PAST ACTIONS				FUTURE ACTIONS			
	ACRES	SQ. MILES	MILES	RATIO: Length to Area	ACRES	SQ. MILES	MILES	RATIO: Length to Area
Wildfires	5,370	8.4	---	---	Unknown	Unknown	---	---
Rx Burns	10,340	16.2	---	---	11,890	18.5	---	---
Seedings	95	0.15	---	---	---	---	---	---
Roads	---	---	145	1.4:1	---	---	7.3	1.4
Fences Total	---	---	108	1.01:1	---	---	---	---
Fences Interior	---	---	41	0.39:1	---	---	---	---
Fences Perim.	---	---	67	0.63:1	---	---	---	---
North Route	---	---	---	---	132.2	0.20	---	---

(2) Alternative I: No Action

Under the No Action Alternative there would be no range improvements. Without range improvements the potential for the decrease in ecological trend would be highly probable caused by the spread of exotic noxious weedy species primarily medusahead (Pyke 2000; Davies 2008). With the expansion of exotic annual grasses wild horse habitat would eventually decline in those pastures identified in Chapters I and II. The expansion of exotic annual grasses would not only reduce wild horses AUMs, but livestock and wildlife habitat values for mule deer and elk. If management does not address medusahead, it would continue its spread not only in adjacent plant communities, but to other pastures, allotments and throughout the Kiger HMA and ACEC depriving wild horses, livestock, and wildlife of key forage species and habitat (Davies and Svejcar 2008; Pyke 2000; Mangla *In Press*). Observations indicate that these medusahead-infested areas have been highly desirable to wild horses since the 1999 prescribed fire that removed both sagebrush and juniper trees. Pictures and recorded observations indicate that areas identified by Map H receive the highest frequency of use by wild horses that can lead to more grazing resistant forbs and exotic plants (Beever et al. 2007), which is where medusahead has primarily been identified. Wild horse AUMs have exceeded the AML in this allotment by as much as two to three fold. Horse numbers are predicted to continue to exceed the AML due to documented annual reproductive rates and timing in-between gathers.

(3) Alternative II: Proposed Action

The Proposed Grazing Management Schedule would provide a graze, defer, and rest rotation for upland vegetation within this allotment. This would result in an increased upland ecological trend for this allotment including areas that did not meet standards or that are at risk. North Big Hill and South Big Hill Pastures would have periods of complete rest from livestock reducing any potential competitive relations such as dietary and/or behavioral overlap between cattle and wild horses.

(a) Range Improvements:

i) Project "a" Frog Creek Exclosure would not inhibit the use and distribution by wild horses within the South Big Hill Pasture or objectives mentioned in the affected environment. Utilization data, horse observations and inventory, and horse sign indicates little to no use in the uplands adjacent to Frog Creek both on the canyon sides and along the top of the canyon on both sides. Trailing along the road and above the road would allow adequate distribution and movement throughout this pasture. In conjuncture to animal distribution within the Frog Creek area is the Five Creeks Rangeland Restoration Project, which would improve access and movement of wild horses following the removal of the juniper trees in this area.

The water gap/trough just on the downstream side of the road would provide a perennial source of water for wild horses.

ii) Project "b" Crested Wheatgrass Seeding maintenance and rehabilitation is outside of the Kiger ACEC and HMA boundary and would have no impact on wild horses.

iii) Project "c" Skidoo Spring Water Development would potentially benefit wild horse distribution in North Big Hill Pasture. The trough would be placed on the fenceline separating South and North Big Hill Pastures in an area that is not well watered.

An alternative water source could alleviate pressure from wild horse use in other watered areas of this pasture. Also, using a trough rather than constructing a reservoir would provide a cleaner and more reliable source of water.

iv) Project "d" Smyth Creek Exclosure would not have any impacts to wild horse use since this area already excludes wild horses and livestock use. However, there are areas along the east rim of Smyth Creek that have not been gap fenced where wild horses could potentially access the creek, but there has been no evidence of this occurring in current or past years.

v) Project "e" This treatment and Alternative III would impact wild horse management for two growing seasons following implementation. Establish two plant communities comprised of native and nonnative plant species with one in South Big Hill Pasture(130 acres) and one in North Big Hill Pasture (170 acres), and temporarily remove wild horses and livestock grazing from these two pastures for two growing seasons (Map H). Following the 2011 gather horses would not be returned to these two pastures. They would be selected for adoption or returned to the Riddle Mountain HMA. The minimal AML of 51 horses of the Kiger HMA would be released into the Smyth-Kiger Allotment. The benefits of successful treatments would be a plant community more resistant to invasion by medusahead, more plant diversity and structure, and improved forage for wild horses (Clements et al. 1997; Monaco et al. 2003; Stevens et al. 1985; Waldron et al. 2006). Temporarily removing wild horses and livestock during this time would also allow juniper cut, pile and burn treatments and reseeding post Five Creeks Rangeland Restoration Project to occur without large herbivore impacts by both wild horses and livestock. The end result would be improved habitat resilience for wild horses.

vi) Project "f" No Affect – No risk to wild horses or burros (National Veg. FEIS pp. 4-140).

(4) Alternative III: Change to Range Improvement "e"

This action would have the similar impacts to wild horse management by implementing the suggested grazing management and range improvements as the Proposed Action except for range improvement "e. Establish two plant communities comprised of native and nonnative plant species with one in South Big Hill Pasture (50 acres) and one in North Big Hill Pasture (50 acres), and temporarily exclude wild horses and livestock grazing from these 50-acre treatment sites for two growing seasons by constructing a fence around each site." Wild horses would be allowed to use each pasture during the 2-year rest period since treatment areas would be fenced to exclude use. However, as mentioned in the Upland Vegetation environmental consequences this would be a smaller area that would have reduced potential in protecting the area from the continued invasion of medusahead rye and would not meet the objectives for juniper treatments described in the Proposed Action for reseeding and plant recovery.

(5) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

Reducing the permitted AUMs by 25 percent would have little effect on grazing intensity on pastures in the allotment. The main effect on wild horses would be areas with light livestock use, but moderate wild horse use. Reduction of cattle could potentially decrease social pressure and/or grazing competition between horses and cattle. As a result these specific areas could become more attractive to wild horses. Issues identified were a result in reoccurring time of use by livestock during the growing season year after year and not the number of livestock or over utilization of key forage plants. Utilization reports have not shown heavy livestock use in North Big Hill and South Big Hill Pastures. Areas that utilization reports have quantified heavy use are identified in Map H.

(6) Alternative V: Shorten the Season of Use

This action would have the same potential impacts to wild horse management by implementing the suggested grazing management and range improvements as the Proposed Action.

(7) Alternative VI: Removal of Livestock

Under this alternative, the current grazing permit would be cancelled. This action would have the same potential impacts to wild horse management as implementing Range Improvement "e" stated in Alternative II (Proposed Action) or Alternative III.

Juniper management activities within Five Creeks Project area would continue in parts of the allotment. Range Improvement "e" for Alternative II or Alternative III would be implemented. Wild horse management would remain the same and grazing by these animals would still occur in the North Big Hill and South Big Hill Pastures. Under this alternative, no other range improvements would be completed unless they were deemed necessary for management of wild horses to move toward achieving Standards. Existing range improvements (i.e., internal pasture fences – refer to Map E) in place for livestock grazing management would be removed by Burns District BLM wild horse program to facilitate improved wild horse distribution. However, as mentioned in the Upland Vegetation Section very little fence would be removed from this allotment (4.9 miles) and 2.2 miles within the Kiger ACEC and HMA that separates North Big Hill and South Big Hill Pastures. The allotment boundary fences would be maintained by permittees on adjacent allotments or adjacent private landowners. Existing riparian exclosures (i.e., Smyth Creek Exclosure and Riddle Exclosure) would be maintained by the BLM.

Effects of installation of gap fences, inter-seeding and treatment of medusahead with Plateau would be the same as Alternative II.

12. Recreation and Visual Resources

a. *Affected Environment:* Visual and Recreation Resources

(1) Visual Resources

The Happy Valley Allotment falls into Visual Resource Management (VRM) Class 4. The intention of VRM Class 4 is to allow management activities which may dominate the view and be the major focus of viewer attention.

This project area provides a panoramic vista with undulating topography and several drainages. The color varies seasonally from a grey/green to tan/brown. Juniper, sagebrush/grassland, and riparian plant communities make up the flora of this landscape.

Grazing management activities have occurred in this project area including fences, reseeding, crested wheatgrass seedings, and juniper treatments. These range improvements can vary in appearance across the landscape.

(2) Recreation

The primary recreation activities in the Happy Valley project area are dispersed camping and hiking. These activities are usually associated with hunting big game such as mule deer, Rocky Mountain elk, and pronghorn antelope. Upland game bird hunting occurs occasionally. Other recreation activities are rock-hounding, photography, wildlife viewing, wild horse viewing, and driving for pleasure.

b. *Environmental Consequence*s: Visual and Recreation Resources

For the purposes of this analysis, the CEAA for visual and recreation resources is within the allotment boundary to encompass management controlled within in Happy Valley Allotment. The CEAA for this section does not incorporate surrounding areas where management could have different management objectives or landownership that dictates land management practices.

(1) Alternative I: No Action

(a) Visual Resources:

Effects to visual resources under the No Action Alternative short term would be minimal. However, current livestock grazing management is producing areas in a downward trend, and these areas are expected to increase due to medusahead spread. These situations may be visually noticeable to the casual observer.

(b) Recreation:

Hiking associated primarily with hunting big game and wild horse viewing are the main form of recreation in this allotment. The No Action Alternative would make no effort to improve at risk riparian areas or upland areas at risk due to invasive species. If no changes are made in livestock grazing and wild horse management, a reduction in available forage for big game, livestock, and wild horses could occur. Reductions in big game habitat could diminish recreational hunting opportunities.

Reductions in wild horse forage could also diminish wild horse viewing opportunities.

(2) Alternative II: Proposed Action

(a) Visual Resources:

The Proposed Action is designed to improve overall health of the allotment while achieving multiple resource objectives. Visual intrusions created by development of range improvements are acceptable under the VRM class within the allotment. Overall long-term benefit to rangeland health initiated successful implementation of the proposed range improvements would outweigh the attention they would attract by the casual observer in the short term. Happy Valley Allotment is remote and not visible from any highway or main road.

i) Range Improvements:

a) Frog Creek Exclosure would provide Frog Creek the opportunity to improve hydrologic conditions and riparian function. The visual effects of the constructed fence would, in time, be offset by the improvement to the riparian area. In other words the new growth and vitality would add a more natural appearing creek with a visually appealing color, line, form, and texture.

b) Crested Wheatgrass Seedings: The color, form, and texture would be changed with this treatment, in the short term the visual character could be noticeable. However, as the seedings become established this would create a new form and color that would blend in with and compliment the surrounding landscape.

c) Skidoo Spring Water Development: The trench construction would create a linear aspect to the landscape that would be noticeable by the casual observer. As the seeding takes (crested wheatgrass and forage kochia) it would create a contrast to the surrounding landscape (Wyoming big sagebrush plant community). However this would improve wild horse and livestock distribution which would have a visual affect as the rangeland responds to this action.

d) Smyth Creek Exclosure: The nature of this intermittent gap fence and the remote location would not noticeably affect the visual quality of this area.

e) Establish two plant communities: The establishment of two plant communities would effectively have no visual impact to the casual observer as it would essentially only change the plant species and not the line, form, color or texture of the area.

f) Treat Medusahead with Plateau: Low risk because treatments would be short term (1-year/treated site) (National Veg. FEIS pp. 4-155). Plateau would remove only invasive annual weeds leaving established perennial vegetation on the treated site further reducing any impacts to visual resources.

(b) Recreation:

Recreation impacts would be of a temporary nature and would only affect wild horse viewing for the period of two growing seasons while the horses are removed. The benefits of the establishment of the two plant communities would become apparent to the wild horse viewer in the return of horses after the second growing season. Following establishment of seedings wildlife forage and habitat would improve resulting in increased hunting and wildlife viewing opportunities.

(3) Alternative III: Change to Range Improvement "e"

(a) Visual Resources:

This action would have the same potential impacts to the Visual Resources as implementing the suggested grazing management and range improvements as the Proposed Action except for range improvement "e."

The establishment of the two smaller plant communities would alter the visual component by the addition of fencing on the two pastures. In this panoramic landscape with the existing conditions this would not have an effect on overall landscape quality and would not be out of character in this landscape.

(b) Recreation:

The impacts would be the similar as the effects analyzed for the Proposed Action except for horses would not be temporarily removed for two growing seasons from the allotment. There would be no impact to wild horse viewers.

(4) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

(a) Visual Resources:

The impacts would be the same as the effects analyzed for the Proposed Action.

(b) Recreation:

The impacts would be the same as the effects analyzed for the Proposed Action.

(5) Alternative V: Shorten the Season of Use

(a) Visual Resources:

The impacts on the landscape would be the same as the effects analyzed for the Proposed Action.

(b) Recreation:

The impacts on the landscape would be the same as the effects analyzed for the Proposed Action.

(6) Alternative VI: Removal of Livestock

(a) Visual Resources:

Removal of livestock grazing under this alternative would be followed by removal of internal fences within Happy Valley Allotment. Nevertheless, some range improvement projects would remain necessary for management of wild horses. Visual resources would basically be unaffected by this alternative because remaining range improvements would still blend into the panoramic setting.

(b) Recreation:

Under Alternative VI, the main effect to recreation would be the lack of road maintenance as the livestock grazing permittee, who maintains roads in this allotment, would abandon this duty. Vehicular movement around the allotment would eventually become more difficult as roads degrade with lack of maintenance. However, this alternative could provide better wildlife and wild horse viewing as livestock interaction is removed from public land in the allotment.

13. Social and Economic Values

a. *Affected Environment:* Social and Economic Values

Livestock raising and associated feed production industries are major contributors to the economy of Harney County. The highest individual agricultural sales revenue in the county is derived from cattle production (65 percent), which is inextricably linked to the commodity value of public rangelands. The cattle industry provided $37,955,000 in sales in Harney County in 2009 compared to $42,973,000 in 2008 [Oregon State University (OSU), Extension Service, 2010].

"Quality of life" is very individual when determining what is valued in a lifestyle and what features make up that lifestyle. Lifestyle features can be determined by historical activities of the area, career opportunities and the general cultural features of the geographical area. Quality of life issues are subjective and can be modified over time with exposure to other ways of living. Recreation is a component of most lifestyles in the area and includes driving for pleasure, camping, backpacking, fishing, hunting, hiking, horseback riding, photography, wildlife viewing, and sightseeing. These activities contribute to the overall quality of life for residents.

The primary recreation activities in the Happy Valley Allotment are dispersed camping and hiking. These activities are usually associated with hunting big game and upland game bird hunting occurs occasionally. Other recreation activities are rock-hounding, photography, wildlife viewing, wild horse viewing, and driving for pleasure.

In addition to local recreation use, the undeveloped, open spaces in the county are themselves a tourist attraction and contribute a "sense of place" for many. The attachment people feel to a setting, typically through a repeated experience, provides them with this sense of place. Attachments can be spiritual, cultural, aesthetic, economic, social or recreational.

Hunting and other types of dispersed outdoor recreational experiences contribute to the local economy on a seasonal basis. Fee hunting and recreation alone contributed $110,000 to Harney County in 2009 (http://oain.oregonstate.edu, 2009).

b. *Environmental Consequences: Social and Economic Values*

(1) *Effects Common to All Alternatives*

RFFAs such as grazing, recreational pursuits, horse gathers, noxious weed treatments and cutting and prescribed burning to reduce hazards fuels and restore habitat would continue under all alternatives. Implementation of any of the alternatives in combination with the above listed RFFAs is not expected to measurably contribute to cumulative effects. The North Steens 230-kV Transmission Line Project, although an RFFA, is still in process and subject to change based on public comments in future NEPA analysis and subsequent administrative remedies. The effects of this RFFA combined with the effects of this project would affect social and economic values in Harney County.

Expected effects include hiring of local residents during construction of the wind farm, transmission line, and rangeland improvements. In turn, wages would be spent in the local communities, particularly Burns and Hines, Oregon. Local residents of Diamond would see job opportunities including jobs during the maintenance phase of the wind farm.

(2) Alternative I: No Action

Public lands in and around the project area would continue to contribute social amenities such as open space and recreational opportunities (including hunting, hiking, and camping). These amenities enhance local communities and tourism, though the specific contribution of the project area is not known. The Federal government would continue to collect grazing fees (2,107 AUMs @ $1.35/AUM = $2,844.45) from the permittee and this commodity use on public lands would continue to generate revenues for the Federal government and private sector. No new range improvements would be constructed; therefore, no revenues to the local communities would be generated from these activities.

(3) Alternative II: Proposed Action

The Proposed Action would allow the permittee to graze 2,107 AUMs with an annual payment to the Federal government of $2,844.45. This alternative could generate approximately $107,595 through purchase of supplies and provide economic opportunities to the local communities (primarily Burns and Hines).

The permittee would remove his cattle from the South Big Hill and North Big Hill Pastures for two growing seasons in association with the Kiger horse gather expected in fall 2011. The permittee would have to rest and/or find replacement forage for 700 AUMs/year equaling approximately $19,880.00 (700 AUMs x $14.20 /Oregon Average Private Land Lease Rate/AUM x 2 years). This additional expense to the permittee could affect quality of life during these 2 years. However, rangeland conditions would improve enhancing forage for livestock.

Developments are designed to achieve Rangeland Health Standards and allow conformance to Guidelines by providing periodic rest to upland vegetation and better cattle distribution improving rangeland conditions. Treatment of medusahead with Plateau would also improve rangeland conditions. This improved condition would enhance recreational opportunities such as hunting and wildlife viewing.

(4) Alternative III: Same Actions as Alternative II Except for a Change to Range Improvement "e"

Effects would be similar to the Proposed Action, except an additional $22,370.00 would be spent to create the two 50-acre temporary exclosures and the permittee would not have to find replacement forage.

(5) Alternative IV: Reduction in AUMs by Reducing Livestock Numbers

Effects would be similar to the Proposed Action except the Federal government would receive 25 percent less in payment of AUMs. The permittee would have to find replacement forage for the 527 AUMs/year lost equaling approximately $7,483.40/year (527 AUMs x $14.20/AUM). This additional expense to the permittee could affect quality of life.

The effects to recreational opportunities would be the same as the Proposed Action.

(6) Alternative V: Shorten the Season of Use

Effects would be the same as the Proposed Action.

(7) Alternative VI: Removal of Livestock

No revenue to the government would be generated under this alternative. The permittee would have to find replacement forage for the 2,107 AUMs/year lost equaling approximately $29,919.40 /year (2,107 AUMs x $14.20/AUM). This additional expense to the permittee could affect quality of life.

Improved rangeland conditions would enhance recreational opportunities such as hunting and wildlife viewing.

B. Discussion on Cumulative Effects Analysis

This chapter describes cumulative effects on resources from enacting the proposed alternative.

As the Council on Environmental Quality (CEQ), in guidance issued on June 24, 2005, points out, 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 on past actions may be useful in two ways according to the CEQ guidance. One is for consideration of the Proposed Action's cumulative effects, and secondly as a basis for identifying the Proposed Action's effects.

The CEQ stated in this guidance 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 inherently includes the effects of past actions. The CEQ guidance specifies that the "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." Our 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.

However, "experience with and information about past direct and indirect effects of individual past actions" have been found useful in "illuminating or predicting the direct and indirect effects" of the Proposed Action in the following instances: the basis for predicting the effects of the Proposed Action and its alternatives is based on the general accumulated experience of the resource professionals in the agency with similar actions.

The environmental consequences discussion described all expected effects, including direct, indirect, and cumulative, on resources from enacting the proposed alternatives. Direct and indirect effects plus past actions become part of the cumulative effects analysis; therefore, use of these words may not appear. In addition, the Introduction Section of this EA, specifically the Purpose of and Need for Action, identifies past actions creating the current situation.

RFFAs, also relevant to cumulative effects, include those Federal and non-Federal activities not yet undertaken, but sufficiently likely to occur, that a Responsible Official of ordinary prudence would take such activities into account in reaching a decision. These Federal and non-Federal activities that must be taken into account in the analysis of cumulative impact include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by the bureau. These RFFAs must fall within the geographic scope and timeframe of the analysis being prepared. Livestock grazing management, wild horse management, weed treatments, recreation activities, proposed range improvements, Five Creeks Rangeland Restoration Project, and North Steens Ecosystem Restoration Project ROD 2007 for both treated and untreated acres are known RFFAs. The cumulative effects of these six actions were thoroughly addressed throughout Chapter III by resource as applicable.

CHAPTER IV. CONSULTATION AND COORDINATION

A. List of Preparers

Jason Brewer - Wildlife Biologist *(Wildlife, Migratory Birds, and Special Status Species – Fauna: Terrestrial)*
Lindsay Davies - Fisheries/Riparian Specialist, (*Fisheries, Water Quality, Wetlands/Riparian Zones, Special Status Species – Fauna: Aquatic)*
Bill Dragt - Supervisory Natural Resource Specialist
Stacy Fenton - GIS Specialist
Eric Haakenson - Outdoor Recreation Planner (*Wilderness and Wilderness Study Areas*)
Rhonda Karges - District Planning and Environmental Coordinator (*Social and Economic Values*)
Mike Kelly - Natural Resource Specialist *(Recreation and Visual Resources)*
Gary McFadden - Wild Horse and Burro Program Manager
Caryn Meinicke - Botanist *(Special Status Species – Flora, Soils/Biological Crusts)*
Travis Miller - Rangeland Management Specialist – Lead Preparer *(Upland Vegetation, Livestock Grazing Management, and Kiger Mustang Area of Critical Environmental Concern and Herd Management Area*)
Lesley Richman - District Weed Coordinator (*Noxious Weeds and Invasive Nonnative Plant Species)*
Richard Roy - Three Rivers Resource Area Field Manager
Rob Sharp - District Range Lead
Scott Thomas - District Archaeologist *(American Indian Traditional Practices and Cultural Heritage)*

B. Agencies and Individuals Consulted

Burns Paiute Tribe
Kiger Mestano Association
Oregon Department of Fish and Wildlife
Oregon Natural Desert Association
Permittee

C. References

Allen, G.T. and P. Ramirez. 1990. A review of bird deaths on barbed-wire fences. Wilson Ornithological Society. 102(3):553-558.

Austin, D.D. and P.J. Urness. 1983. Overwinter forage selection by mule deer on seeded big sagebrush-grass range. Journal of Wildlife Management. 47(4):1203-1207.

Bailey, D.W. 2004. *Management strategies for optimal grazing distribution and use of arid rangelands.* J. Animal Science. 82(E. Suppl.):E147-E153.

Beever, E.A., R.J. Tausch and W.E. Thogmartin. 2007. Multi-scale responses of vegetation to removal of horse grazing from Great Basin (USA) mountain ranges. Plant Ecol DOI 10.1007/s11258-007-9342-5

Bentz, B., D. Alston, and T. Evans. 2008. Great Basin Insect Outbreaks. USDA Forest Service Gen. Tech. Rep. RMRS-GTR-204.

Blauer, A.C., E.D. McArthur, R. Stevens, and S.D. Nelson. 1993. Evaluation of roadside stabilization and beautification plantings in south-central UT. Research Paper INT-462, U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.

Bradly, B.A., R.A. Houghton, J.F. Mustard and S.P. Hamburg. 2006. Invasive grass reduces aboveground carbon stocks in shrublands of the Western US. Global Change Biology 12:1815-1822.

Clark, L., J. Hall, R. McLean, M. Dunbar, K. Klenk, R. Bowen, and C.A. Smeraski. 2006. Susceptibility of greater sage-grouse to experimental infection with West Nile virus. Journal of Wildlife Diseases. 42(1):14-22.

Clements, C.D., K.J. Gray and J.A. Young. 1997. Forage Kochia: To Seed or Not To Seed. Rangelands 19(4).

Connelly, J.W., S.T. Knick, M.A. Schroeder, and S.J. Stiver. 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming.

Crane, K.K., M. Smith, D. Reynolds. 1997. Habitat selection patterns of wild horses in south-central Wyoming. J. Range Manage. 50:374-380

Davies, K.W. 2008. Medusahead Dispersal and Establishment in Sagebrush Steppe Plant Communities. Rangeland Ecol Manage. 61:110-115.

Davies, K.W. and T.J. Svejcar. 2008. Comparison of Medusahead-Invaded and Non-invaded Wyoming Big Sagebrush Steppe in Southeastern Oregon. Rangeland Ecol Manage 61:623-629.

Davies, K.W., T.J. Svejcar, and J.D. Bates. 2009. Interaction of historical and nonhistorical disturbances maintains native plant communities. Ecological Applications 19(6), pp. 1536-1545.

Davies, K.W., A.M. Nafus, and R.L. Sheley. 2010. Non-native competitive perennial grass impedes the spread of an invasive annual grass. Biol Invasions 12:3187–3194.

Davies, K.W. 2010. Revegetation of Medusahead-Invaded Sagebrush Steppe. Rangeland Ecol Manage 63:564–571.

Davies, K.W., R.L. Sheley. 2011. Promoting Native Vegetation and Diversity in Exotic Annual Grass Infestations. Restoration Ecology Vol. 19, No. 2, pp. 159-165.

DeBess, E. 2009. State of Oregon West Nile virus summary report 2008. Oregon Department of Human Services. Portland, OR.

Dobkin, D., A.C. Rich, and W.H. Pyle. 1998. Habitat and avifaunal recovery from livestock grazing in a riparian meadow system of the Northwestern Great Basin. Conservation Biology. 12(1):209-221.

Drut, M.S. W.H. Pyle, and J.A. Crawford. 1994. Technical note: diets and food selection of sage grouse chicks in Oregon. Journal of Range Management. 47:90-93.

Dubay, S., H. Schwantje, J. deVos, and T. McKinney. 2002. Bighorn sheep (*Ovis canadensis)* diseases: a brief literature review and risk assessment for translocation. *In*: Proceedings of the Thirteenth Biennial Symposium of the Northern Wild Sheep and Goat Council: 134-152.

Frank, G.H., M.W. Miller, A.C. Ward. 2004. A review of *Pasteurella* pneumonia in domestic and wild sheep. *In*: Wyoming State-wide Bighorn/Domestic Sheep Interaction Working Group. Appendix J, 37 p.

Greenhalgh, L.K., B.L. Waldron, D.R. Zobell, K.C. Olson. 2009. Perennial Forage Kochia for Increased Production of Winter Grazed Pastures. Joint Abstracts of the American Dairy Science and Society of Animal Science.

Gregg, M.A. and J.A. Crawford. 2009. Survival of greater sage-grouse chicks and broods in the Northern Great Basin. Journal of Wildlife Management. 73(6):904-913.

Guthery, F.S. and R.L. Bingham. 1996. A theoretical basis for study and management of trampling by cattle. Journal of Range Management. 49(3):264-269.

Hagen, C.A. 2005. Greater sage-grouse conservation strategy assessment and strategy for Oregon: a plan to maintain and enhance populations and habitat. Oregon Department of Fish and Wildlife, Salem, USA.

Harrington, P. M., and M. R. Conover. 2006. Characteristics of ungulate behavior and mortality associated with wire fences. Wildlife Society Bulletin 34:1295-1305.

Harrison, R.D., N.J. Chatterton, B.L. Waldron, B.W. Davenport, A.J. Palazzo, W.H. Horton, and K.H. Asay. 2000. Forage Kochia - Its compatibility and potential aggressiveness on Intermountain rangelands. Utah Ag. Exp. Sta. Res. Rpt. 162. Utah State Univ., Logan, UT 84322-4820. pp. 66. (Available on-line at http://ars.usda.gov/Main/docs.htm?docid=3826 under Products & Services>Research Reports).

Hull, A.C. 1974. *Species for seeding arid rangeland in southern Idaho*. Journal of Range Manage. 27:216-218

Hull, A.C., Jr., Stewart, G. 1948. *Replacing cheatgrass by reseeding with perennial grass on southern Idaho ranges.* American Society of Agronomy Journal. 40:694-703

Kauffman, J.B. and W.C. Krueger. 1984. Livestock Impacts on Riparian Ecosystems and Streamside Management Implications. A Review. Journal of Range Management. 37(5):430-438.

Klus, R. Oregon Department of Fish and Wildlife Biologist. Personal communication.

Laycock, W.A. 1994. Implications of Grazing vs. No Grazing on Today's Rangelands. p. 250-280. In: Vavra, M., W.A. Laycock, and R.D. Pieper (eds.). Ecological Implications of Livestock Herbivory in the West. Society for Range Management, Denver, CO.

Mangla, S., R.L. Sheley and J.J. James. Field growth comparisons of invasive alien annual and native perennial grasses in monocultures. Journal of Arid Environments, In Press, Corrected Proof. Available online 28 October 2010.

McAdoo, J.K., W.S. Longland, and R.A. Evans. Nongame bird community responses to sagebrush invasion of crested wheatgrass seedings. Journal of Wildlife Management. 53(2):494-502.

Miller, R.F., Bates, J.D., Svejcar, T.J., Pierson, F.B., and Eddleman, L.E. 2005. **Biology, Ecology, and Management of Western Juniper**. Technical Bulletin 152. Oregon State University, Agricultural Experiment Station. Corvallis, OR.

Miller, R.F., T.J. Svejcar, and N.E. West. 1994. Implications of Livestock Grazing in the Intermountain Sagebrush Region: Plant Composition. p. 101-146. In: Vavra, M., W.A. Laycock, and R.D. Pieper (eds.). Ecological Implications of Livestock Herbivory in the West. Society for Range Management, Denver, CO.

Miller, Richard F., R.J. Tausch, D.E. McArthur, D.D. Johnson, and S.C. Sanderson. 2008. **Age structure and expansion of piñon-juniper woodlands: a regional perspective in the Intermountain West.** Res. Pap. RMRS-RP-69. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 15 p.

Monaco, T.A., B.L. Waldron, R.L. Newhall and W.H. Horton. 2003. Re-establishing Perennial Vegetation in Cheatgrass Monocultures. Rangelands 25(2):26-29.

Naugle, D.E., C.L. Aldridge, B.L. Walker, T.E. Cornish, B.J. Moynahan, M.J. Holloran, K. Brown, G.D. Johnson, E.T. Schmidtmann, R.T. Mayer, C.Y. Kato, M.R. Matchett, T.J. Christiansen, W.E. Cook, T. Creekmore, R.D. Falise, E.T. Rinkes, and M.S. Boyce. 2004. West Nile virus: pending crisis for greater sage-grouse. Ecology Letters 7:704-713.

Nimmo, D.G., K. Miller. 2007. Ecological and human dimensions of management of wild horses in Australia: a review. Wildlife Research. 34: 408-417.

Onderka, D.K. and W.D. Wishart. 1988. Experimental contact transmission of *Pasteurella haemolytica* from clinically normal domestic sheep causing pneumonia in Rocky Mountain bighorn sheep. Journal of Wildlife Diseases 24(4):663-667.

Pampush, G.J., and R.G. Anthony. 1993. Nest success, habitat utilization and nest-site selection of Long-billed Curlews in the Columbia Basin, Oregon. Condor 95:957-967.

Pierson, B.P., J.D. Bates, T.J. Svejcar, S.P Hardegree. 2007. Runoff and Erosion After Cutting Western Juniper. *Rangeland Ecology Management* 60: 285-292.

Pyke, D.A., 1999, Monitoring weed populations in biocontrol projects[abs.]: Weed biocontrol: Extended abstracts from the 1997 Interagency Noxious-Weed Symposium, December 2-4, 1997, Corvallis, OR., p. 39-42. Catalog No: 681

Pyke, D.A. 2000. Invasive exotic plants in sagebrush ecosystems of the Intermountain West. Pages 43-54 *in* P.G. Entwistle, A.M. Debolt, J.H. Kaltenecker, K. Steenhof (compilers). Proc. Sagebrush Steppe Ecosystems Symposium; June 21-23, 1999; Boise State University, Boise, ID. Publ. no. BLM/ID/PT-0001001+1150. Bureau of Land Management. Boise, ID: 43.

Rau, B.M., J.C. Chambers, R.R. Blank, and D.W. Johnson. 2008. Prescribed Fire, Soil, and Plants: Burns Effects and Interactions in the Central Great Basin. *Rangeland Ecology Management* 61: 169-181.

Rau, B.M., D.W. Johnson, R.R. Blank, and J.C. Chambers. 2009. Soil carbon and nitrogen in a Great Basin pinyon-juniper woodland: Influence of vegetation, burning, and time. *Journal of Arid Environments* 73: 472-479.

Reynolds, T.D. 1981. Nesting of the sage thrasher, sage sparrow, and Brewer's sparrow in southeastern Idaho. The Condor. 83(1):61-64.

Schommer, T.J. and M.M. Woolever. 2008. A review of disease related conflicts between domestic sheep and goats and bighorn sheep. Gen. Tech. Rep. RMRS-GTR-209 Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 16 p.

Stevens, R., K.R. Jorgensen, E.D. McArthur, and J.N. Davis. 1985. 'Immigrant' Forage Kochia. *Rangelands* 7(1).

Thomas, J.W., C. Maser, and J.E. Rodiek. 1979. Wildlife habitats in managed rangelands—the Great Basin of southeastern Oregon: riparian zones. *Gen. Tech. Rep. PNW-GTR-080*. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Vavra, M. and F. Sneva. 1978. Seasonal diets of five ungulates grazing the cold desert biome. Eastern Oregon Agricultural Research Center. Unpublished report. 17 pp.

Wall, T.G., R.F. Miller, and T.J. Svejcar. 2001. Juniper encroachment into aspen in the Northwest Great Basin. *Journal of Range Management* 54: 691-698.

Young, J.A. 1992. Ecology and Management of Medusahead. *Great Basin Naturalist* 52(3). PP. 245-252.

1991. BLM. *Three Rivers Proposed Resource Management Plan and Final Environmental Impact Statement.* Burns District BLM.

1992. BLM. *Three Rivers Resource Management Plan, Record of Decision, and Rangeland Program Summary Environmental Impact Statement.* Burns District BLM.

1997. BLM. *Grazing Management for Riparian-Wetland Areas*. Technical Reference 1737-14, National Applied Science Center, Denver, CO.

2005. BLM. *Andrews Management Unit and Steens Mountain Cooperative Management and Protection Area Resource Management Plans Appendices (A-O) and Maps*. Burns District BLM.

2006. NRCS. *Soil Survey of Harney County Area, Oregon*. USDA.

2007. BLM. *Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement.* U.S. DOI, BLM.

2007. BLM. *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Record of Decision September 2007.* U.S. DOI, BLM.

2008. USFWS. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp.

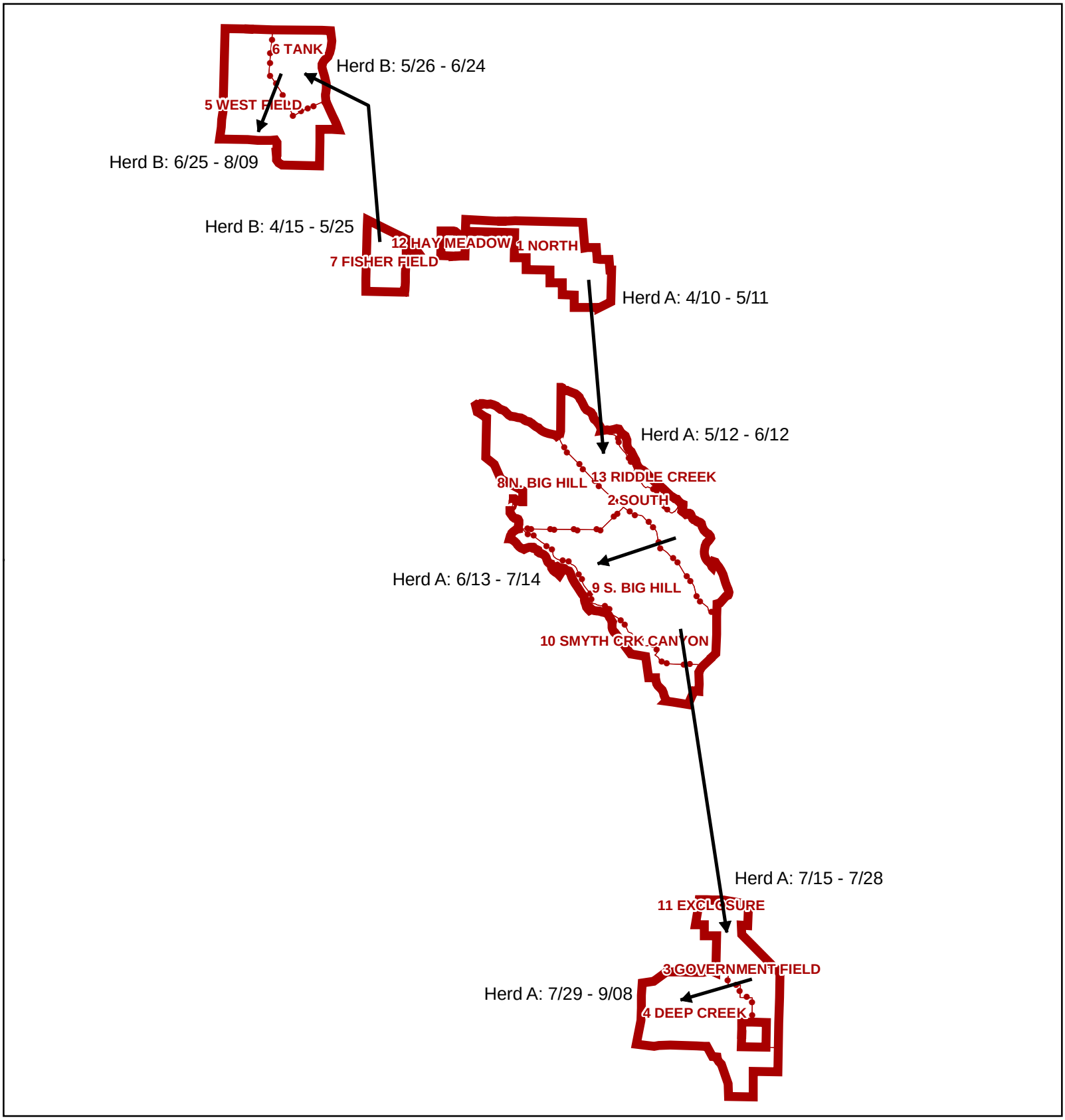
2010. BLM. *Final Vegetation Treatments Using Herbicides on BLM Lands in Oregon Environmental Impact Statement.* BLM, Oregon State Office.

2010. BLM. *Vegetation Treatments Using Herbicides on BLM Lands in Oregon Record of Decision October 2010.* BLM, Oregon State Office.

http://websoilsurvey.nrcs.usda.gov/

APPENDIX A

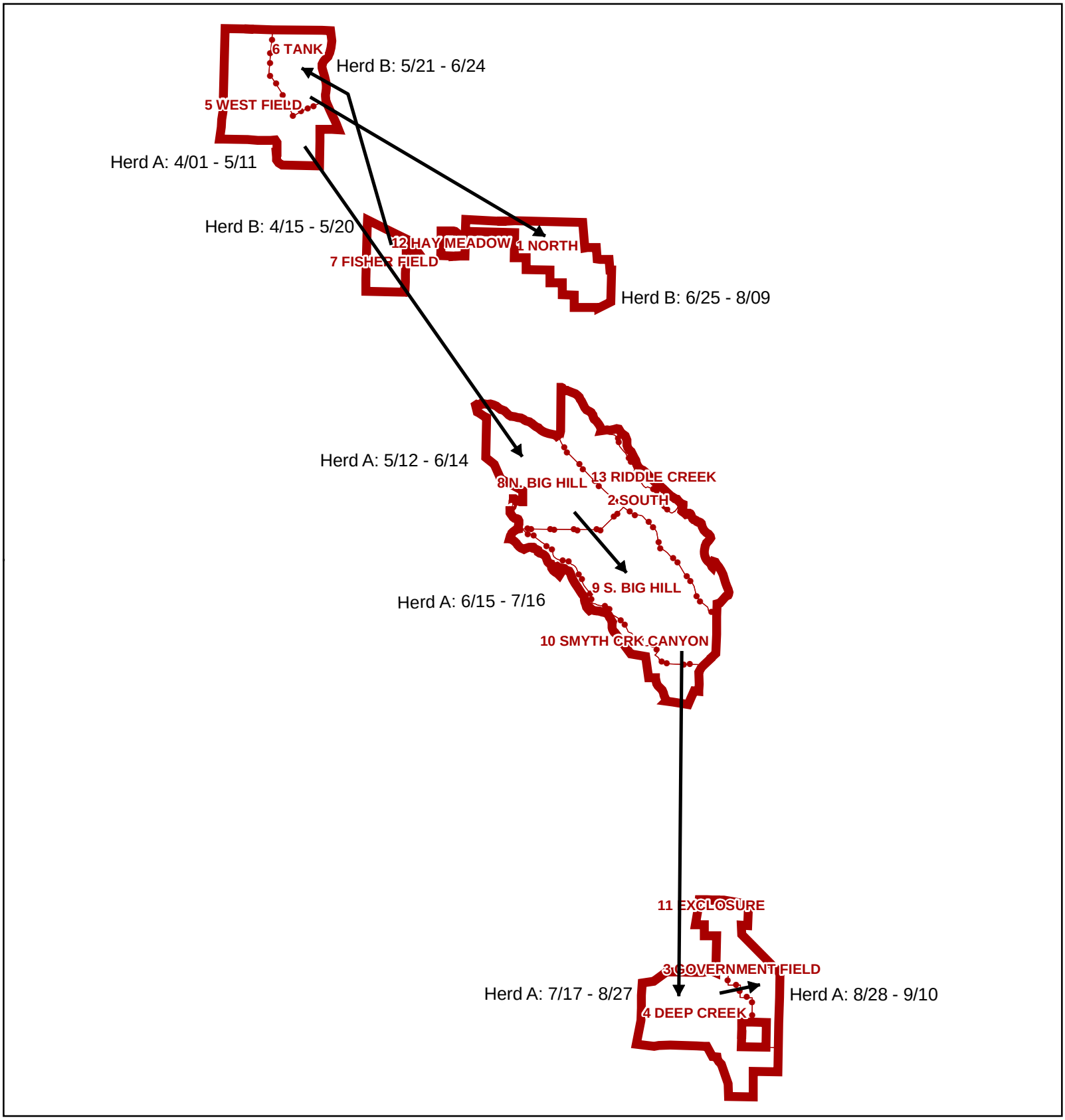
Happy Valley
Grazing Schematic - Year 1



Allotment Boundary

Pasture Boundary

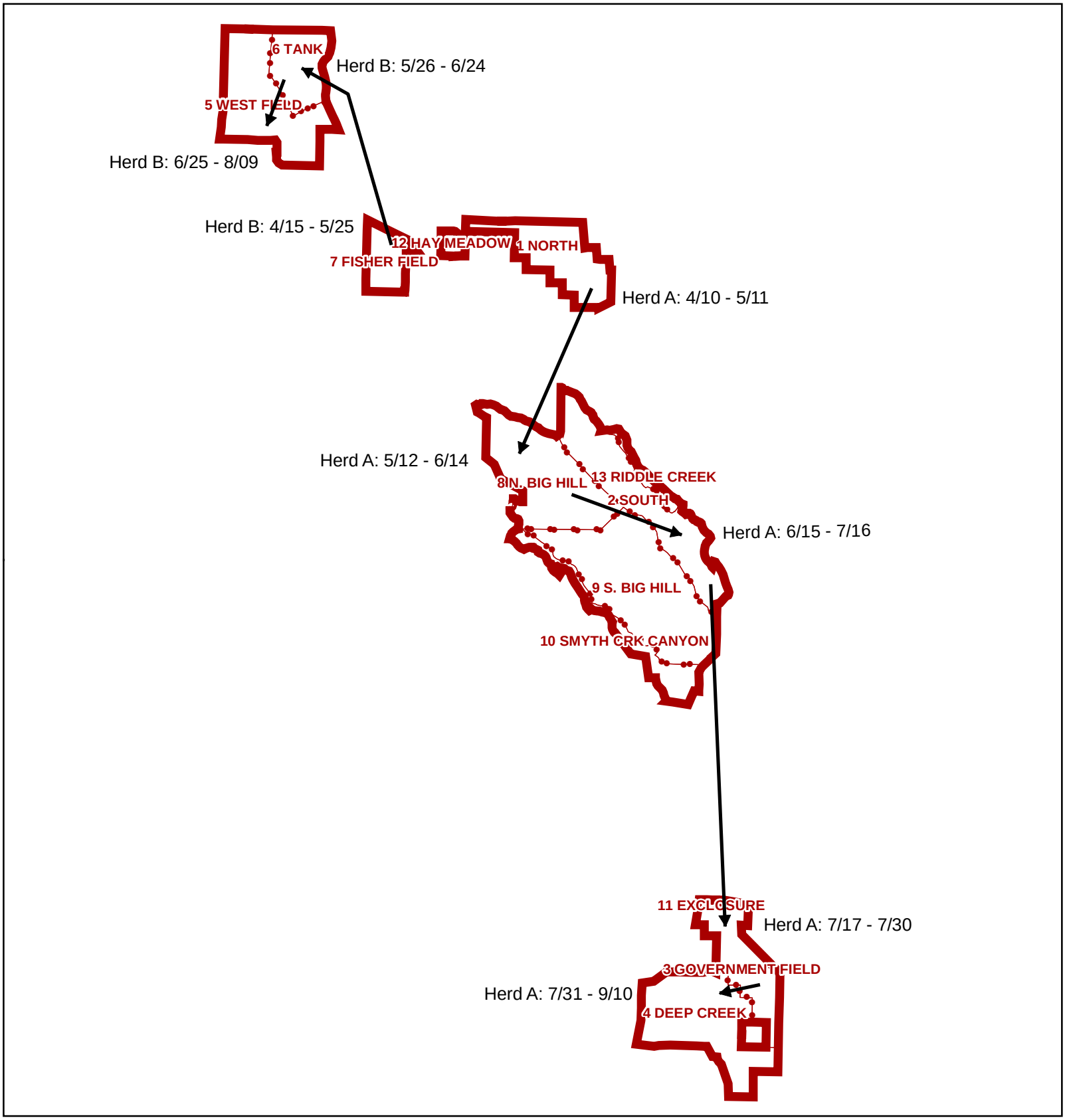
Happy Valley
Grazing Schematic - Year 2



Allotment Boundary

Pasture Boundary

Happy Valley
Grazing Schematic - Year 3

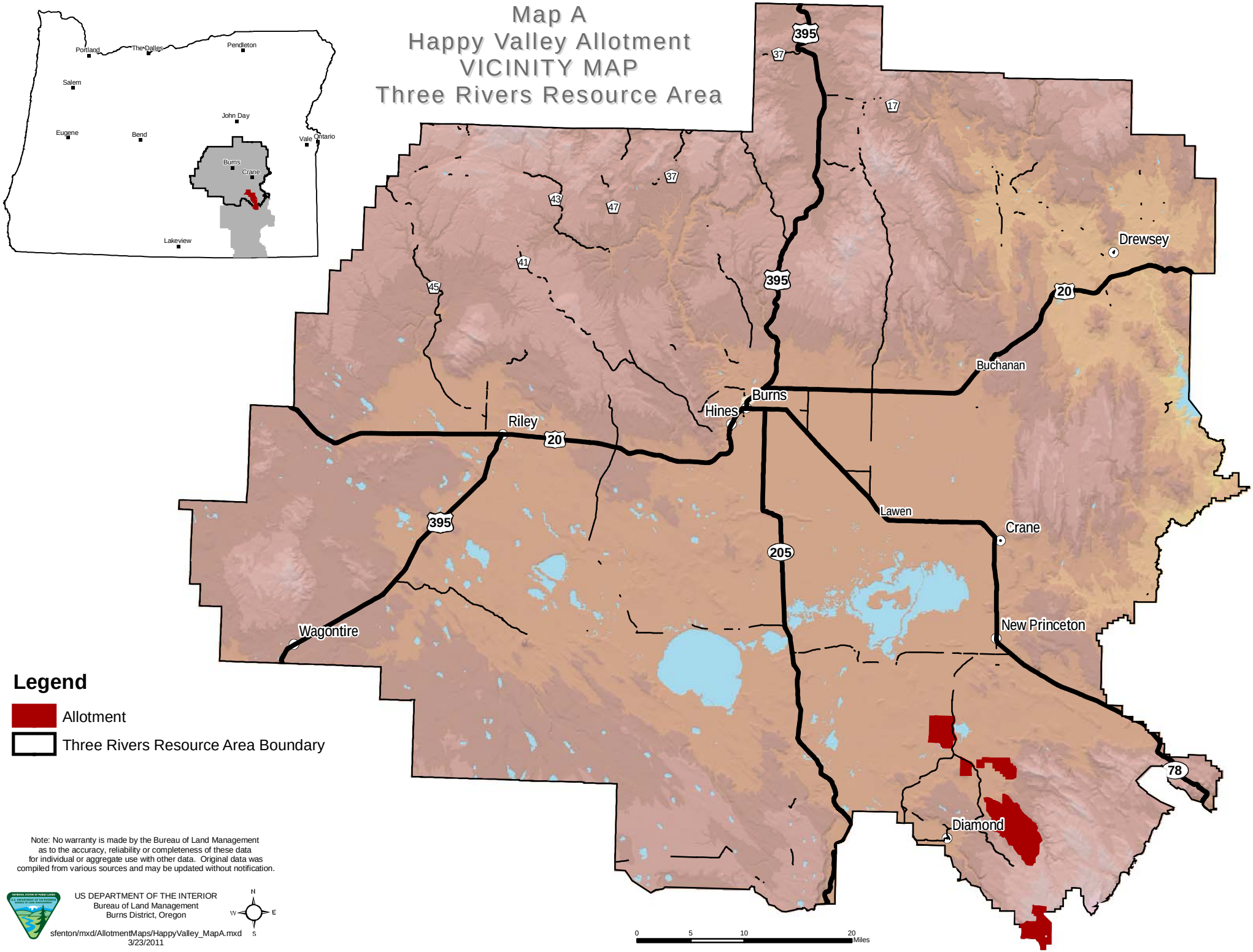


Allotment Boundary

Pasture Boundary

APPENDIX B

Map A
Happy Valley Allotment
VICINITY MAP
Three Rivers Resource Area



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Burns District, Oregon

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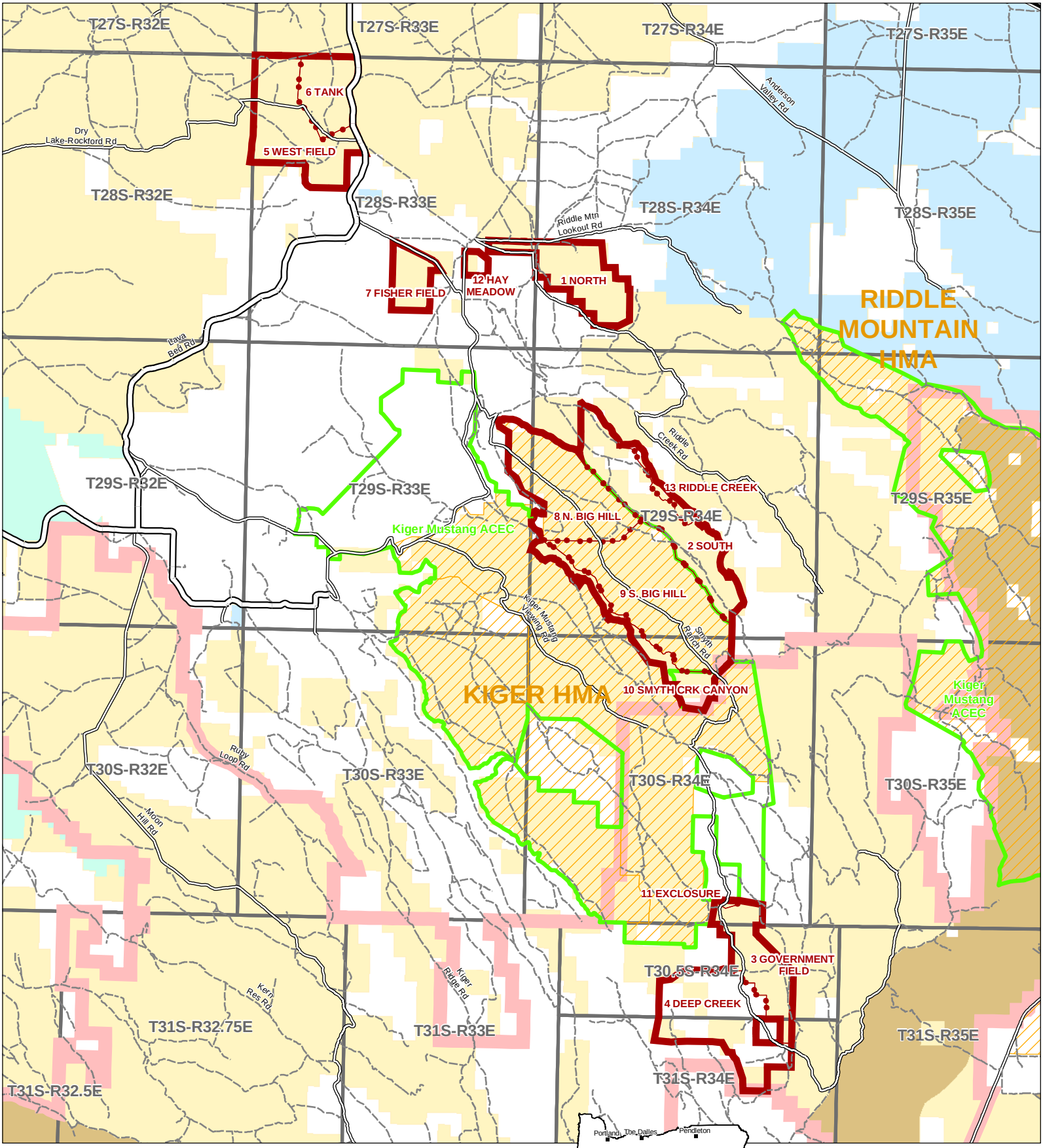
Map B

Happy Valley Allotment
LAND STATUS and SPECIAL MANAGEMENT AREAS



Area of Critical Environmental Concern (ACEC)

Herd Management Areas

Steens Mountain Cooperative Management and Protection Area

Allotment Boundary

Pasture Boundary

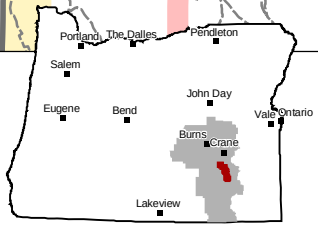
BLM Wilderness Study Area

Bureau of Land Management

U.S. Fish and Wildlife Service

State

Private/Unknown



3 Miles

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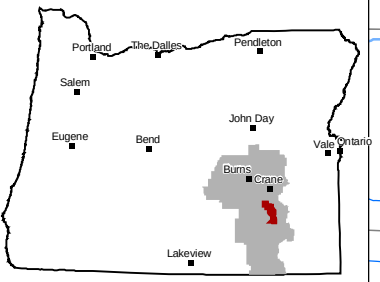
Map C
Happy Valley Allotment North End
CURRENT RANGE IMPROVEMENTS

- Trend Sites
- RESERVOIR
- SPRING
- TANK
- TROUGH
- WELL
- FENCE
- PIPELINE
- Pasture Boundary
- Allotment Boundary
- Perennial Streams
- Intermittent Streams
- Bureau of Land Management
- State
- Private/Unknown



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Burns District, Oregon

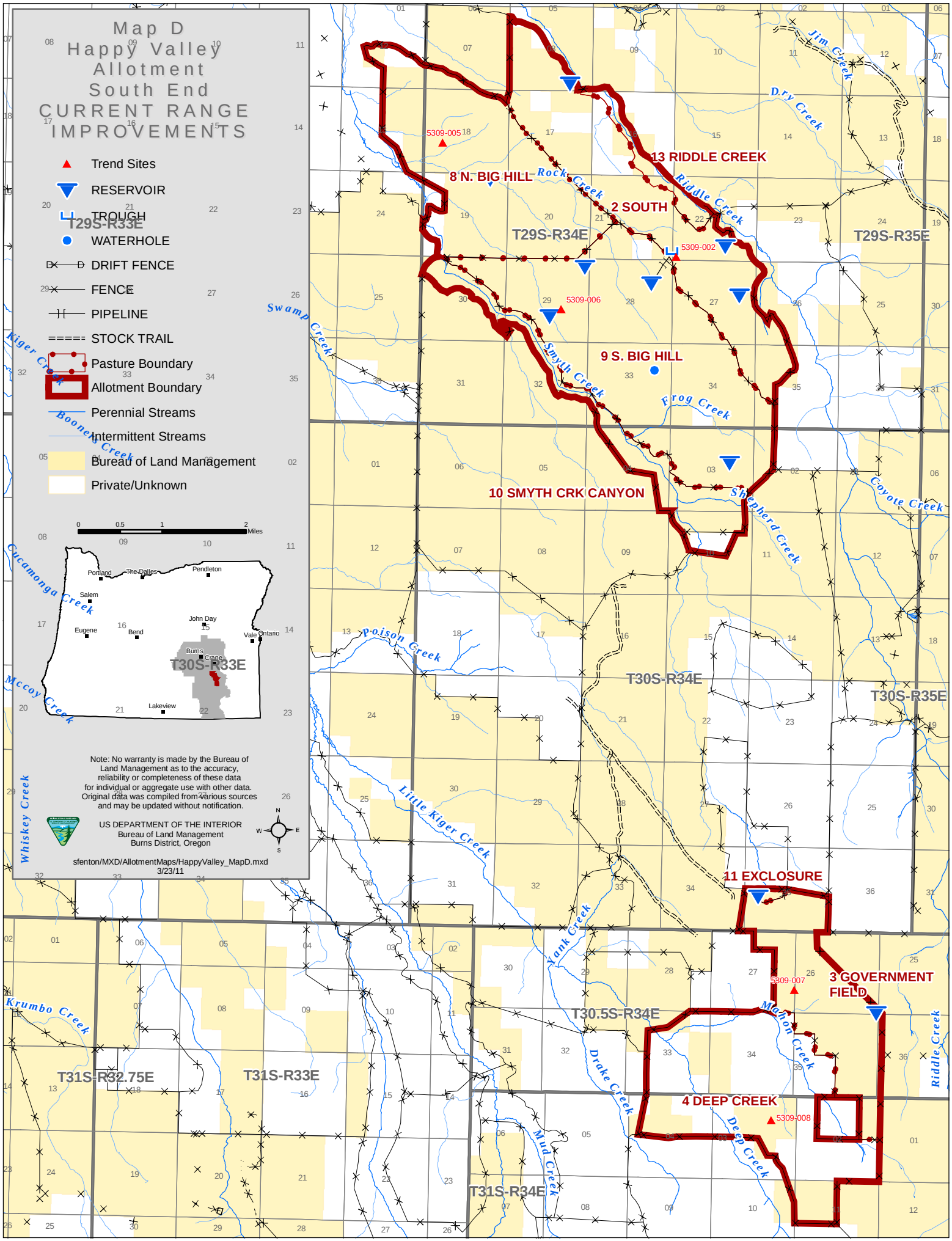
sfenton/MXD/AllotmentMaps/HappyValley_MapC.mxd
3/23/2011

0 0.5 1 2 Miles

T27S-R32E
T27S-R33E
T27S-R34E
T28S-R33E
T28S-R34E
T29S-R33E
T29S-R34E

6 TANK
5 WEST FIELD
7 FISHER FIELD
12 HAY MEADOW
1 NORTH

Riddle Creek
HIGHLINE DITCH
Smyth Creek
Paul Creek


Map D
Happy Valley
Allotment
South End
CURRENT RANGE
IMPROVEMENTS
Trend Sites
RESERVOIR
TROUGH
WATERHOLE
DRIFT FENCE
FENCE
PIPELINE
STOCK TRAIL
Pasture Boundary
Allotment Boundary
Perennial Streams
Intermittent Streams
Bureau of Land Management
Private/Unknown
0 0.5 1 2 Miles
Portland
The Dalles
Pendleton
Salem
Eugene
Bend
John Day
Vale
Ontario
Burns
Crane
Lakeview
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Bureau of Land Management
Burns District, Oregon
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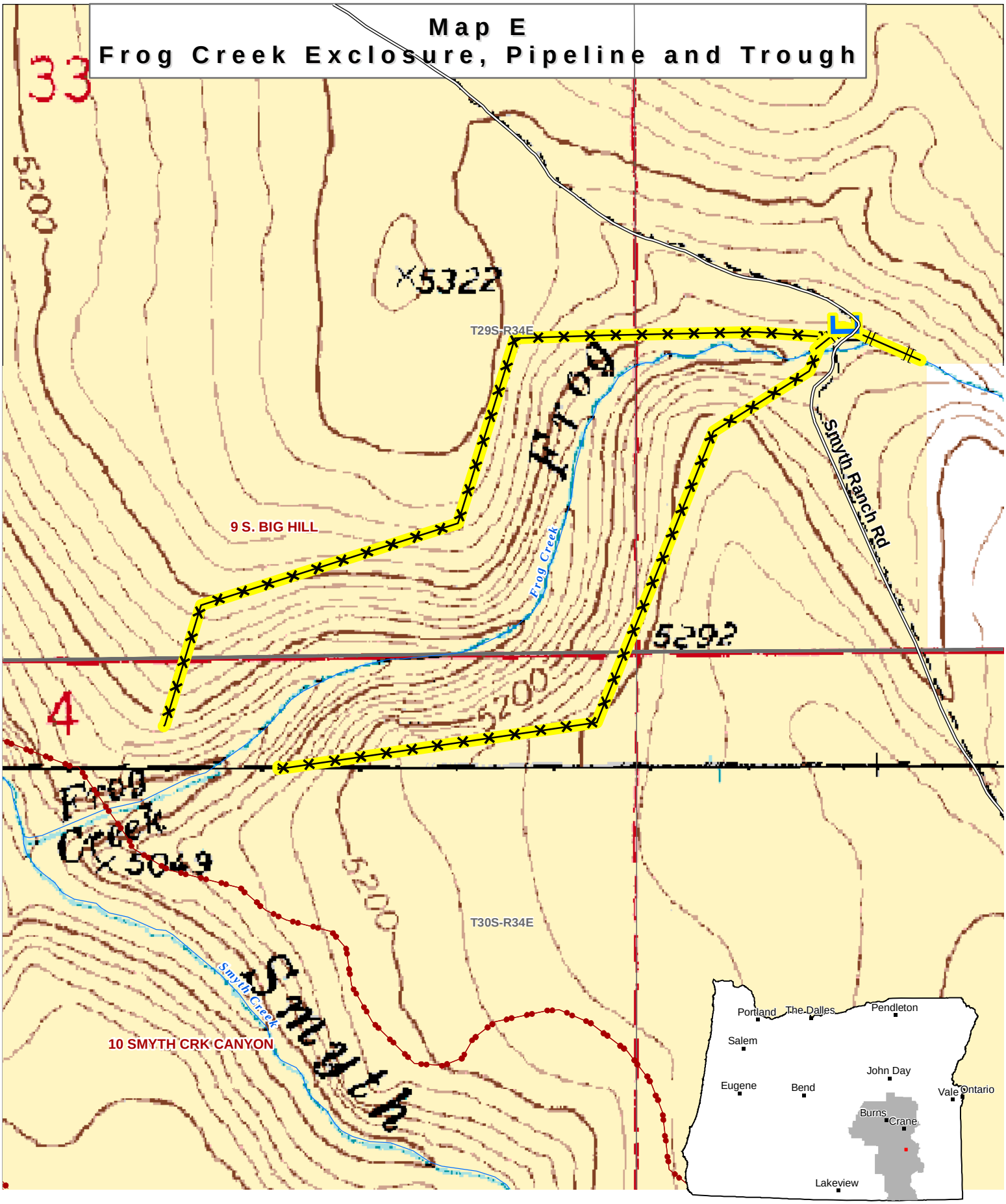
3/23/11
13 RIDDLE CREEK
8 N. BIG HILL
2 SOUTH
9 S. BIG HILL
10 SMYTH CRK CANYON
11 EXCLOSURE
3 GOVERNMENT FIELD
4 DEEP CREEK
5309-005
5309-002
5309-006
5309-007
5309-008
T29S-R33E
T29S-R34E
T29S-R35E
T30S-R33E
T30S-R34E
T30S-R35E
T30.5S-R34E
T31S-R32.75E
T31S-R33E
T31S-R34E
Jim Creek
Dry Creek
Rock Creek
Riddle Creek
Swamp Creek
Kiger Creek
Smyth Creek
Frog Creek
Boones Creek
Shepherd Creek
Coyote Creek
Cucamonga Creek
Poison Creek
Mccoy Creek
Little Kiger Creek
Whiskey Creek
Yank Creek
Krumbo Creek
Mahon Creek
Drake Creek
Mud Creek
Deep Creek
Riddle Creek

Map E
Frog Creek Exclosure, Pipeline and Trough



Legend

- Proposed Fence
- Proposed Pipeline
- Proposed Trough
- Pasture Boundary
- Non-Paved Improved Road
- Perennial Streams
- Intermittent Streams
- Bureau of Land Management
- Private/Unknown

0.25
Miles

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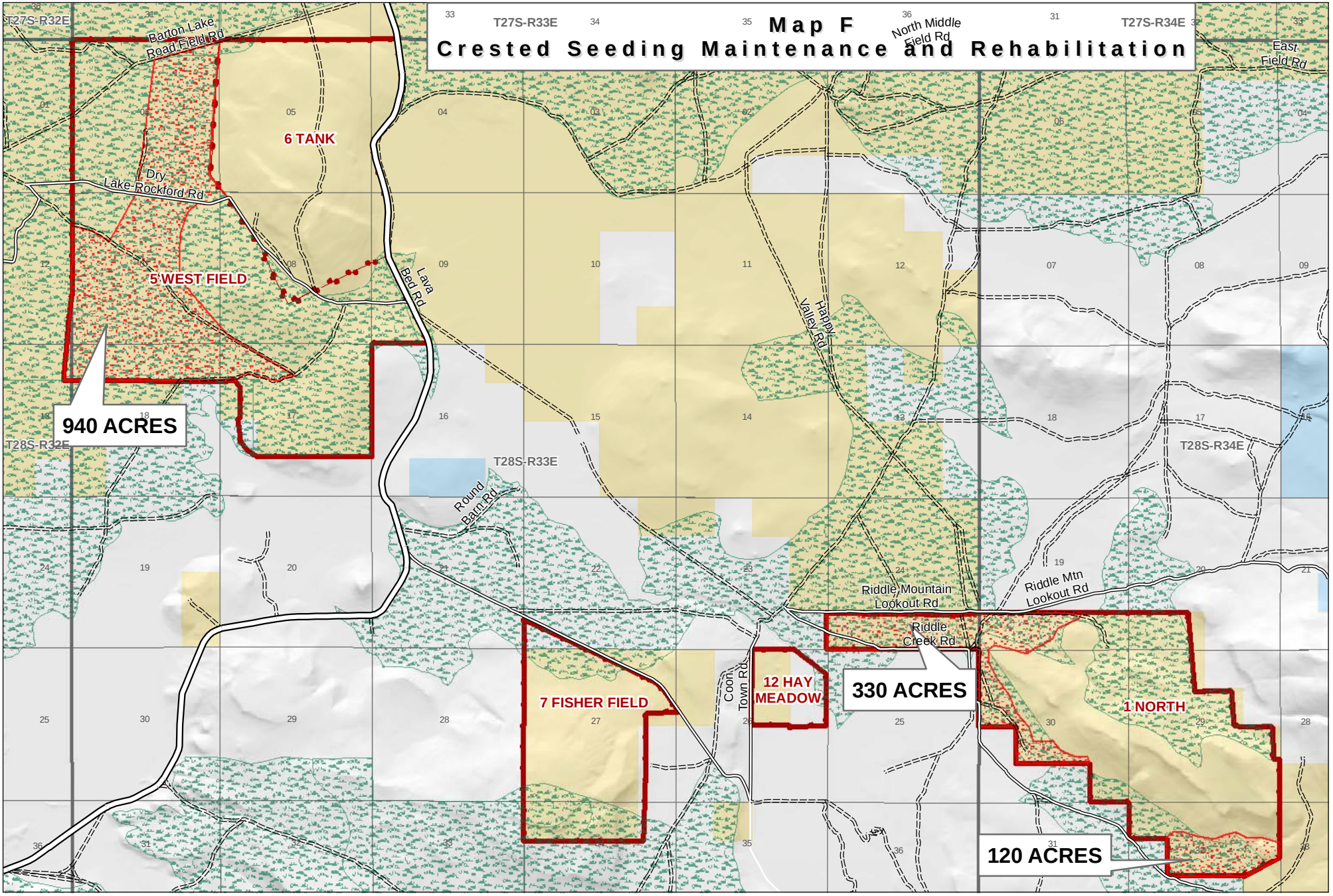
Map F
Crested Seeding Maintenance and Rehabilitation



Legend

- Previous Range Seeding
- Proposed Range Seeding
- Allotments
- Pasture Boundary
- Bureau of Land Management
- State
- Private/Unknown
- Paved Road
- Non-Paved Improved Road
- Natural/Unknown Road Surface

2 Miles

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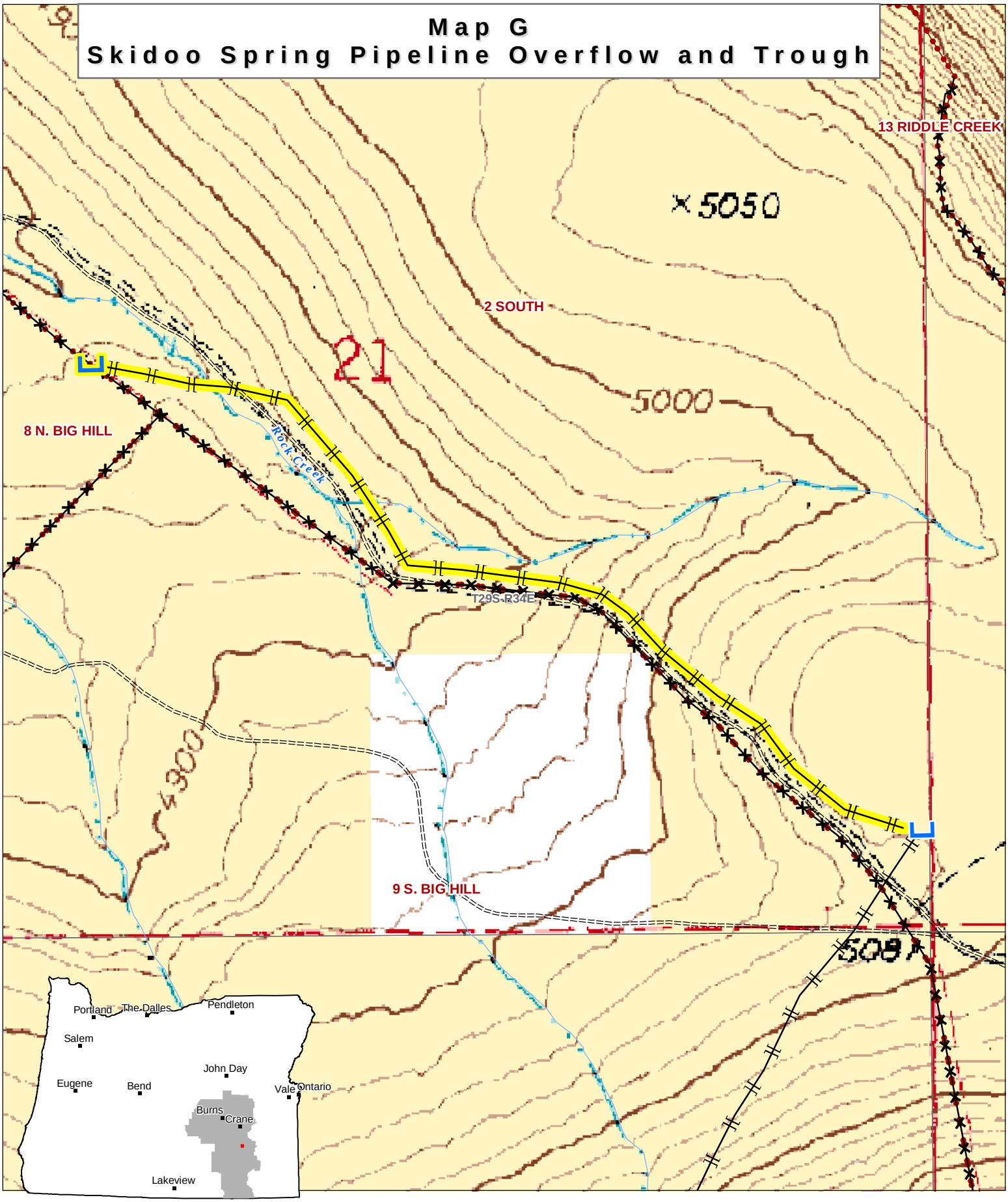
Map G
Skidoo Spring Pipeline Overflow and Trough



Proposed Trough
Proposed Fence
Proposed Pipeline
Existing Trough
Existing Fence
Existing Pipeline
Pasture Boundary
0.25
Miles
Perennial Streams
Intermittent Streams
Natural/Unknown Road Surface
Bureau of Land Management
Private/Unknown

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Burns District, Oregon

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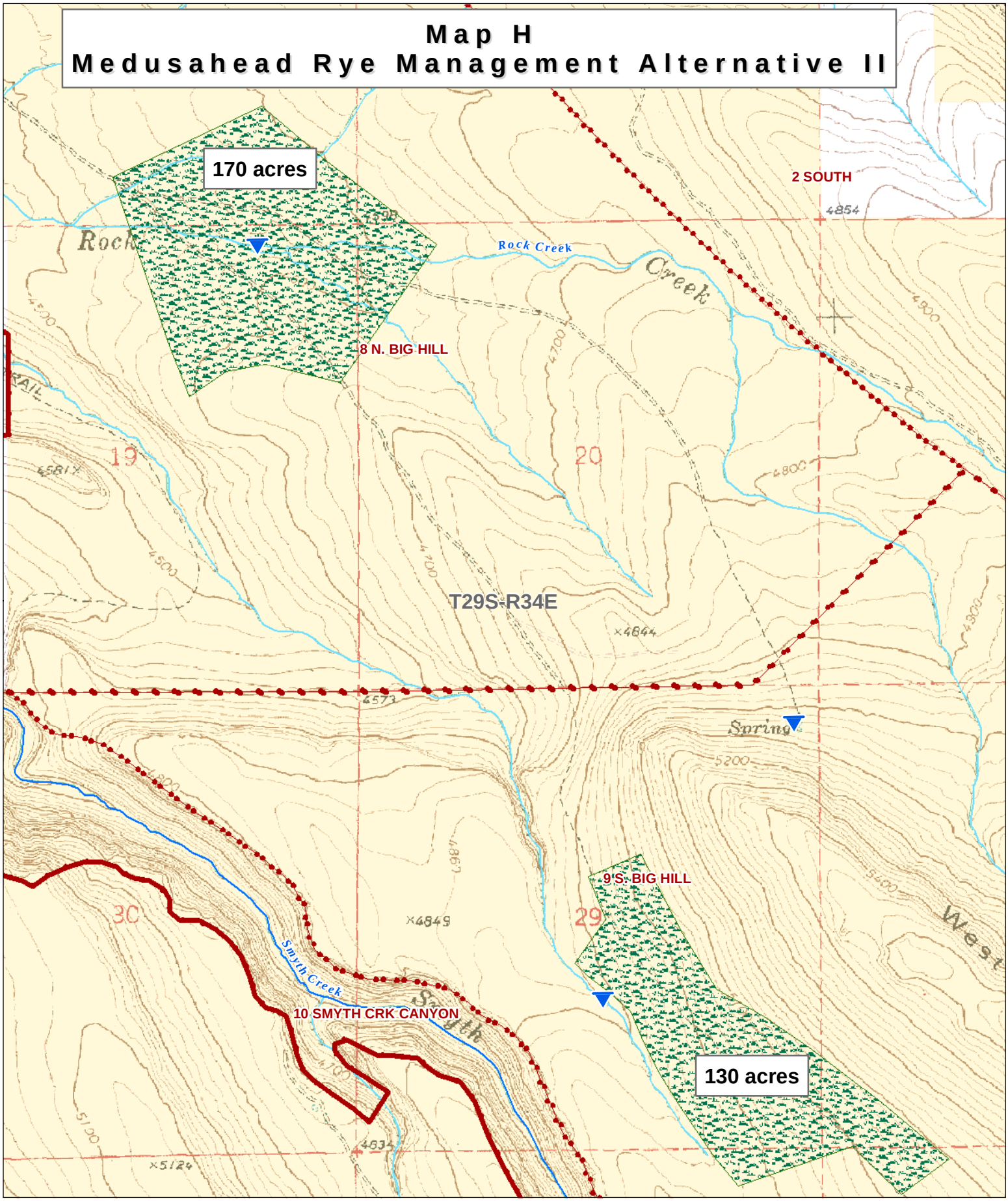
Map H
Medusahead Rye Management Alternative II



Legend

- Seeding
- Allotments
- Pasture Boundary
- Bureau of Land Management
- Private/Unknown
- Perennial Streams
- Intermittent Streams
- Reservoir

0.5
Miles

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Burns District, Oregon

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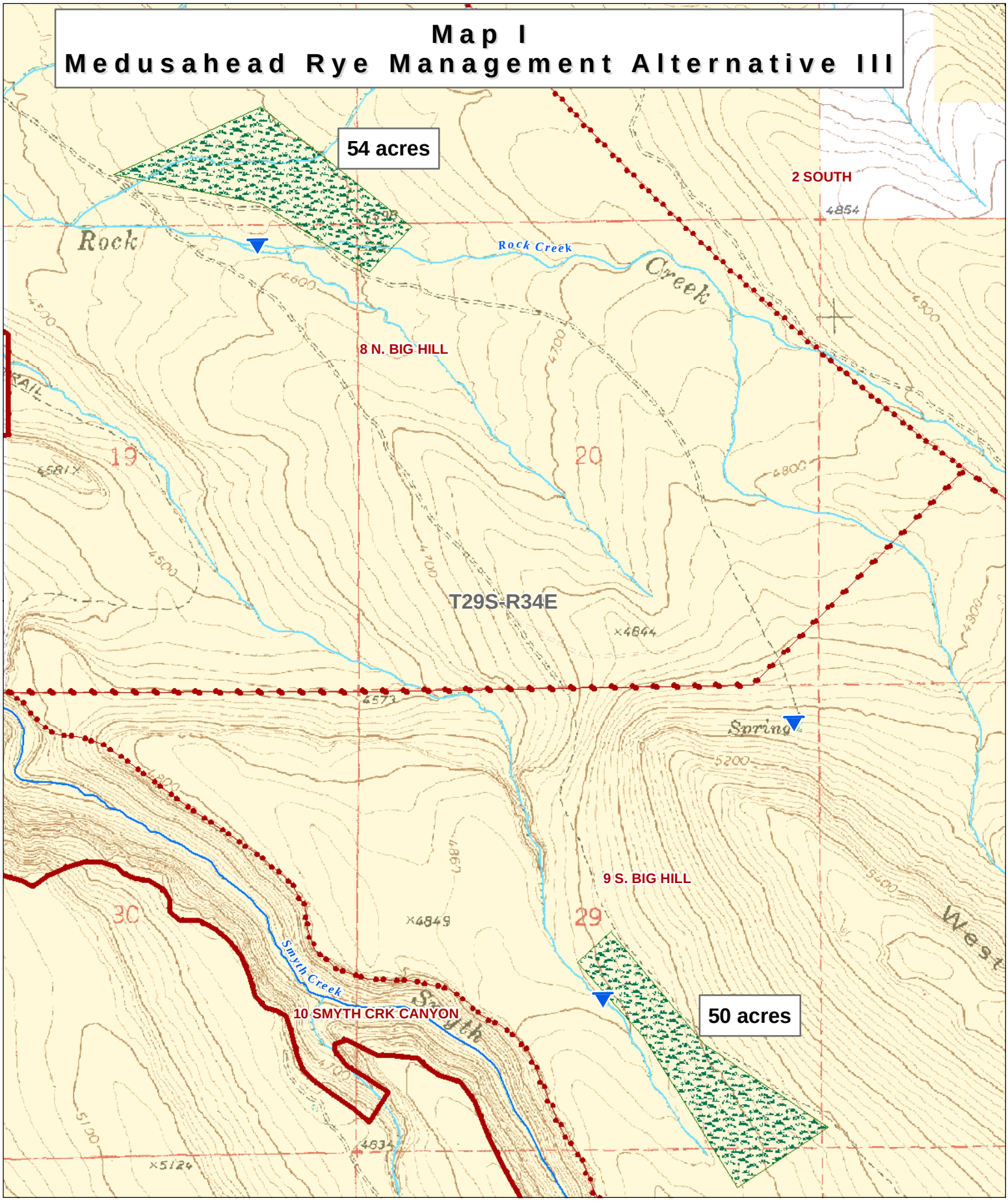
Map I
Medusahead Rye Management Alternative III



Legend

- Seeding
- Allotments
- Pasture Boundary
- Bureau of Land Management
- Private/Unknown
- Perennial Streams
- Intermittent Streams
- Reservoir

0.5
Miles

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Bureau of Land Management
Burns District, Oregon

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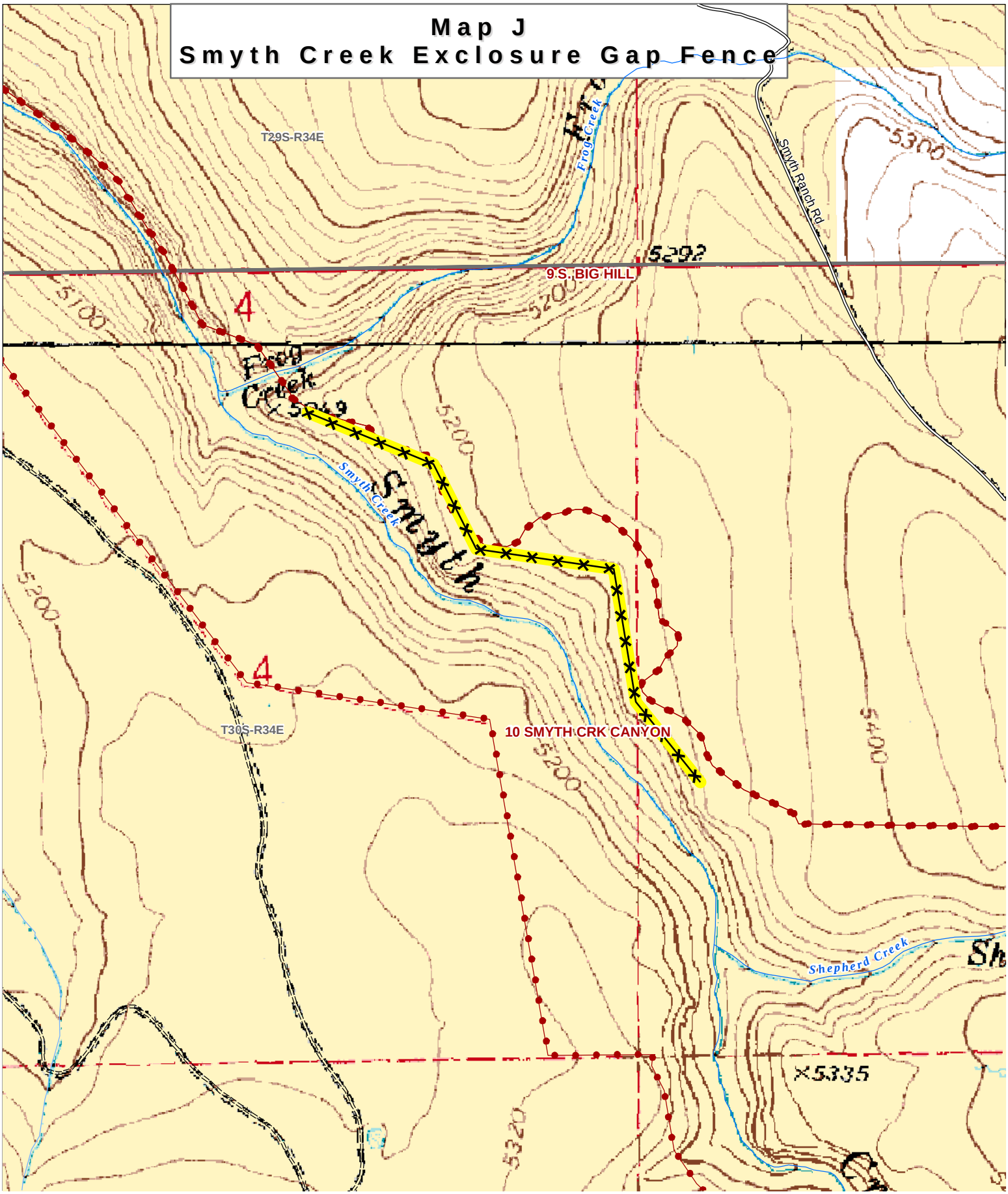
Map J
Smyth Creek Exclosure Gap Fence



Legend

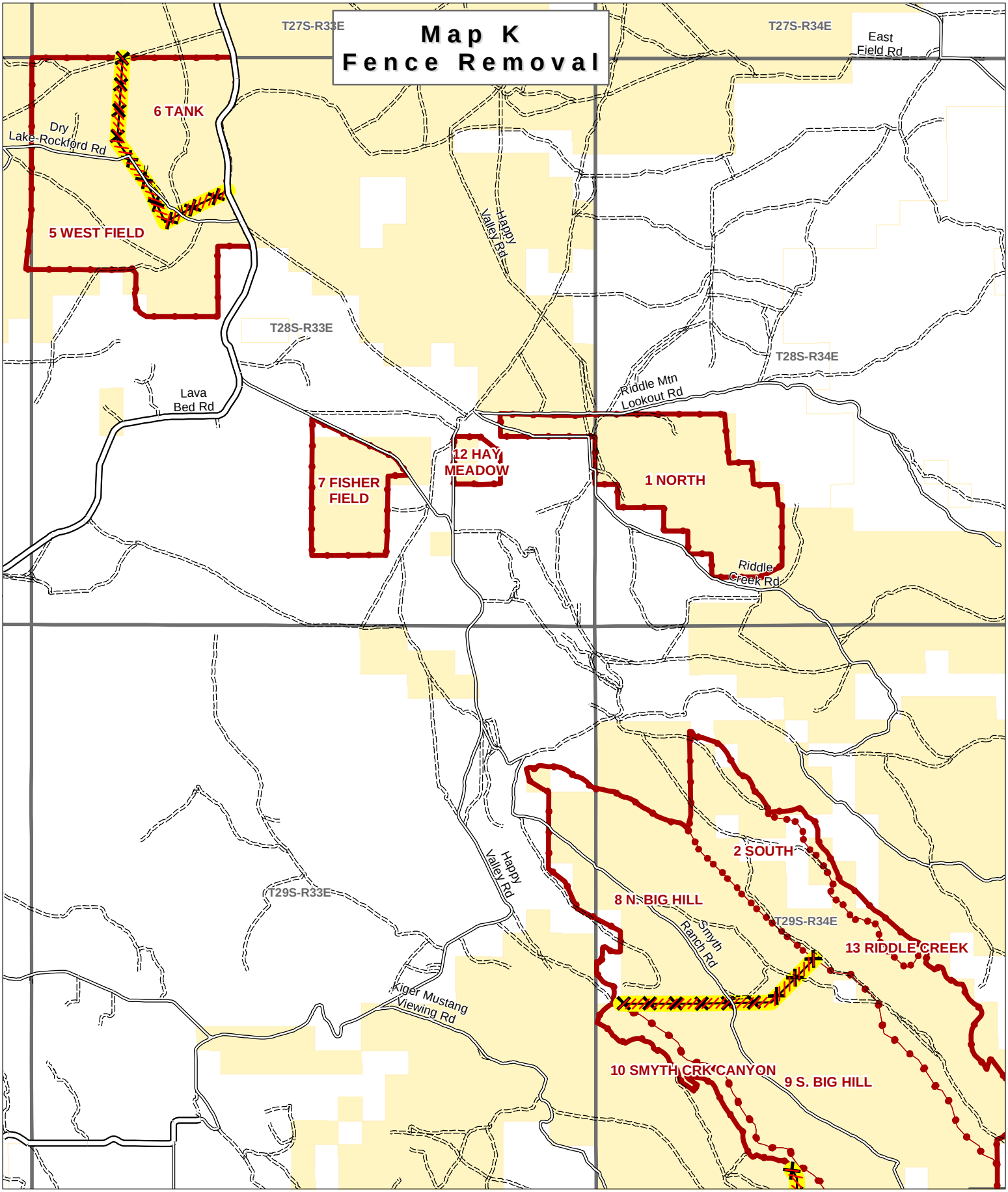
- Proposed Gap Fence
- Pasture Boundary
- Bureau of Land Management
- Private/Unknown
- Non-Paved Improved Road
- Natural/Unknown Road Surface
- Perennial Streams
- Intermittent Streams

0.25
Miles

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Burns District, Oregon

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual or aggregate use with other data. Original data was compiled from various sources and may be updated without notification.

sfenton/MXD/AllotmentMaps/HappyValley_MapJ.mxd
3/23/2011



Legend

- Remove Fence
- Pasture Boundary
- Bureau of Land Management
- Private/Unknown
- Paved Road
- Non-Paved Improved Road
- Natural/Unknown Road Surface

2
Miles

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Burns District, Oregon

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APPENDIX C

Standard Operating Procedures and Mitigation Measures

Excerpted from the Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS/ROD (2010) (pp. 457-467)

Introduction

The following Standard Operating Procedures and Mitigation Measures have been adopted from the Record of Decision for the PEIS. Minor edits have been made to some Standard Operating Procedures and Mitigation Measures to clarify intent.

Standard Operating Procedures (identified below with SOP) have been identified to reduce adverse effects to environmental and human resources from vegetation treatment activities based on guidance in BLM manuals and handbooks, regulations, and standard BLM and industry practices.[1] The list is not all encompassing, but is designed to give an overview of practices that would be considered when designing and implementing a vegetation treatment project on public lands (PER:2-29)[2]. Effects described in the EIS are predicated on application of the Standard Operating Procedures, that a site-specific determination is made that their application is unnecessary to achieve their intended purpose or protection, or that if the parent handbook or policy direction evolves, the new direction would continue to provide the appropriate environmental protections.

For example, the Standard Operating Procedure to "complete vegetation treatments seasonally before pollinator foraging plants bloom" would not be applied to treatments not likely to have a significant effect on pollinators.

PEIS Mitigation Measures (identified below with MM) were identified for all potential adverse effects identified in the PEIS. They are included in, and adopted by, the Record of Decision for the PEIS. Like the SOPs, application of the mitigation measures is assumed in this EIS. However, for PEIS Mitigation Measures, site-specific analysis and/or the use of Individual Risk Assessments Tools (see Chapter 3), or evolution of the PEIS Mitigation Measures into handbook direction at the national level, would be permitted to identify alternative ways to achieve the expected protections (PEIS:4-4).

Although not displayed here, Standard Operating Procedures for non-herbicide treatments (from regulation, BLM policy, and BLM Handbook direction) also apply (PER:2-31 to 44).

Standard Operating Procedures and Mitigation Measures for Applying Herbicides

Guidance Documents

BLM Handbook H-9011-1 (*Chemical Pest Control*); and manuals 1112 (*Safety*), 9011 (*Chemical Pest Control*), 9012 (*Expenditure of Rangeland Insect Pest Control Funds*), 9015 (*Integrated Weed Management)*, and 9220 (*Integrated Pest Management*).

1 Manual-directed standard operating procedures and other standing direction may be referred to as best management practices in resource management and other plans, particularly when they apply to water.

2 The PER includes Standard Operating Procedures for the full range of vegetation treatment methods. Only those applicable to herbicide application are included in this appendix.

General

- Prepare an operational and spill contingency plan in advance of treatment. *(SOP)*
- Conduct a pretreatment survey before applying herbicides. *(SOP)*
- Select the herbicide that is least damaging to the environment while providing the desired results. *(SOP)*
- Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, other ingredients, and tank mixtures. *(SOP)*
- Apply the least amount of herbicide needed to achieve the desired result. *(SOP)*
- Follow herbicide product label for use and storage. *(SOP)*
- Have licensed or certified applicators or State-licensed "trainees" apply herbicides, or they can be applied by BLM employees under the direct supervision of a BLM-certified applicator. *(SOP)*
- Use only USEPA-approved herbicides and follow product label directions and "advisory" statements. *(SOP)*
- Review, understand, and conform to the "Environmental Hazards" section on the herbicide product label. This section warns of known herbicide risks to the environment and provides practical ways to avoid harm to organisms or to the environment. *(SOP)*
- Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas. *(SOP)*
- Minimize the size of application area, when feasible. *(SOP)*
- Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents/ landowners. *(SOP)*
- Post treated areas and specify reentry or rest times, if appropriate. *(SOP)*
- Notify adjacent landowners prior to treatment, if appropriate. *(SOP)*
- Keep a copy of Material Safety Data Sheets (MSDSs) at work sites. MSDSs are available for review at http:// www.cdms.net/. *(SOP)*
- Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location. *(SOP)*
- Avoid accidental direct spray and spill conditions to minimize risks to resources. *(SOP)*
- Avoid aerial spraying during periods of adverse weather conditions (snow or rain imminent, fog, or air turbulence). *(SOP)*
- Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground. *(SOP)*
- Take precautions to minimize drift by not applying herbicides when winds exceed >10 mph (>6 mph for aerial applications), or a serious rainfall event is imminent. *(SOP)*
- Use drift control agents and low volatile formulations. *(SOP)*
- Conduct pre-treatment surveys for sensitive habitat and Special Status species within or adjacent to proposed treatment areas. *(SOP)*
- Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation. *(SOP)*
- Use drift reduction agents, as appropriate, to reduce the drift hazard to non-target species. *(SOP)*
- Turn off application equipment at the completion of spray runs and during turns to start another spray run. *(SOP)*
- Refer to the herbicide product label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. *(SOP)*
- Clean OHVs to remove plant material. *(SOP)*

The BLM has suspended the use of the adjuvant R-11.

Air Quality

See Manual 7000 (*Soil, Water, and Air Management*)

- Consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks. *(SOP)*
- Apply herbicides in favorable weather conditions to minimize drift. For example, do not treat when winds exceed 10 mph (>6 mph for aerial applications) or rainfall is imminent. *(SOP)*
- Use drift reduction agents, as appropriate, to reduce the drift hazard. *(SOP)*
- Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets [spray droplets of 100 microns and less are most prone to drift]). *(SOP)*
- Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources). *(SOP)*

Soil

See Manual 7000 (*Soil, Water, and Air Management*)

- Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected. *(SOP)*
- Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility. *(SOP)*
- Do not apply granular herbicides on slopes of more than 15% where there is the possibility of runoff carrying the granules into non-target areas. *(SOP)*

Water Resources

See Manual 7000 (*Soil, Water, and Air Management*)

- Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs. *(SOP)*
- Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments. *(SOP)*
- Use local historical weather data to choose the month of treatment. (*SOP*)
- Considering the phenology of target aquatic species, schedule treatments based on the condition of the water body and existing water quality conditions. *(SOP)*
- Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential stormwater runoff and water turbidity. *(SOP)*
- Review hydrogeologic maps of proposed treatment areas. Note depths to groundwater and areas of shallow groundwater and areas of surface water and groundwater interaction. Minimize treating areas with high risk for groundwater contamination. *(SOP)*
- Conduct mixing and loading operations in an area where an accidental spill would not contaminate an aquatic body. *(SOP)*
- Do not rinse spray tanks in or near water bodies. (*SOP*)
- Do not broadcast pellets where there is danger of contaminating water supplies. *(SOP)*
- Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment. *(SOP)*
- Establish appropriate (herbicide-specific) buffer zones for species/populations (Tables A2-1 and A2-2). (*MM*)
- Areas with potential for groundwater for domestic or municipal use shall be evaluated through the appropriate, validated model(s) to estimate vulnerability to potential groundwater contamination, and appropriate mitigation measures shall be developed if such an area requires the application of herbicides and cannot otherwise be treated with non-herbicide methods. (*MM*)
- Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths from water of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand spray applications. *(SOP)*

- Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide and site-specific conditions to minimize impacts to water bodies. *(SOP)*

Wetlands and Riparian Areas

- Use a selective herbicide and a wick or backpack sprayer. *(SOP)*
- Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths from water of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand spray applications. *(SOP)*
- See mitigation for Water Resources and Vegetation. (*MM*)

Vegetation

See Handbook H-4410-1 (*National Range Handbook*), and manuals 5000 (*Forest Management*) and 9015
(*Integrated Weed Management*)

- Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. *(SOP)*
- Use native or sterile plants for revegetation and restoration projects to compete with invasive plants until desired vegetation establishes. *(SOP)*
- Use weed-free feed for horses and pack animals. Use weed-free straw and mulch for revegetation and other activities. *(SOP)*
- Identify and implement any temporary domestic livestock grazing and/or supplemental feeding restrictions needed to enhance desirable vegetation recovery following treatment. Consider adjustments in the existing grazing permit, to maintain desirable vegetation on the treatment site. *(SOP)*
- Minimize the use of terrestrial herbicides (especially bromacil, diuron, and sulfometuron methyl) in watersheds with downgradient ponds and streams if potential impacts to aquatic plants are identified. (*MM*)
- Establish appropriate (herbicide-specific) buffer zones (Tables A2-1 and 2) around downstream water bodies, habitats, and species/populations of interest. Consult the ecological risk assessments (ERAs) prepared for the PEIS for more specific information on appropriate buffer distances under different soil, moisture, vegetation, and application scenarios. (*MM*)
- Limit the aerial application of chlorsulfuron and metsulfuron methyl to areas with difficult land access, where no other means of application are possible. (*MM*)
- Do not apply sulfometuron methyl aerially. (*MM*)
- When necessary to protect Special Status plant species, implement all conservation measures for plants presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment* (see Appendix 5). (*MM*)

Pollinators

- Complete vegetation treatments seasonally before pollinator foraging plants bloom. *(SOP)*
- Time vegetation treatments to take place when foraging pollinators are least active both seasonally and daily. *(SOP)*
- Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in patches rather than in one single treatment. *(SOP)*
- Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources. *(SOP)*
- Maintain herbicide free buffer zones around patches of important pollinator nectar and pollen sources. *(SOP)*
- Maintain herbicide free buffer zones around patches of important pollinator nesting habitat and hibernacula. *(SOP)*
- Make special note of pollinators that have single host plant species, and minimize herbicide spraying on those plants and in their habitats. *(SOP)*

Fish and Other Aquatic Organisms

See manuals 6500 (*Wildlife and Fisheries Management*) and 6780 (*Habitat Management Plans*)

- Use appropriate buffer zones based on label and risk assessment guidance. *(SOP)*
- Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments. *(SOP)*
- Use appropriate application equipment/method near water bodies if the potential for off-site drift exists. *(SOP)*
- For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to meet vegetation management objectives, 2) use the appropriate application method to minimize the potential for injury to desirable vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label. *(SOP)*
- Limit the use of diquat in water bodies that have native fish and aquatic resources. (*MM*)
- Limit the use of terrestrial herbicides (especially diuron) in watersheds with characteristics suitable for potential surface runoff that have fish-bearing streams during periods when fish are in life stages most sensitive to the herbicide(s) used. (*MM*)
- To protect Special Status fish and other aquatic organisms, implement all conservation measures for aquatic animals presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment* (see Appendix 5). (*MM*)
- Establish appropriate herbicide-specific buffer zones for water bodies, habitats, or fish or other aquatic species of interest (Tables A2-3 and A2-4, and recommendations in individual ERAs). (*MM*)
- Consider the proximity of application areas to salmonid habitat and the possible effects of herbicides on riparian and aquatic vegetation. Maintain appropriate buffer zones around salmonid-bearing streams. (*MM*)
- At the local level, consider effects to Special Status fish and other aquatic organisms when designing treatment programs. (*MM*)

Wildlife

See manuals 6500 (*Wildlife and Fisheries Management*) and 6780 (*Habitat Management Plans*)

- Use herbicides of low toxicity to wildlife, where feasible. *(SOP)*
- Use spot applications or low-boom broadcast operations where possible to limit the probability of contaminating non-target food and water sources, especially non-target vegetation over areas larger than the treatment area. *(SOP)*
- Use timing restrictions (e.g., do not treat during critical wildlife breeding or staging periods) to minimize impacts to wildlife. *(SOP)*
- To minimize risks to terrestrial wildlife, do not exceed the typical application rate for applications of dicamba, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr, where feasible. (*MM*)
- Minimize the size of application areas, where practical, when applying 2,4-D, bromacil, diuron, and Overdrive® to limit impacts to wildlife, particularly through contamination of food items. (*MM*)
- Where practical, limit glyphosate and hexazinone to spot applications in grazing land and wildlife habitat areas to avoid contamination of wildlife food items. (*MM*)
- Do not use the adjuvant R-11 (*MM*)
- Either avoid using glyphosate formulations containing POEA, or seek to use formulations with the least amount of POEA, to reduce risks to amphibians. (*MM*)
- Do not apply bromacil or diuron in rangelands, and use appropriate buffer zones (Tables A2-1 and 2) to limit contamination of off-site vegetation, which may serve as forage for wildlife. (*MM*)
- Do not aerially apply diquat directly to wetlands or riparian areas. (*MM*)

- To protect Special Status wildlife species, implement conservation measures for terrestrial animals presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment* (See Appendix 5) (*MM*)

Threatened, Endangered, and Sensitive Species

See Manual 6840 (*Special Status Species*)

- Provide clearances for Special Status species before treating an area as required by Special Status Species Program policy. Consider effects to Special Status species when designing herbicide treatment programs. *(SOP)*
- Use a selective herbicide and a wick or backpack sprayer to minimize risks to Special Status plants. *(SOP)*
- Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for Special Status species in area to be treated. *(SOP)*

Livestock

See Handbook H-4120-1 (*Grazing Management*)

- Whenever possible and whenever needed, schedule treatments when livestock are not present in the treatment area. Design treatments to take advantage of normal livestock grazing rest periods, when possible. *(SOP)*
- As directed by the herbicide product label, remove livestock from treatment sites prior to herbicide application, where applicable. *(SOP)*
- Use herbicides of low toxicity to livestock, where feasible. *(SOP)*
- Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target food and water sources. *(SOP)*
- Avoid use of diquat in riparian pasture while pasture is being used by livestock. *(SOP)*
- Notify permittees of the herbicide treatment project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. *(SOP)*
- Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary. *(SOP)*
- Provide alternative forage sites for livestock, if possible. *(SOP)*
- Minimize potential risks to livestock by applying diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr at the typical application rate where feasible. (*MM*)
- Do not apply 2,4-D, bromacil, dicamba, diuron, Overdrive®, picloram, or triclopyr across large application areas, where feasible, to limit impacts to livestock, particularly through contamination of food items. (*MM*)
- Where feasible, limit glyphosate and hexazinone to spot applications in rangeland. (*MM*)
- Do not apply bromacil or diuron in rangelands, and use appropriate buffer zones (Tables A2-1 and 2) to limit contamination of off-site vegetation, which may serve as forage for wildlife. (*MM*)

Wild Horses and Burros

- Minimize using herbicides in areas grazed by wild horses and burros. *(SOP)*
- Use herbicides of low toxicity to wild horses and burros, where feasible. *(SOP)*
- Remove wild horses and burros from identified treatment areas prior to herbicide application, in accordance with herbicide product label directions for livestock. *(SOP)*
- Take into account the different types of application equipment and methods, where possible, to reduce the probability of contaminating non-target food and water sources. *(SOP)*
- Minimize potential risks to wild horses and burros by applying diuron, glyphosate, hexazinone, tebuthiuron, and triclopyr at the typical application rate, where feasible, in areas associated with wild horse and burro use. (*MM*)
- Consider the size of the application area when making applications of 2,4-D, bromacil, dicamba, diuron, Overdrive®, picloram, and triclopyr in order to reduce potential impacts to wild horses and burros. (*MM*)

- Apply herbicide label grazing restrictions for livestock to herbicide treatment areas that support populations of wild horses and burros. (*MM*)
- Where practical, limit glyphosate and hexazinone to spot applications in rangeland. (*MM*)
- Do not apply bromacil or diuron in grazing lands within herd management areas (HMAs), and use appropriate buffer zones identified in Tables A2-1 and 2 to limit contamination of vegetation in off-site foraging areas. (*MM*)
- Do not apply 2,4-D, bromacil, or diuron in HMAs during the peak foaling season (March through June, and especially in May and June), and do not exceed the typical application rate of Overdrive® or hexazinone in HMAs during the peak foaling season in areas where foaling is known to take place. (*MM*)

<u>Cultural Resources and Paleontological Resources</u>

See handbooks H-8120-1 (*Guidelines for Conducting Tribal Consultation*) and H- 8270-1 (*General Procedural Guidance for Paleontological Resource Management*), and manuals 8100 (*The Foundations for Managing Cultural Resources*), 8120 (*Tribal Consultation Under Cultural Resource Authorities*),and 8270 (*Paleontological Resource Management*). See also: *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act*.

- Follow standard procedures for compliance with Section 106 of the National Historic Preservation Act as implemented through the *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act* and State protocols or 36 Code of Federal Regulations Part 800, including necessary consultations with State Historic Preservation Officers and interested tribes. *(SOP)*
- Follow BLM Handbook H-8270-1 (*General Procedural Guidance for Paleontological Resource Management*) to determine known Condition I and Condition 2 paleontological areas, or collect information through inventory to establish Condition 1 and Condition 2 areas, determine resource types at risk from the proposed treatment, and develop appropriate measures to minimize or mitigate adverse impacts. *(SOP)*
- Consult with tribes to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments; work with tribes to minimize impacts to these resources. *(SOP)*
- Follow guidance under Human Health and Safety in the PEIS in areas that may be visited by Native peoples after treatments. *(SOP)*
- Do not exceed the typical application rate when applying 2,4-D, bromacil, diquat, diuron, fluridone, hexazinone, tebuthiuron, and triclopyr in known traditional use areas. (*MM*)
- Avoid applying bromacil or tebuthiuron aerially in known traditional use areas. (*MM*)
- Limit diquat applications to areas away from high residential and traditional use areas to reduce risks to Native Americans. (*MM*)

<u>Visual Resources</u>

See handbooks H-8410-1 (*Visual Resource Inventory*) and H-8431-1 (*Visual Resource Contrast Rating*), and manual 8400 (*Visual Resource Management*)

- Minimize the use of broadcast foliar applications in sensitive watersheds to avoid creating large areas of browned vegetation. *(SOP)*
- Consider the surrounding land use before assigning aerial spraying as an application method. *(SOP)*
- Minimize off-site drift and mobility of herbicides (e.g., do not treat when winds exceed 10 mph; minimize treatment in areas where herbicide runoff is likely; establish appropriate buffer widths between treatment areas and residences) to contain visual changes to the intended treatment area. *(SOP)*

- If the area is a Class I or II visual resource, ensure that the change to the characteristic landscape is low and does not attract attention (Class I), or if seen, does not attract the attention of the casual viewer (Class II). *(SOP)*
- Lessen visual impacts by: 1) designing projects to blend in with topographic forms; 2) leaving some low-growing trees or planting some low-growing tree seedlings adjacent to the treatment area to screen short-term effects; and 3) revegetating the site following treatment. *(SOP)*
- When restoring treated areas, design activities to repeat the form, line, color, and texture of the natural landscape character conditions to meet established Visual Resource Management (VRM) objectives. *(SOP)*

Wilderness and Other Special Areas

See handbooks H-8550-1 (*Management of Wilderness Study Areas (WSAs)*), and H-8560-1 (*Management of Designated Wilderness Study Areas*), and Manual 8351 (*Wild and Scenic Rivers*)

- Encourage backcountry pack and saddle stock users to feed their livestock only weed-free feed for several days before entering a wilderness area, and to bring only weed-free hay and straw onto BLM lands. *(SOP)*
- Encourage stock users to tie and/or hold stock in such a way as to minimize soil disturbance and loss of native vegetation. *(SOP)*
- Revegetate disturbed sites with native species if there is no reasonable expectation of natural regeneration. *(SOP)*
- Provide educational materials at trailheads and other wilderness entry points to educate the public on the need to prevent the spread of weeds. *(SOP)*
- Use the "minimum tool" to treat noxious weeds and other invasive plants, relying primarily on the use of ground-based tools, including backpack pumps, hand sprayers, and pumps mounted on pack and saddle stock. *(SOP)*
- Use herbicides only when they are the minimum treatment method necessary to control weeds that are spreading within the wilderness or threaten lands outside the wilderness. *(SOP)*
- Give preference to herbicides that have the least impact on non-target species and the wilderness environment. *(SOP)*
- Implement herbicide treatments during periods of low human use, where feasible. *(SOP)*
- Address wilderness and special areas in management plans. *(SOP)*
- Control of weed infestations shall be carried out in a manner compatible with the intent of Wild and Scenic River management objectives. *(SOP)*
- Mitigation measures that may apply to wilderness and other special area resources are associated with human and ecological health and recreation (see mitigation measures for Vegetation, Fish and Other Aquatic Resources, Wildlife Resources, Recreation, and Human Health and Safety). (*MM*)

Recreation

See Handbook H-1601-1 (*Land Use Planning Handbook, Appendix C*)

- Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species. *(SOP)*
- Notify the public of treatment methods, hazards, times, and nearby alternative recreation areas. *(SOP)*
- Adhere to entry restrictions identified on the herbicide product label for public and worker access. *(SOP)*
- Post signs noting exclusion areas and the duration of exclusion, if necessary. *(SOP)*
- Mitigation measures that may apply to recreational resources are associated with human and ecological health (see mitigation measures for Vegetation, Fish and Other Aquatic Resources, Wildlife Resources, and Human Health and Safety). (*MM*)

Social and Economic Values

- Consider surrounding land use before selecting aerial spraying as a treatment method, and avoid aerial spraying near agricultural or densely-populated areas. *(SOP)*
- Post treated areas and specify reentry or rest times, if appropriate. *(SOP)*
- Notify grazing permittees of livestock feeding restrictions in treated areas, if necessary, as per herbicide product label instructions. *(SOP)*
- Notify the public of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. *(SOP)*
- Control public access until potential treatment hazards no longer exist, per herbicide product label instructions. *(SOP)*
- Observe restricted entry intervals specified by the herbicide product label. *(SOP)*
- Notify local emergency personnel of proposed treatments. *(SOP)*
- Use spot applications or low-boom broadcast applications where possible to limit the probability of contaminating non-target food and water sources. *(SOP)*
- Consult with Native American tribes to locate any areas of vegetation that are of significance to the tribes and Native groups and that might be affected by herbicide treatments. *(SOP)*
- To the degree possible within the law, hire local contractors and workers to assist with herbicide application projects and purchase materials and supplies for herbicide treatment projects (including the herbicides) through local suppliers. *(SOP)*
- To minimize fears based on lack of information, provide public educational information on the need for vegetation treatments and the use of herbicides in an integrated vegetation management program for projects proposing local use of herbicides. *(SOP)*

Rights-of-way

- Coordinate vegetation treatment activities where joint or multiple use of a ROW exists. *(SOP)*
- Notify other public land users within or adjacent to the ROW proposed for treatment. *(SOP)*
- Use only herbicides that are approved for use in ROW areas. *(SOP)*

Human Health and Safety

- Establish a buffer between treatment areas and human residences based on guidance given in the HHRA, with a minimum buffer of ¼ mile for aerial applications and 100 feet for ground applications, unless a written waiver is granted. *(SOP)*
- Use protective equipment as directed by the herbicide product label. *(SOP)*
- Post treated areas with appropriate signs at common public access areas. *(SOP)*
- Observe restricted entry intervals specified by the herbicide product label. *(SOP)*
- Provide public notification in newspapers or other media where the potential exists for public exposure. *(SOP)*
- Store herbicides in secure, herbicide-approved storage. (*SOP*)
- Have a copy of MSDSs at work site. *(SOP)*
- Notify local emergency personnel of proposed treatments. *(SOP)*
- Contain and clean up spills and request help as needed. *(SOP)*
- Secure containers during transport. *(SOP)*
- Follow label directions for use and storage. *(SOP)*
- Dispose of unwanted herbicides promptly and correctly. *(SOP)*
- Use the typical application rate, where feasible, when applying 2,4-D, bromacil, diquat, diuron, fluridone, hexazinone, tebuthiuron, and triclopyr to reduce risk to workers and the public. (*MM*)
- Avoid applying bromacil and diuron aerially. Do not apply sulfometuron methyl aerially. (*MM*)
- Limit application of chlorsulfuron via ground broadcast applications at the maximum application rate. (*MM*)
- Limit diquat application to ATV, truck spraying, and boat applications to reduce risks to workers; limit diquat applications to areas away from high residential and subsistence use to reduce risks to the public. (*MM*)

- Evaluate diuron applications on a site-by-site basis to avoid risks to humans. There appear to be few scenarios where diuron can be applied without risk to workers. (*MM*)
- Do not apply hexazinone with an over-the-shoulder broadcast applicator (backpack sprayer). (*MM*)

TABLE A2-1. Buffer Distances to MinimizeRisk to Vegetation from Off-SiteDrift of BLM-Evaluated Herbicides

Application Scenario	BROM[1]	CHLR[1]	DIQT[1]	DIUR[1]	FLUR[1]	IMAZ[1]	OVER[1]	SULF[1]	TEBU[1]
Buffer Distance (feet) from Non-target Aquatic Plants									
Typical Application Rate									
Aerial	NA	0	NE	NA	NE	0	NA	1,300	NE
Low Boom[2]	100	0	NE	900	NE	0	100	900	0
High Boom[2]	900	0	NE	1,000	NE	0	900	900	0
Maximum Application Rate									
Aerial	NA	300	NE	NA	NE	300	NA	1,500	NE
Low Boom[2]	900	0	NE	1,000	NE	0	900	900	0
High Boom[2]	900	0	NE	1,000	NE	0	900	900	0
Buffer Distance (feet) from Non-target Terrestrial Plants									
Typical Application Rate									
Aerial	NA	1,350	1,200	NA	NE	0	NA	0	NE
Low Boom[2]	950	900	100	0	NE	0	0	0	0
High Boom[2]	950	900	900	100	NE	0	100	0	0
Maximum Application Rate									
Aerial	NA	1,350	1,200	NA	NE	900	NA	0	NE
Low Boom[2]	1,000	1,000	900	200	NE	0	100	0	50
High Boom[2]	1,000	1,000	900	500	NE	0	100	0	50
Buffer Distance (feet) from Threatened, Endangered, and Sensitive Plants									
Typical Application Rate									
Aerial	NA	1,400	1,200	NA	NE	0	NA	1,500	NE
Low Boom[2]	1,200	1,000	900	1,000	NE	0	100	1,100	0
High Boom[2]	1,200	1,000	900	1,000	NE	0	900	1,000	50
Maximum Application Rate									
Aerial	NA	1,400	1,200	NA	NE	900	NA	1,500	NE
Low Boom[2]	1,200	1,050	1,000	1,000	NE	0	900	1,100	100
High Boom[2]	1,200	1,000	1,000	1,000	NE	0	900	1,000	500

[1] BROM = Bromacil; CHLR = Chlorsulfuron; DIQT = Diquat; DIUR = Diuron; FLUR = Fluridone; IMAZ = Imazapic; OVER = Diflufenzopyr + Dicamba (Overdrive); SULF = Sulfometuron methyl; and TEBU = Tebuthiuron.

[2] High boom is 50 inches above ground and low boom is 20 inches above ground.

NE = Not evaluated and NA = not applicable.

Buffer distances are the smallest modeled distance at which no risk was predicted. In some cases, buffer distances were extrapolated if the largest distance modeled still resulted in risk, or interpolated if greater precision was required.

Table A2-2. Buffer Distances to MinimizeRisk to Vegetation from Off-SiteDrift of Forest Service- Evaluated Herbicides

Application Scenario	2,4-D	Dicamba	Clopyralid	Glyphosate	Hexazinone	Imazapyr	Metsulfuron Methyl	Picloram	Triclopyr
				Buffer Distance (feet) from Susceptible Plants[1]					
Typical Application Rate									
Aerial	NE	>900	900	300	300	900	900	>900	500
Low Boom	NE	300	900	50	NE	900	900	>900	300
Maximum Application Rate									
Aerial	NE	>900	1,000	300	900	>900	>900	>900	>900
Low Boom	NE	900	1,000	300	NE	>900	>900	>900	>900
				Buffer Distance (feet) from Tolerant Terrestrial Plants					
Typical Application Rate									
Aerial	NE	0	0	25	NE	100	50	25	NE
Low Boom	NE	0	0	25	0	25	25	25	NE
Maximum Application Rate									
Aerial	NE	0	25	50	NE	300	100	50	NE
Low Boom	NE	0	25	25	100	50	25	25	NE

NE = Not evaluated.

Buffer distances are the smallest modeled distance at which no risk was predicted. In some cases, buffer distances were extrapolated if the largest distance modeled still resulted in risk, or interpolated if greater precision was required.

[1] Mitigation measures for Bureau Sensitive or Federally Listed species use these buffer distances

Table A2-3. Buffer Distances to MinimizeRisk to Non-Special Status Fish and Aquatic Invertebrates from Off- SiteDrift of BLM-Evaluated Herbicides from Broadcast and Aerial Treatments

Application Scenario	BROM[1]	CHLR	DIQT	DIUR	FLUR	IMAZ	OVER	SULF	TEBU
				Minimum Buffer Distance (feet) from Fish and Aquatic Invertebrates					
Typical Application Rate									
Aerial	NA	0	NA	NA	NA	0	NA	0	NA
Low boom	0	0	NA	0	NA	0	0	0	0
High boom	0	0	NA	0	NA	0	0	0	0
Maximum Application Rate									
Aerial	NA	0	NA	NA	NA	0	NA	0	NA
Low boom	0	0	NA	100	NA	0	0	0	0
High boom	0	0	NA	100	NA	0	0	0	0

[1] BROM = Bromacil; CHLR = Chlorsulfuron; DIQT = Diquat; DIUR = Diuron; FLUR = Fluridone; IMAZ = Imazapic; OVER = Diflufenzopyr + Dicamba (Overdrive); SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.

NA = Not applicable.

Boom height = The Tier I ground application model allows selection of a low (20 inches) or a high (50 inches) boom height.

Table A2-4. Buffer Distances to Minimize Risk to Special Status Fish and Aquatic Organisms from Off-Site Drift of BLM-Evaluated Herbicides from Broadcast and Aerial Treatments

Application Scenario	BROM[1]	CHLR	DIQT	DIUR	FLUR	IMAZ	OVER	SULF	TEBU
	Minimum Buffer Distance (feet) from Fish and Aquatic Invertebrates								
Typical Application Rate									
Aerial	NA	0	NA	NA	NA	0	NA	0	NA
Low boom	0	0	NA	0	NA	0	0	0	0
High boom	0	0	NA	100	NA	0	0	0	0
Maximum Application Rate									
Aerial	NA	0	NA	NA	NA	0	NA	0	NA
Low boom	0	0	NA	100	NA	0	0	0	0
High boom	0	0	NA	900	NA	0	0	0	0

[1] BROM = Bromacil; CHLR = Chlorsulfuron; DIQT = Diquat; DIUR = Diuron; FLUR = Fluridone; IMAZ = Imazapic; OVER = Diflufenzopyr + Dicamba (Overdrive); SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.

NA = Not applicable.

Boom height = The Tier I ground application model allows selection of a low (20 inches) or a high (50 inches) boom height.