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Upton Mountain Allotment Management Plan
DOI-BLM-ORWA-B050-2013-0021-EA

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UPTON MOUNTAIN ALLOTMENT MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT
BLM-ORWA-B050-2013-0021-EA

I. INTRODUCTION

The Bureau of Land Management (BLM) is analyzing the proposed Allotment Management Plan (AMP) for the Upton Mountain Allotment #5565 (allotment) to prescribe the livestock grazing practices necessary to meet specific resource objectives. The allotment is located approximately 37 miles east of Burns, Oregon and contains approximately 13,714 acres of BLM land and 448 acres of private land for a total of 14,162 acres. The allotment is divided into three pastures: North Bartlett, South Bartlett, and Upton Mountain.

Grazing management on the Upton Mountain Allotment needs to change because wildfires have completely changed the setting since the last AMP was written. The grazing permit was transferred to a new permittee in 2010. In a letter received December 13, 2010, they requested changes to the existing grazing permit to better fit their ranching business. This AMP was developed using an Interdisciplinary Team (IDT) in coordination with the livestock permittee, interested publics, and Oregon Department of Fish and Wildlife (ODFW) to conform to the BLM Oregon and Washington (OR/WA) Standards for Rangeland Health (Standards) and Guidelines (Guidelines) for Livestock Grazing Management (BLM, 1997) (S&Gs when referring to both). Implementation of the changes to grazing management would result in issuing a 10-year grazing permit to the permittee. The AMP includes six new range improvement projects. The AMP would be evaluated every 5 years because this is an “Improve” (I) category allotment.

A. Purpose and Need for Action

The BLM’s purposes (goals), in this environmental assessment (EA) are to manage the Upton Mountain Allotment to make significant progress toward or achieve all the Standards, particularly habitat for Greater Sage-Grouse (part of Standard 5), and to help address the related issues of invasive annual grasses, fine fuels, and repeated fires. It is also a goal to develop an AMP for the Upton Mountain Allotment that addresses resource conditions on the allotment and livestock management to help address those conditions and to authorize adequate infrastructure to help manage invasive annual grasses and standing dead-crested wheatgrass. The need is to address the permittee’s request to change grazing management to fit the allotment into their ranching operation.

The 2007 Bartlett Mountain Fire moved late seral sagebrush steppe communities to early seral perennial grass plant communities and invasive annual grass/perennial grass plant communities. In most years, total annual production is similar to pre-fire; however, perennial and invasive annual grasses now account for almost all that production and sagebrush very little. This means there is much more grass now than before the 2007 fire. However the management in the existing AMP is for conditions before the fire. The result is expansion of invasive annual grasses and standing dead litter, especially in crested wheatgrass plants, resulting in a buildup of fine fuels. The large amount and continuity of fine fuel increases the chances for another large fire. Repeated wildfires reduce the ability of the allotment to recover to late seral plant communities and increase

invasive annual grass' competitive advantage. Many years without fire are required for late seral sagebrush steppe plant communities to return.

The amount of invasive annual grass is part of the reason that Standards 1, 3, and 5 are not being achieved. Invasive annual grasses occur throughout the allotment, facilitated by repeated fires. In some areas they are the ecologically dominant species, although still intermixed with perennial grasses. Invasive annual grasses are damaging to ecological function. They simplify plant community composition and homogenize plant community structure which in turn degrades function and wildlife habitat values. Invasive annual grasses create continuous fine fuels that increase the risk of large and catastrophic wildfire. These areas may also cross a threshold to invasive annual grass-wildfire cycle plant communities, which further reduces native vegetation and decreases the ability of the site to function properly or attain later seral stages. Small parts of the South Bartlett Pasture have burned four times since 1996 and may have crossed this threshold.

Of the 21 stock water locations on the allotment, 9 are ponds that collect runoff water. Later in the summer and during drought years, some of these ponds dry up. If this happens, livestock tend to congregate in areas near remaining water. Reliable, well-distributed drinking water facilitates livestock use of low quality forages including invasive annual grasses and dormant crested wheatgrass. It helps control fine fuels.

The BLM needs to respond to the permittee's request to modify his permitted grazing use on the Upton Mountain Allotment.

B. Decision to be Made

The BLM will determine the grazing management and projects to be included in an updated or new AMP.

1. Conformance with BLM Resource Management Plan(s)

The Proposed Action and alternatives are in conformance with the 1992 Three Rivers Resource Management Plan (RMP)/Record of Decision (ROD), even though they are not specifically provided for, because they are clearly consistent with the following RMP decisions. Some of this direction was implemented in the 2005 Allotment Management Plan (AMP):

- "Implement management practices to resolve conflicts and concerns and meet multiple-use objectives identified in Appendix 9, …." (GM 1.1, p. 2-33).

- "Develop, modify, or revise AMPs or Coordinated Resource Management Plans (CRMPs) which identify allotment specific multiple-use management objectives and grazing systems…." (GM 1.1.1, p. 2-33).

- "Adjust overall grazing management practices as necessary to protect special status species and to maintain or enhance their habitat." (SSS 2.1, p. 2-57).

- "Allow no sagebrush removal within 2 miles of sage grouse strutting grounds when determined by a wildlife biologist to be detrimental to sage grouse habitat requirements." (SSS 3.2, p. 2-60).

- Improve and maintain erosion condition in moderate or better erosion condition. (Appendix 9, p. Appendices 111). The change from late successional sagebrush with open interplant spaces to early succession grass plant communities with more ground cover reduced the threat of accelerated erosion.

- Protect Special Status Species (SSS) or its habitat from impact by BLM-authorized actions (RMP Appendix 9, p. Appendices 111) (AMP Ch. 1, Sec. C-2, 3).

- Maintain or improve rangeland condition and productivity through a change in management practices and/or reduction in active use (RMP Appendix 9, p. Appendices 111) (AMP Ch. 1, Sec. C-1, 5). Improving rangeland condition remains an applicable objective. The current purpose is to help control medusahead rye *(Taeniatherum caput-medusae*) (TACA) and cheatgrass (*Bromus tectorum*) (BRTE) and manage fine fuels. Vegetation conversion from late seral sagebrush steppe to early seral perennial and annual grasses means that inadequate forage production is no longer a problem.

- Range improvements will meet the Standard Procedures and Design Elements shown in Appendix 12 (RMP GM 1.3, p. 2-36) (AMP Ch. 1, Sec. C-2, 3).

- Adjust overall grazing management practices as necessary to protect SSS and to maintain or enhance their habitat (RMP SSS 2.1, p. 2-57). Currently, sage-grouse and sage-grouse habitat exist within the allotment. There are 11,896 acres of sage-grouse priority habitat management area (PHMA) and 2,266 acres of general habitat management area (GHMA). There are eight documented sites of *Stanleya confertiflora* (STCO2) (Malheur prince's plume) totaling approximately 211 acres.

- Fence overflow area at all spring developments to provide meadow habitat for sage-grouse (RMP SSS 3.3, p. 2-60) and cause upward trend in riparian vegetation (AMP Ch.1 Sec. C-5). This does not appear to be needed at the Bartlett Mountain Spring development because of the steep uphill climb from the trough to the spring source. Photo monitoring would be used to document condition of the spring source to track whether this conclusion is correct.

- Implement a rotation or deferred grazing system on all allotments within big game ranges (RMP WL1.2, p. 2-66).

2. Consistency with Laws, Regulations, and Policies

The proposed action has been designed to conform to 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.

- National Environmental Policy Act (42 U.S.C. 4320-4347) (NEPA), 1969.

- Federal Land Policy and Management Act (43 U.S.C. 1701) (FLPMA), 1976.
- Public Rangelands Improvement Act (43 U.S.C. 1901), 1978.
- National Historic Preservation Act (16 U.S.C. 470 et seq.), 1966.
- Standards for Rangeland Health and Guidelines for Livestock.
- Management for Public Lands Administered by the BLM in the States of Oregon and Washington, August 12, 1997.
- Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Environmental Impact Statement (EIS), 2007.
- Vegetation Treatments Using Herbicides on BLM lands in Oregon Final Environmental Impact Statement (FEIS), 2010.
- Burns District Noxious Weed Management Program EA (OR-020-98-05), 1998 (and its successors).
- Greater Sage-Grouse and Sagebrush Steppe Ecosystems Management Guidelines (BLM, 2000).
- Clean Water Act (33 U.S.C. 1251-1387), 1972.
- BLM National Sage-grouse Habitat Conservation Strategy, 2004.
- Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (Hagen 2011).
- Washington Office (WO) Instructional Memorandum (IM) 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures.
- Executive Order 13112, Invasive Species.
- Three Rivers RMP/ROD, 1992.
- State, local, and Tribal laws, regulations, and land use plans (LUP).
- All other Federal laws which are relevant to this document, even if not specifically identified.

C. Scoping and Identification of Issues

Internal scoping was conducted through IDT meetings and field visits. The issues that were identified included: Greater Sage-Grouse habitat condition, invasive annual grasses, fine fuel accumulation, fire, protection of investments in fire suppression and rehabilitation, SSS plants, livestock management, and water availability.

External scoping and AMP development included three tours on the Upton Mountain Allotment. On May 13, 2013, BLM and ODFW personnel, including the ODFW sage-grouse lead, toured the allotment. The topics discussed were sage-grouse habitat conditions, populations, winter grazing, invasive annual grass, and fine fuel management. On July 16, 2013, Burns BLM conducted a tour with representatives of Oregon Natural Desert Association (ONDA). The topics discussed included invasive annual grasses, how to address livestock management as the invasive annual grasses decrease, targeted grazing, and management of sage-grouse habitat. The limited amount of sagebrush in the allotment and possible restoration actions were also discussed. On September 9, 2014, the Upton Mountain Allotment was part of the Buzzard Complex Emergency Stabilization and Rehabilitation (ES&R) field tour that included ODFW, ONDA, Burns Paiute Tribe, the US Fish and Wildlife Service (USFWS), Harney County, Oregon Cattlemen's Association, the Agricultural Research Service, Oregon State University (OSU), and the Vale District. The additional issues that came from this meeting were seeded species, methods and timing, and long term, post-ES&R vegetation management.

1. Lands with Wilderness Characteristics

The BLM's 1980 wilderness inventory found wilderness character not present on BLM-administered lands within Upton Mountain Allotment.

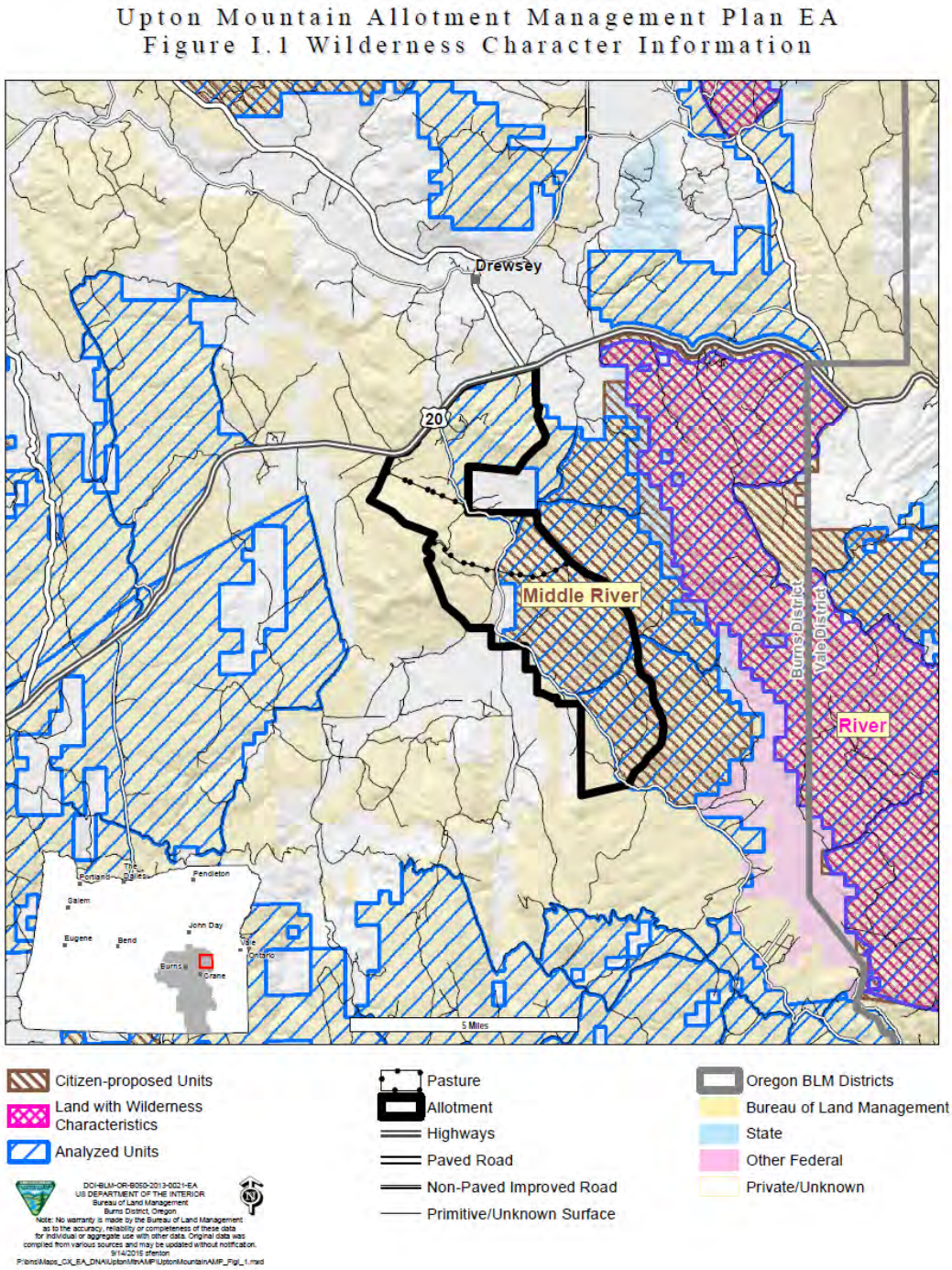
In 2007, a citizen's proposed Wilderness Study Area (WSA), called Middle River, containing 56,535 acres was submitted (Figure I.1). The area is bordered on the north by Highway 20 and private property, on the south by Warm Springs Road and Warm Springs Reservoir, on the east by Juntura-Riverside Road, and on the west by Warm Springs Road.

In 2011 and 2012, a BLM IDT conducted wilderness inventory maintenance (WIM) of the proposed WSA. The BLM IDT reviewed all information submitted by the public and conducted route analysis. The IDT determined that two wilderness inventory units were present within this allotment: Upton Mountain and Medusahead.

The Upton Mountain Unit met the size requirement (5,567 acres) and the naturalness criteria, but did not meet the criteria for outstanding opportunities for solitude or for primitive and unconfined recreation. Vegetation and topography within the unit provide little screening. Therefore, outstanding opportunities for solitude are not present. Outstanding opportunity for primitive and unconfined recreation is not present since the unit possesses no special or unique properties to specifically draw recreationists to the area.

The Medusahead Unit met the size requirement (8,142 acres). However the unit did not meet any other inventory criteria: naturalness, outstanding opportunities for solitude, or primitive and unconfined recreation.

Figure I.1: Wilderness Character Information



2. Greenhouse Gas Emissions and Climate Change

Greenhouse gas emissions and climate change will not be analyzed in this EA for the following reason: the Burns District has considered greenhouse gas emissions and climate change in several AMPs (Cluster AMP, page 6, 2011; Cottonwood Creek AMP, page 9, 2011; and Chalk Hills AMP, page 8, 2010) and all have concluded the emissions did not meet the reporting threshold of 25,000 metric tons. Estimates for grazing cattle typically range from 80 to 101 kilograms of methane per year per animal (Environmental Protection Agency (EPA), 2009) or 6.7 to 9.2 kilograms of methane per month. Assuming an emission rate of 8 kilograms of methane per AUM and methane has a global warming potential 21 times carbon dioxide (EPA 2009, p. ES-3), each AUM results in 0.168 metric ton of carbon dioxide equivalent. In order to meet or exceed the 25,000 metric ton threshold, over 148,809 AUMs would have to be authorized. The total permitted AUMs currently are 1,615. This would account for 12,920 kilograms of methane. If the Proposed Action were to be put into effect there would then be 2,386 AUMs of permitted use, which would account for 19,088 kilograms of methane. These estimates are below the reporting threshold.

II. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Alternatives A through D are fully analyzed in Chapter III of this EA. Following the public review period for this document, a proposed decision will be issued by the field manager, who may select one of the alternatives analyzed or portions of multiple alternatives.

A. Actions Common to All Alternatives

1. Adaptive Management and Flexibility

Adaptive management is a management concept based on clearly identified outcomes; monitoring to determine if management actions are meeting desired outcomes; and, if not, facilitating management changes that would best ensure outcomes are met or reevaluated. Adaptive management recognizes that knowledge about natural resource systems includes unknowns. Adaptive management affords an opportunity for improved understanding. The Proposed Action probably contains more actions than BLM can reasonably implement during the term of a subsequent grazing permit. If monitoring finds the need to implement other actions, hopefully analysis of all the components of the Proposed Action in this EA will incorporate some applicable adjustments that could be implemented.

The following **Figure II.1** illustrates the adaptive management process (Williams et al. 2007).

Figure II.1: http://www.for.gov.bc.ca/hfp/amhome/images/diagram-AM-6step-process.gif

2. Monitoring

BLM specialists, in coordination with the permittee and other participating or interested parties, will monitor effects of fall/winter targeted grazing, vegetation trend, utilization, sage-grouse male lek attendance, medusahead rye and noxious weed treatments, shrub condition/status, Bartlett Mountain Spring riparian condition, and SSS plant populations.

Upland vegetation trend will be monitored using Modified Pace 180° (Johnson and Sharp 2012) and permanent photo points (Rangeland Monitoring: Trend Studies 1984 Technical Reference (TR) 4400-4). Observed apparent trend and soil surface factor would be assessed at each trend plot. Upland trend data would be collected and evaluated on 5-year intervals. During the targeted grazing study, and to track the results of fall/winter grazing, some trend transects and photo points may be read more frequently. Currently, there are ten trend monitoring plots within the allotment. Two are unburned. The other eight monitor various combinations of burned, rehabilitated, and targeted grazing.

Utilization would be monitored yearly after each pasture move. The modified Key Forage Plant Method will be used to measure utilization in each pasture. Target utilization levels are 50% for native perennial bunchgrasses and 60% for crested wheatgrass. Utilization would be monitored bi-weekly if winter grazing extends beyond the permit date for targeted grazing of invasive annual grasses (Alternative B). Grazing management will also be monitored annually through use supervision and actual use reports.

Aerial and ground photographic monitoring of medusahead rye (Ndzeidze 2011) would be conducted on the Upton Mountain Allotment and surrounding areas to identify infestations and track the effectiveness of integrated vegetation management.

Lek counts are conducted annually using ODFW protocols on the leks in the area of the allotment. Neither of the two closest leks are trend leks. If lek counts and vegetation monitoring showed that the implemented alternative was degrading sage-grouse habitat values, it would be stopped and reevaluated.

New monitoring includes:

- Establish thirteen sagebrush/shrub monitoring sites in eight focus areas.
- Establish two Cole Browse transects to monitor bitterbrush or other browse species stands in the Upton Mountain Pasture (part of the thirteen new monitoring sites).
- Establish new photo point monitoring at the Bartlett Mountain Spring source to track riparian condition. Re-photograph annually for the first 5 years after reconstruction, and then at 5-year intervals.
- The monitoring data plus all other applicable information would be used to determine whether allotment objectives and Standards are being met.

B. Alternative A: No Action Alternative

The No Action Alternative is the status quo alternative and is used as a basis of comparison for other alternatives. With the No Action Alternative, BLM would continue to authorize the current permitted use with a renewed 10-year term grazing permit issued to the permittee. The grazing permit's terms and conditions would be the same as on the current permit, including use of the 2005 AMP. The permit would authorize 1,615 animal unit months (AUM) permitted use and 771 AUMs suspended use. The season of use would be April 1 through November 30.

The grazing schedule (Figure II.2) would provide graze/defer grazing treatments for Upton and North Bartlett Pastures and deferred grazing treatments for South Bartlett Pasture.

Under this alternative, no new range improvement projects would be constructed. Targeted grazing of invasive annual grasses is not part of this alternative, although they could be grazed in the spring- or fall-use pastures. Target utilization would be 50% for native perennial grasses and 60% for crested wheatgrass.

Figure II.2: Alternative A, No Action Grazing Schedule

Year	Pasture	Livestock #s	Season of Use	AUMS
1	Upton Mountain	200	04/10–06/30	539
	South Bartlett	200	07/01–08/15	302
	North Bartlett	150	10/01–11/15	227
	Subtotal			1,068
	“Voluntary” nonuse			547
	TOTAL			1,615
2	North Bartlett	200	04/15–06/15	408
	South Bartlett	200	06/16–08/15	401
	Upton Mountain	150	09/15–10/31	232
	Subtotal			1,041
	“Voluntary” nonuse			574
	TOTAL			1,615

C. Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

Under the Proposed Action Alternative BLM would issue a 10-year term grazing permit to the permittee. Under this alternative the BLM would activate 771 AUMs of suspended use. The permitted use would increase from 1,615 AUMs to 2,386 AUMs. The season of use would change to March 1 through February 28. The typical number of livestock would change to 450. Targeted grazing of invasive annual grasses would occur during the fall/winter season of use. The typical use periods would be April, May, and September through December. Target utilization would be 60% for crested wheatgrass and 50% for native perennial bunchgrasses. Livestock would be removed prior to exceeding these targets whether permitted AUMs had been used or not. After-the-fact billing (actual use billing) would be implemented based on the actual use report due 15 days after livestock grazing ends.

Livestock grazing management: North and South Bartlett Pastures would be used April and May in a flip flop two-year rotation. The Upton Mountain Pasture would be grazed annually in the fall/winter at least until the medusahead rye and cheatgrass were reduced to acceptable levels based on ecological site descriptions (ESD) and weather. The beginning target would be 10% composition of invasive annual grasses in the trend monitoring plots and the medusahead rye herbicide treatment monitoring. The proposed

rotation would provide periodic growing season rest in all pastures. The proposed pasture rotation is in Figure II.3.

Figure II.3: Alternative B, Typical Grazing Rotation

Year	Pasture	Cow Numbers	Use Dates	AUMs
1	North Bartlett	450	04/01–04/30	444
	South Bartlett	450	05/01–05/31	459
	Upton Mountain	450	09/07–12/15	1,479
	Subtotal			2,382
2	South Bartlett	450	04/01–04/30	444
	North Bartlett	450	05/01–05/31	459
	Upton Mountain	450	09/07–12/15	1,479
	Subtotal			2,382

On December 15 in the fall/winter pasture, if utilization on native bunchgrasses is 35% or less at the end of the use period and the cattle continue to target medusahead rye and cheatgrass, use above the planned 1,479 AUMs could be permitted (43 CFR 4190.1(a)(1)). The low estimated carrying capacity for the allotment is 1,295 AUMs greater than the proposed 2,386 active use AUMs (carrying capacity estimates are in Appendix C). Under Alternative B, up to 1,295 AUMs over permitted use could be authorized in the fall/winter-use pasture. Targeted grazing could be permitted until native bunchgrass utilization reached 50% or when the cattle quit eating invasive annual grasses. If 50% utilization target on native bunchgrasses is reached, livestock would be removed immediately. Utilization would be monitored bi-weekly during extended use for targeted grazing. Such use would be based on availability and continued selection of medusahead rye, cheatgrass, and fine fuels, and not guaranteed from year to year. The BLM and the permittee would talk bi-weekly to track forages selected, protein supplement locations, cattle performance, and weather conditions. Protein supplement would be used in the fall/winter pasture to increase selection of medusahead rye, cheatgrass, and other low quality dormant forages. The supplement would be a liquid or dry commercial product placed in tubs. Supplement tubs would be placed 1/4 mile or further from sagebrush, bitterbrush, or other shrub stands identified by the wildlife biologist. Protein supplement tubs would be placed on two tracks, in existing disturbed spots, or in patches of medusahead rye. Targeted grazing would be implemented in conformance with 43 CFR 4190.1(a)(1) which provides for biological thinning for fuels reduction to prevent or reduce the chances of wildfire. The fire reduction or prevention would occur in the subsequent fire season. The need for targeted grazing would be determined each year, based on conditions. There would be no guarantee that extra use

for targeted grazing would be offered in any given year. The amount and results of targeted grazing during this proposed permit period would be information used in the subsequent permit renewal decision.

1. Range Improvements

The proposed range improvements are shown in Figure II.4. Potential range improvements will be described in detail after which they will be named, but not described again. All of the North Bartlett and South Bartlett Pastures and approximately the north half of the Upton Mountain Pasture are within four miles of active sage-grouse leks. In these areas, fence, reservoir, and spring development projects would not be constructed during sage-grouse breeding and early brood rearing periods, March 1 through June 30.

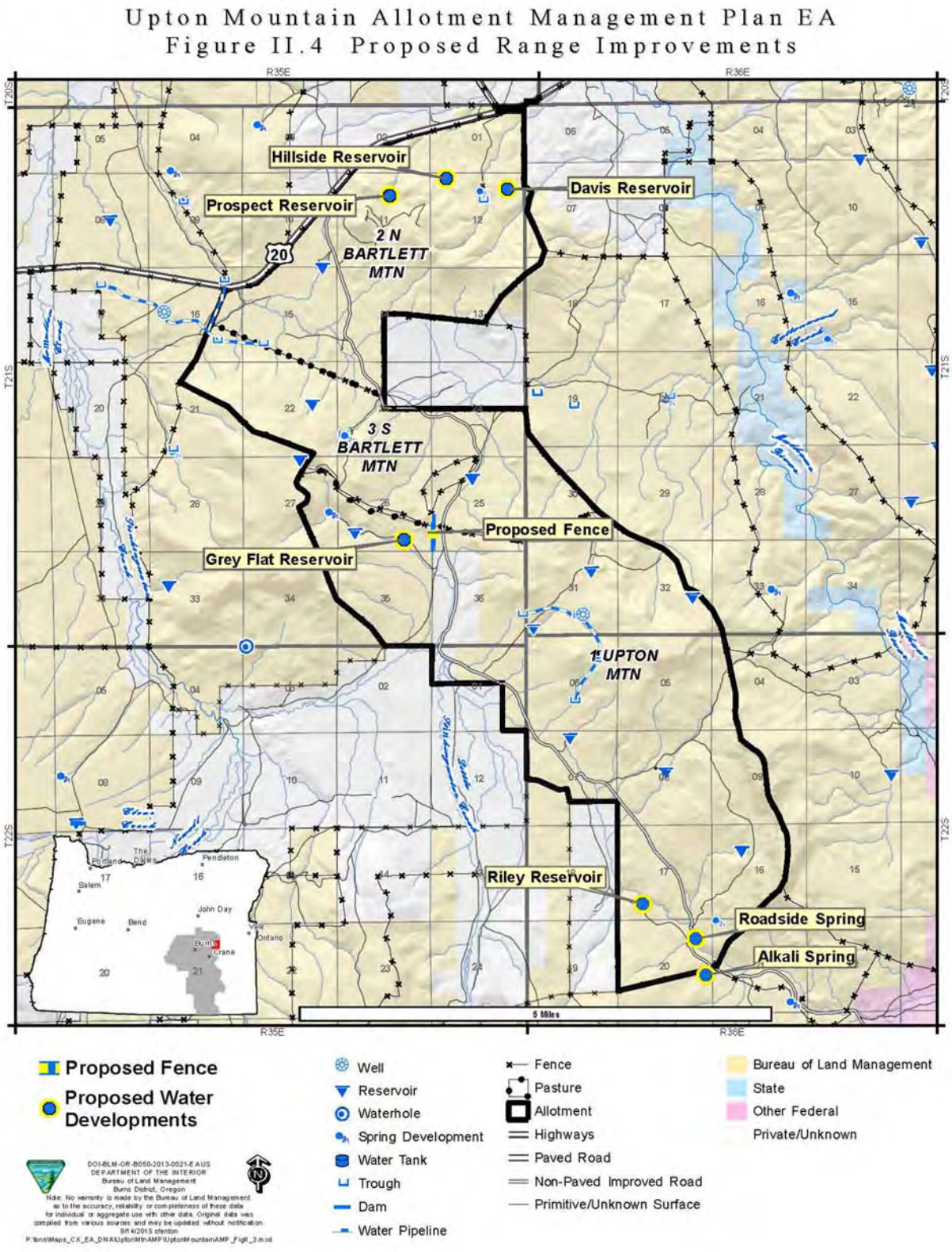
a. Fence

One fence measuring approximately 1/4 mile in length would be constructed using labor and motorized vehicles. It is estimated that the project would take one week to complete. This fence would be constructed in the Upton Mountain Pasture, connecting a fence on private land to an existing BLM fence. The fence would be located in Willamette Meridian, T. 21 S., R. 35 E., section 26. The fence would be a four-strand wire fence constructed to wildlife standards. It would have a smooth bottom wire 16 inches above the ground, with the next three wires being barbed and placed at 22 inches, 30 inches, and 42 inches above the ground. The fence would be marked with 3-inch plastic clips placed between T-posts (4 when T-posts <20 feet spacing, 5 when T-posts >20 feet spacing) to reduce potential sage-grouse strikes. The fence would be a letdown fence. It would be constructed to be laid down on the ground when it wasn't needed. The proposed fence would create a small pasture that would aid in livestock handling and management during fall/winter use. The fence would not create a new pasture, but would remain part of the Upton Mountain Pasture.

b. Reservoirs

Reservoirs would be designed based on site conditions; the dam would be 10 to 20 feet high, a minimum of 12 feet wide on top, and less than 150 feet in length. Slope on the upstream side would have a 2 to 1 ratio (2:1). Slope on the downstream side would be no greater than 3:1. Spillways would be no less than 25 feet wide and 100 to 150 feet in length, with a smooth bottom and a mild grade to prevent cutting due to erosion. Rip rap (6- to 10-inch rocks) may also be used to further prevent erosion. During construction, trees and shrubs would be removed from the dam site and flooded basin. The size of the disturbed area would depend on the size of the reservoir, but would be no more than two acres. All disturbed areas would be reseeded after construction. Access to the sites would be by

Figure II.4 Proposed Range Improvements



existing roads where available. The work would be done with one doz.er or excavator with one or two people. Each pond should take one week to complete. If no access road is available, cross-country travel would occur; no new roads would be constructed to access these developments. All equipment would be washed before entering and/or leaving the project site to reduce the chances of spreading medusahead rye or other invasive weeds.

(1) Riley Reservoir - This proposed reservoir would be located at Willamette Meridian, T. 22 S., R. 36 E., sec. 17, in the Upton Mountain Pasture of the allotment.

(2) Prospect Reservoir - This proposed reservoir would be located at Willamette Meridian, T. 21 S., R. 35 E., sec. 11, in the North Bartlett Mountain Pasture of the allotment.

(3) Hillside Reservoir - This proposed reservoir would be located at Willamette Meridian, T. 21 S., R. 35 E., sec. 12, in the North Bartlett Mountain Pasture of the allotment.

(4) Grey Flat Reservoir - This proposed reservoir would be located at Willamette Meridian, T. 21 S., R. 35 E., sec. 26, in the Upton Mountain Pasture of the allotment.

(5) Davis Reservoir - This proposed reservoir would be located at Willamette Meridian, T. 21 S., R. 35 E., sec. 12, in the North Bartlett Mountain Pasture of the allotment.

c. Spring Developments

Spring developments would consist of installing a spring box to gather water; spring boxes, typically 1½-foot diameter galvanized steel culvert and drain rock, would be installed using a backhoe and/or excavator and 2–3 people and would take 3 days to complete. A pipeline would carry water from the spring box to a trough. Length of the pipeline would be determined by topography, exclosure size, and trough placement. The riparian area around the spring source would be fenced. Depending on the water flow rate, more than one trough may be installed. Trough(s) would be plumbed using float valve(s) to hold water in the trough(s) when flow exceeds demand. An overflow pipe would be installed to protect the trough in the event the float valve fails. The overflow pipe would carry water back into the channel.

(1) Alkali Spring is an existing spring development that serves Upton Mountain in the Upton Mountain Pasture and the adjacent allotment, Texaco Basin. It needs to be reconstructed to better serve each allotment. At least one 3,000-gallon trough would be

installed in each allotment. The existing overflow pond and outlet would be reconstructed and the outlet would be fenced. Redevelopment would incorporate applicable project design elements (PDE) (see "Project Design Elements" later in this part). The footprint of this project, including spring exclosure, would be at most 5 acres. It's located at Willamette Meridian, T. 22 S., R. 36 E., sec. 20.

(2) Roadside Spring was once developed; however, it is old and needs full reconstruction. Redevelopment would incorporate applicable PDEs. This project would not have a trough. The water would be piped into a new 30-foot x 40-foot (or smaller) reservoir. The spillway from the reservoir would return overflow to the natural channel. The reservoir would be constructed as described in "Reservoirs." It is located at Willamette Meridian, T. 22 S., R. 36 E., sec. 20 in the Upton Mountain Pasture.

d. Herbicide Treatments

Noxious weeds in the allotment would be treated using 2,4-D, picloram, dicamba, glyphosate, Plateau (Imazapic), Telar XP (chlorsulfuron), Transline (clopyralid), and Oust (sulfometuron methyl) as analyzed in the Integrated Invasive Plant Management for the Burns District EA (DOI-BLM-OR-B000-2011-0041-EA)**,** Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States FEIS, June 2007 (USDI 2007), and Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS, July 2010 (BLM 2010a). Weed treatments will incorporate all pertinent standard operating procedures (SOPs) and mitigating measures from the Vegetation Treatments Using Herbicides on BLM Lands in Oregon ROD (BLM 2010b. Appendix 2, pages 457–467).

e. Seeding

Where perennial grass cover is less than one plant per square meter and herbicide treatments occur, the site may be reseeded by rangeland drill or broadcast seeding. The seed mixture would include natives and/or desirable non-natives that have been found to be competitive with invasive annual grasses. Species that could be used on the Upton Mountain Allotment include bluebunch wheatgrass, bottlebrush squirreltail, Sandberg bluegrass, big sagebrush, antelope bitterbrush, crested wheatgrass, and forage kochia. Selected seed mixes would be based on availability, cost, ecological sites, the threat from invasive annual grasses, and other site-specific conditions. Seed would be tested in compliance with BLM policy. Wyoming big sagebrush and other shrubs may also be planted using bare-root transplants or plugs. Sagebrush seeding or planting would occur where the invasive annual grasses do not dominate the understory. Where seedings/plantings are implemented, livestock would be managed to ensure success.

D. Common to All Action Alternatives - Project Design Elements

Implemented range improvement projects would include applicable PDEs from the following list. PDEs were developed to aid in meeting project goals and objectives. These features are nonexclusive and are subject to modification based on site-specific characteristics (e.g., topography and vegetation).

1. Proposed range improvement sites would be surveyed for cultural values prior to construction. Where cultural sites are found, their condition and National Register eligibility would be evaluated. If sites are determined to be 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 (SHPO), as necessary. Mitigation measures can include site avoidance, protective fencing, surface collection and mapping of artifacts, subsurface testing, and complete data recovery.

2. Proposed range improvement sites would be surveyed for special status plant species prior to implementation. Special status plant populations or individuals would be avoided.

3. Proposed range improvement sites would be surveyed for special status wildlife species prior to implementation. If special status wildlife species are found, mitigating measures will be implemented to remove or lessen the impact of the proposed range improvements. In most cases, this is achieved by avoiding the area.

4. New livestock facilities other than fences (troughs, reservoirs, corrals, handling facilities) would be constructed at least 1 km (0.6 mile) from known sage-grouse leks. Any new fences would be constructed at least 1.25 miles from any known sage-grouse leks. All of the above are efforts to avoid concentration of livestock near leks and to reduce avian predator perches and collision hazards to flying birds.

5. All proposed wire fences (i.e. spring exclosures) constructed within 2 miles of a lek or known seasonal use area would include anti-strike markers on the wires to reduce potential mortality from Greater Sage-Grouse striking the fence.

6. No project construction or major maintenance activities would occur April 1 through June 15 during Greater Sage-Grouse nesting. Annual fence maintenance could occur during this period.

7. Escape ramps and a mechanism such as a float or shut-off valve to control the flow of water would be installed in tanks and troughs.

8. Proposed range improvement sites would be surveyed for noxious or invasive weeds prior to construction. Weeds 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) or subsequent decisions.

9. 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 ground disturbing activities, and completing follow-up monitoring to prevent new noxious weed establishment. If noxious weeds are found, appropriate control treatments would be performed in conformance with the 1998 Burns District Noxious Weed Program Management EA/DR (OR-020-98-05) or subsequent decisions.

10. The grazing permittee would be responsible for all range improvement maintenance.

E. Alternative C: Change Season of Use and Activate Suspended AUMs

Under this alternative, livestock grazing management would be similar to Alternative B, but without additional AUMs for targeted grazing following the fall/winter-use period. Otherwise, livestock management during the spring- and fall/winter-use periods would be the same as in Alternative B. Total permitted AUMs would be 2,386 AUMs (current permitted use plus suspended AUMs). No use beyond the planned fall/winter use would be authorized to target invasive annual grasses and fine fuels. The season of use each year would be April 1 through May 31 and September 7 through December 15 with 450 cattle, as shown in Figure II.3.

All proposed range improvements described in the Proposed Action would be included in Alternative C. Monitoring would also be the same as in the Proposed Action.

F. Alternative D: Complete Removal of Livestock Grazing

This alternative would involve closing the allotment to livestock use and not issuing a grazing permit. No new range improvements would be constructed within the Upton Mountain Allotment unless needed for another resource. Existing range improvements would be maintained as needed for other resource uses. The existing pasture fences would be removed.

G. Alternatives Considered but Eliminated from Further Analysis

1. Conversion of Livestock Type and Removal of Fences

This alternative would change the authorized kind of livestock from cattle to domestic sheep. Sheep distribution, forage utilization, and timing of use would be managed by a herder(s) and the internal pasture fences would be removed. The water developments needed to facilitate sheep use of the allotment would be constructed. This alternative was eliminated from detailed analysis for the following reasons:

a. Demand for Domestic Sheep Grazing

The permittee operates a cattle ranch. Ranch infrastructure (e.g., handling facilities, hay production, and employees) is designed for cattle

production. Changing from cattle to sheep would require changing the ranch infrastructure. These changes would be expensive, making this alternative economically infeasible to the permittee. There is only one sheep producer in Harney County.

b. Dietary Preference

Generally speaking, cattle prefer grasses while sheep select the greenest forage (whether grasses, forbs, or shrubs). On Upton Mountain Allotment most of the vegetation is grass as a result of fires, fire rehabilitation, and invasive annual grasses. Cattle prefer the existing forage. During spring growth, sheep would select forbs. This could result in direct competition with sage-grouse, antelope, and mule deer for forbs and the associated insects. The vegetation and vegetation management issues on Upton Mountain Allotment are more suited to cattle use than sheep use.

c. Bighorn Sheep

Bighorn sheep occur along the Malheur River in the adjacent allotment within BLM's nine-mile buffer for domestic sheep in bighorn habitat. Interactions between wild and domestic sheep have proven to be detrimental to bighorn sheep populations. Studies have shown that even casual contact may lead to respiratory disease and fatal pneumonia in bighorns (Onderka and Wishart 1988, Schommer and Woolever 2001). In their disease overview, Schommer and Woolever (2001) concluded that contact between bighorn and domestic sheep increased risk of bighorn mortality. A complete range of causal agents that lead to these disease events cannot be conclusively proven at this point. Therefore, segregation of the two species is the best management practice at this time. Implementation of this alternative is remote due to these factors.

2. Herding

Herding has been suggested as a livestock management tool. A herding alternative would include herding cattle and removal of fences to achieve utilization and distribution objectives. While herding is a simple idea, much is needed to successfully implement cattle herding. On Upton Mountain Allotment, two to five riders would have to work the allotment every day. Due to the accessible and open terrain, groups of cattle would tend to disperse across the whole allotment, making the existing or proposed grazing system much more difficult to implement. Spring and fall grazing in the same year may be the most detrimental grazing treatment for the allotment's native perennial bunchgrasses (Reed, et al. 1999). Combining strategic supplement placement with herding has shown synergistic benefits (Bailey 2004). Monitoring of intensive herding management in Idaho found that the practice was successful when the herder was present every day. If the herder missed one day, the cows became unsettled and often refused to be herded (Butler 2000). It takes several years for the cattle to get used to changed management. Potential problems that may occur on Upton Mountain during this learning period include: 1) small groups of cattle getting separated from the main

bunches and ending up spending long periods of time near one spring; 2) finding cattle once they become separated from the herd; 3) attempting placement of cattle in areas where it is very difficult to get them to stay; and 4) figuring out the good and poor cattle locations. The learning process is stressful for the cattle and the people. It results in reduced livestock performance and can require additional labor until livestock become familiar with the herding process and what they are supposed to do. Upton Mountain has three fenced pastures. The existing pastures facilitate targeted grazing of invasive annual grasses because cattle use areas are restricted to the individual pastures. Trying to do something similar across the entire allotment with riders would be more difficult because individual groups of cattle would disperse across the whole allotment making it more difficult to focus grazing use on specific invasive annual grass infestations. In the current setting, there are not management, economic, or ecological benefits to livestock herding. For these reasons this alternative will not be analyzed further.

3. Water Hauling Rather than Development of New Drinking Water Sources

Targeted grazing of low quality forages partially depends on an ample and dependable supply of drinking water. It would be difficult and expensive to meet this requirement under optimum conditions of dry roads that accessed many areas where invasive annual grass control and fine fuels management were needed. On the Upton Mountain Allotment there is one maintained road that is impassable when wet, Warm Springs Road. During the fall/winter season of use and when it rains, impassible roads would preclude water hauling. In the current setting, water hauling is not a feasible substitute to development of dispersed, reliable watering locations. In summer, the permittee has hauled water to existing stock ponds and turnouts. For these reasons this alternative will not be analyzed further.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

A. Introduction

This chapter details the affected environment, which is the baseline resource data displaying current conditions of each identified resource with an issue (e.g., the physical, biological, and resources) that could be potentially affected by any of the alternatives discussed in Chapter II.

This chapter also contains the environmental effects which are the analytic basis for comparing the potential effects of enacting each of the alternatives detailed in Chapter II. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

Cumulative effects are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions (RFFA) regardless of what agency or person undertakes such actions. RFFAs 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. The 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 BLM. RFFAs do not include those actions that are highly speculative or indefinite. The RFFAs for this project are described below.

Agriculture, mainly ranching, will continue to be the dominant economic activity in the Drewsey area for the foreseeable future. As a result there will continue to be demand for grazing allotments on BLM lands on the Burns and Vale Districts and Malheur National Forest. Invasive annual grasses are a big problem in the Drewsey area. Burns District, private land owners, Harney County, and Oregon Department of Agriculture will continue noxious and invasive weed control efforts for the foreseeable future. This situation is expected to continue until there is better control of the invasive annual grasses. Hunting is popular in Harney County; antelope and chuckar are popular game species on the allotment. Use of Warm Springs Reservoir will continue to be erratic while the climate pattern of multi-year droughts intermixed with years of ample moisture continues. When Warm Springs Reservoir, an irrigation reservoir, is dry or almost dry it gets little recreational use. Wildfires are expected to be a continuing problem on the Burns District; however, they are unpredictable and unplanned, so suppression and rehabilitation are not RFFAs. The BLM would conduct wildfire suppression and emergency stabilization and rehabilitation (ES&R) on fires that did occur, based on prioritization and funding. Some resources may have additional RFFAs which will be identified in their sections of Chapter 3.

B. General Setting

Upton Mountain Allotment is part of a much larger area on the east side of the Burns District where medusahead rye and fire are becoming increasingly significant problems. In 2007, the Bartlett Mountain Fire burned all but 1,000 acres of the allotment. The total burned area was 32,300 acres of BLM land. Portions of this allotment have burned four times since 1996. As part of restoration activities, portions of this allotment have been seeded. Other areas were allowed to recover naturally. Despite restoration activities, medusahead rye and cheatgrass have become established and spread throughout the allotment. In some locations these invasive annual grasses have become the ecologically dominant species. In July 2014, the approximately 400,000-acre Buzzard Complex Fire burned about 1,565 acres in the South Bartlett and Upton Mountain Pastures. Some of this area was unburned before the Buzzard Complex and some had burned multiple times. One edge of the fire in the Upton Mountain Pasture stopped at a medusahead rye herbicide buffer strip along a two-track road in the fall/winter medusahead rye targeted grazing area. The fire stopped where the medusahead rye had received both targeted grazing the preceding winter and was sprayed with Plateau the preceding September. On the Burns District the Buzzard Complex burned large parts of the allotments that lie south of Upton Mountain. The 2014 Bartlett Mountain Fire, part of the Buzzard Complex, started in the traditional fire start area on the south end of Bartlett Mountain but remained small, in part because it went out on Upton Mountain Allotment. In comparison, the 2013 Olympus Fire (about 10 miles south of Upton Mountain Allotment) was rested from livestock grazing in 2014 for fire rehabilitation and completely reburned in the Buzzard Complex. Upton Mountain Allotment is illustrative of two issues. BLM spends a lot of money on fire suppression and rehabilitation. As part of fire rehabilitation and multiple-

use land management, BLM needs to incorporate actions that help protect the money spent on fire suppression and rehabilitation. In spite of the fires and invasive annual grasses, the entire Upton Mountain Allotment remains year-round sage-grouse habitat with active leks adjacent to the allotment. Most of the allotment is sage-grouse core habitat (Hagen et al. 2011) or PHMA (priority habitat management area) (Oregon sage-grouse RMP amendments, in press).

The most recent rangeland health assessment was conducted in 2004 (Figure III.1). The setting has changed since this assessment.

Figure III.1: Standards Assessment - Upton Mountain Allotment, 2004

Standard	Achieved	Not Achieved	Causal Factors	Comments
1. Watershed Function - Uplands		X	Fire	Not met due to direct and indirect results of large repeated fires; loss of sagebrush, proliferation of medusahead rye and cheatgrass, and seedings.
2. Watershed Function - Riparian/ Wetland Areas	X	X	Livestock	Bartlett #2 spring and an unnamed spring did not achieve standard, while Miler Spring did.
3. Ecological Processes		X	Fire	Due to fires/annual grass invasion, upland ecological processes are occurring at low successional stages. Ecological processes were met although Bartlett Mountain Spring is functioning at-risk.
4. Water Quality	N/A	N/A		Not applicable on a large portion of the allotment. No studies have been completed on existing springs. No determination has been made.
5. Native, Threatened and Endangered (T&E), and Locally Important Species	X	X	Fire, Invasive annual grasses	The standards were not achieved for the Malheur prince's plume (STCO2) or sage-grouse.

C. Identified Resource with Issue

The BLM Burns District IDT has reviewed and identified potential issues that may be caused by the alternatives through internal and external scoping. The Affected Environment table (Figure III.2) summarizes the results of that review. The resources with no issues identified and listed as either not affected or not present will not be discussed further in this document. Resources with an issue(s) have questions that will be analyzed in detail in this chapter are in **bold** in the table below.

Figure III.2: Affected Environment

Resource		**Status** **Affected** **Not Affected** **Not Present**	**If Not Affected, why?** **If Affected (BOLD), Reference Applicable EA Section.**
Vegetation		**Affected**	**See Chapter III Section C.1 (p. 26)**
Noxious Weeds (Executive Order 13112)		**Affected**	**See Chapter III Section C.2 (p. 42)**
Grazing Management and Rangeland		**Affected**	**See Chapter III Section C.3 (p. 52)**
Special Status Species (SSS) and Habitat	**Wildlife**	**Affected**	**See Chapter III Section C.4 (p. 62)**
	Plants	**Affected**	**See Chapter III Section C.9 (p. 89)**
	Fish	Not Present	There are no water sources that support fish in the allotment.
Threatened or Endangered (T&E) Species or Habitat	Wildlife	Not Present	There are no known T&E animals found in the allotment.
	Plants	Not Present	There are no known T&E plant species or designated critical habitat within the allotment.
	Fish	Not Affected	There are no known T&E fish found in the allotment. A small portion of the allotment is within the Griffin Creek - Upper Malheur Watershed (fifth field Hydrologic Unit Code (HUC)). This watershed is within Bull Trout critical habitat. However, the portion of the allotment within this watershed drains below critical habitat. Therefore, there would be no effect to

Resource	Status Affected Not Affected Not Present	If Not Affected, why? If Affected (BOLD), Reference Applicable EA Section.
		critical habitat.
Migratory Birds	**Affected**	**See Chapter III Section C.5 (p. 71)**
Wildlife/Locally Important Species and Habitat	**Affected**	**See Chapter III Section C.6 (p. 74)**
Soils and Biological Soil Crusts (BSC)	**Affected**	**See Chapter III Section C.7 (p. 79)**
Wetlands-Riparian Zones (Executive Order 11990)	**Affected**	**See Chapter III Section C.8 (p. 87)**
Water Quality (surface and ground)	**Affected**	**See Chapter III Section C.8 (p. 87)**
Fisheries	Not Present	There are no fish-bearing streams, lakes, or reservoirs in the allotment.
Cultural Resources	**Affected**	**See Chapter III Section C.10 (p. 95)**
Paleontological Resources	Not Affected	The area of ground disturbing actions will be surveyed prior to implementation. If paleontological resources are found they will be assessed and appropriately addressed.
American Indian Traditional Practices	Not Affected	Uses such as food and medicinal plant gathering, hunting, and possibly ceremonial/ritual practices could occur in the allotment. It is not likely any alternative would affect traditional practices beyond what may have occurred in the past.
Recreation/Off-Highway Vehicles (OHV)	Not Affected	The alternatives would not affect recreation, because livestock use of the project area has occurred for decades and people continue to camp and hunt on the allotment and go to Warm Springs Reservoir when it has water.

Resource	Status Affected Not Affected Not Present	If Not Affected, why? If Affected (BOLD), Reference Applicable EA Section.
		The alternatives do not address OHV use.
Visual Resources	Not Affected	The proposed project is within VRM Class IV. This class allows management activities that result in major modification of the landscape. The Proposed Action and alternatives would all meet this standard.
Social and Economic Values	**Affected**	**See Chapter III Section C.12 (p. 100)**
Environmental Justice (Executive Order 12898)	Not Affected	Implementation of the Proposed Action or any alternative would not have a disproportionately high or adverse effect on low income or minority populations as such populations do not exist within the project area.
Area of Critical Environmental Concern (ACEC)	Not Present	There are no ACECs or Research Natural Areas (RNA) within the proposed project area.
Air Quality (Clean Air Act)	Not Affected	The closest air quality monitoring location is in Drewsey, approximately 2.5 miles north of the allotment. Drewsey air quality monitoring has always achieved Oregon air quality standards.
Fire Management	Not Affected	While the alternatives do not affect fire management and indirect effects on fire management would be the results of changes to native vegetation and noxious weeds, the selected actions will be coordinated with the fire program and applicable information entered into the Wildland Fire Decision Support System (WFDSS).
Hazardous Materials or Solid Wastes	Not Present	No solid or hazardous waste would be created by implementation of any of the alternatives.
Floodplains (Executive Order 11988)	Not Present	Analyzed in the 1992 Three Rivers RMP and are not present in the project area.

Resource	Status Affected Not Affected Not Present	If Not Affected, why? If Affected (BOLD), Reference Applicable EA Section.
Wild and Scenic Rivers (WSR)	Not Present	There are no WSRs in the allotment.
Wilderness Characteristics	Not Affected	See Chapter 1 Section C.1
Wilderness/Wilderness Study Areas (WSA)	Not Present	There are no WSAs or wilderness in the allotment.
Forestry and Woodlands	Not Affected	Not present on the allotment.
Minerals	Not Affected	The alternatives do not affect any component of minerals management on the district.
Prime and Unique Farmlands	Not Affected	Not present on the allotment.
Realty and Lands	Not Affected	The alternatives do not affect any component of the district's realty or lands programs.
Wild Horse and Burro	Not Affected	The allotment does not include a Herd Management Area (HMA).

Elements of the human environment which may be affected by the Proposed Action or alternatives are analyzed below. The main issue in the project area is the existing condition of the vegetation, so vegetation and noxious weeds will be the first two topics. The primary treatments in the proposed AMP involve livestock grazing management. That will be the third issue. The other potential impacts are indirect effects of the alternatives on vegetation, so the next group of issues is wildlife species and habitat and sage-grouse habitat. The remaining issues follow with biological resources preceding social resources.

Livestock grazing on BLM lands requires a grazing permit. All alternatives authorizing livestock grazing would result in issuing a ten-year grazing permit which is the temporal scale of the direct and indirect effects analysis. The Upton Mountain Allotment is the project area and also the geographic extent of the direct, indirect, and cumulative effects analysis, unless specified otherwise under an issue.

1. Vegetation

a. Affected Environment

The analysis of potential effects to vegetation is tiered to the 1991 Three Rivers Preliminary Resource Management Plan (PRMP)/FEIS and relevant information contained in the following sections is incorporated by reference: Three Rivers - Chapter 2, p. 2-51 and Chapter 3, p. 3-7.

The needs for the Proposed Action arise from the condition of the vegetation on the allotment. This allotment is in a semi-arid environment, with eleven to thirteen inches of precipitation annually. Currently, invasive annual grasses are on the way to becoming the ecologically dominant plants as drivers of medusahead rye/cheatgrass fire cycle plant communities. As a result of successful fire rehabilitation and subsequent light grazing use, there is a lot of standing litter in perennial bunchgrasses. In the absence of heavy snows that knock the dead stems to the ground (e.g., in 2012, 2013, 2014, and 2015), standing litter increases the flammability of the bunchgrasses (Davies et al. 2015). Together the abundance of invasive annual grasses and standing litter in perennial bunchgrasses set the stage for another large fire. One goal of the Proposed Action is to address these problems. The potential direct effects of the alternatives would be to vegetation. Other potential impacts of the alternatives would be indirect effects of the potential impacts to vegetation (i.e., altered sage-grouse habitat values, potential for more large fires, and effects to livestock management options).

There have been 12 fires on the Upton Mountain Allotment since 1981, with the first big fire in 1996 (Figure III.3). Some areas in the South Bartlett Pasture have burned four times since 1996 (Figure III.3). The 2007 Bartlett Mountain Fire reburned all of the older burns. Each fire resulted in expansion of medusahead rye and cheatgrass, which are common to dominant across the allotment. Each successive fire increases their ecological impact by providing an abundance of nutrients that medusahead rye and cheatgrass are able to utilize as they germinate in the fall following the fire or earlier the next spring than most native species. Native perennial bunchgrasses cannot recover from repeated fires indefinitely. As a result, repeated burning helps medusahead rye and cheatgrass out-compete native vegetation. Only ten percent of the allotment remains unburned with low sagebrush and Wyoming big sagebrush plant communities. Ninety percent of the allotment has converted to grasslands composed mostly of perennial bunchgrasses and invasive annual grasses. In 2014, the Buzzard Complex burned 1,565 acres in the Upton Mountain Allotment. Parts of South Bartlett and Upton Mountain Pastures were burned, with a portion of one of the residual, intact sagebrush patches affected.

Figure III.3: Fires on the Upton Mountain Allotment

(GIS layers “Fires” and “Fire Points”)

YEAR	NAME	TOTAL ACRES	NOTES
2014	Buzzard	87,141	Part of Buzzard Complex
2014	Bartlett	3,975	Part of Buzzard Complex
2007	#7143	25	
2007	Bartlett Mountain	32,312	90% of Upton Mountain Allotment burned
2006	#2516	38	
2014	Motorhome	< 1	
2002	Warm Springs	68	
1998	Upton Mountain	< 1	
1996	Bartlett	1,871	
1994	Highway 20 Milepost 169	< 1	
1981	Cracker	< 1	
1981	Miler	7	
		125,441	TOTAL

Figure III.4: Upton Mountain Allotment, Shrub Canopy Cover, 2011

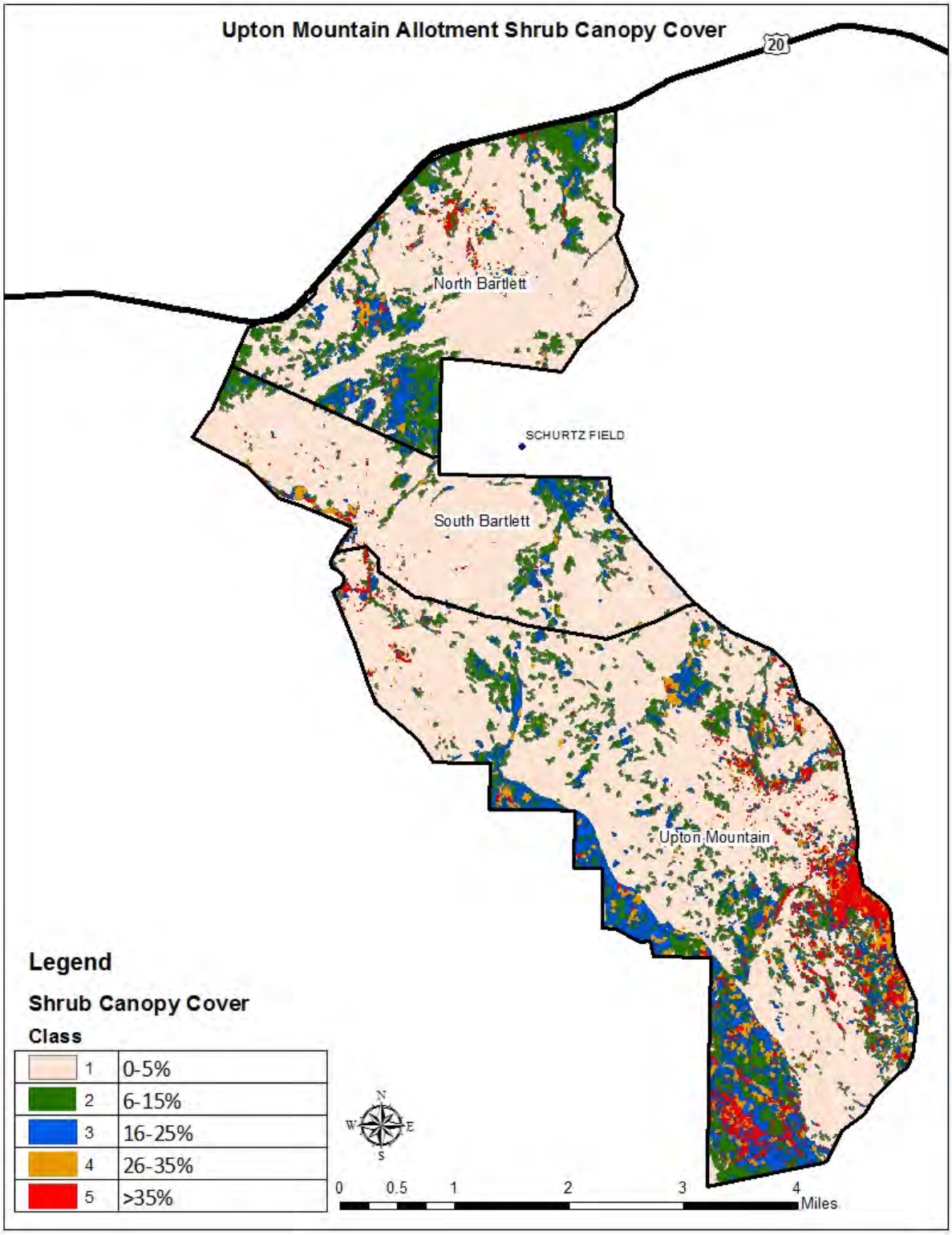
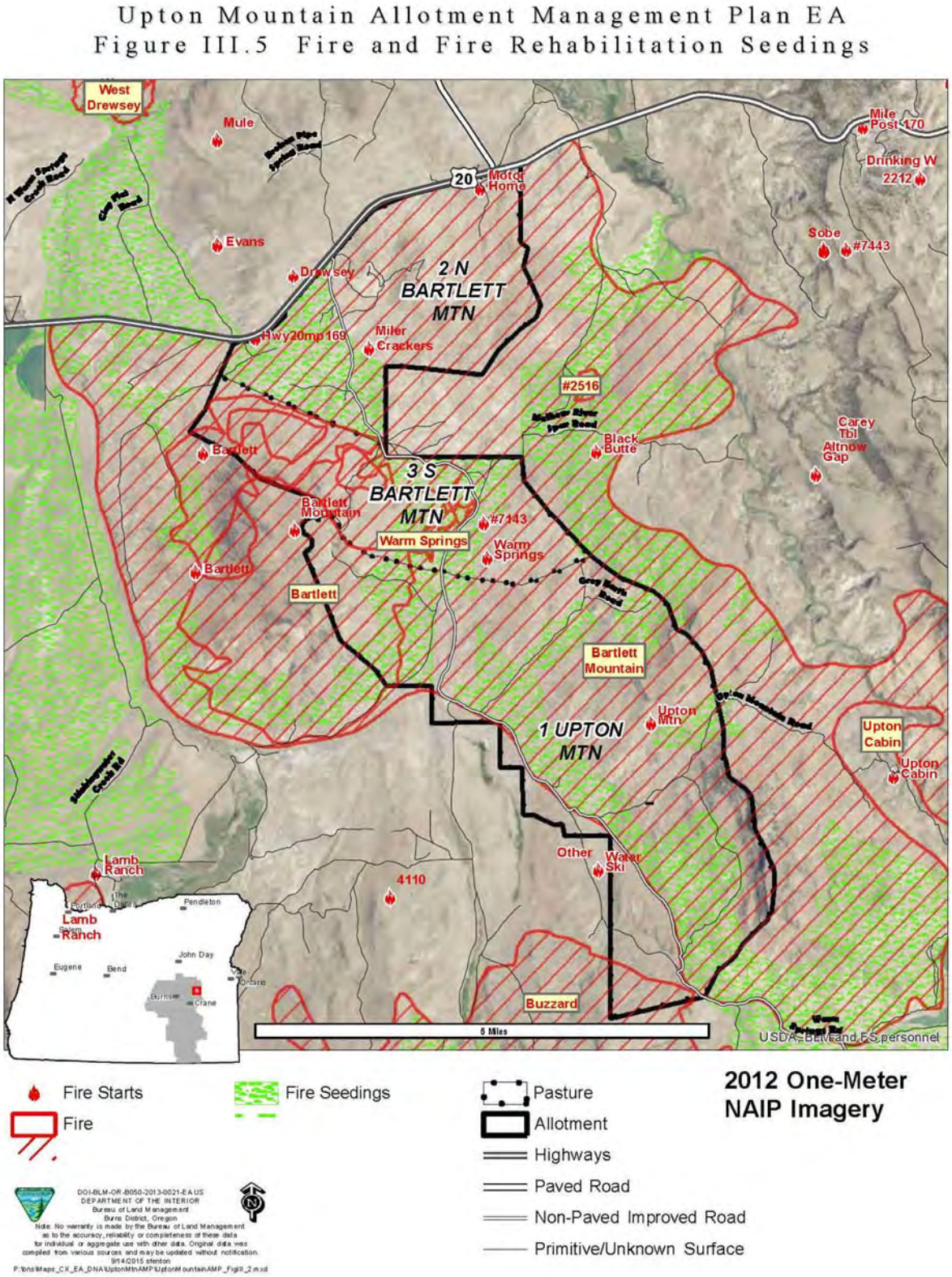


Figure III.5: Fire and Fire Rehabilitation Seedings



The Proposed Action would involve several ecological principles. Most importantly, the impacts of medusahead rye and cheatgrass will not decline within a management timeframe, or within the long term, without active management. Because the plant communities on the allotment have started down the successional path towards an invasive annual grass - fire community, active management is needed to change this successional trajectory. We cannot tell whether parts of the allotment have crossed a threshold to an invasive annual grass - fire community. The combination of invasive annual grasses and standing dead litter in the perennial bunchgrasses creates a fine fuels situation where there is a high potential for rapid fire spread and large fires. Reestablishment of open perennial plant interspaces eventually occupied by BSCs and increased ecological dominance by perennial bunchgrasses (replacing annual grasses) is a required step towards later successional native plant communities. The selected action needs to reduce the ecological impacts of medusahead rye / cheatgrass, reduce the chances of rapid fire spread and large fires, and maintain or change the successional trajectory towards perennial bunchgrasses and recovery of sagebrush steppe plant communities.

Rest from grazing will not improve the situation (Davies, et al. 2009). While our knowledge of pre-European vegetation management in the Great Basin is limited (McAdoo et al. 2013), we do know that the potential successional pathways have changed since the introduction of invasive annual grasses (e.g., Tausch et al. 1994 and NRCS ESD state and transition models 2001). There are a few examples of isolated, ungrazed, and unburned areas going from native plant communities to cheatgrass plant communities (Tausch et al. 1994). Active management includes noxious weed control, fuels management, seeding or planting native and desired species, burning, and other vegetation management actions. One cannot show examples of successional pathways from invasive annual grasses, medusahead rye and cheatgrass, to late successional native sagebrush steppe plant communities without active management.

In 2007, the Bartlett Mountain Fire burned all but about 1,000 acres in the allotment. Parts of the burn were reseeded with a mixture of desirable non-native and native bunchgrasses (crested wheatgrass (*Agropyron cristatum*) (AGCR), bluebunch wheatgrass (*Pseudoroegneria spicata*) (PSSP6), and Idaho fescue (*Festuca idahoensis*) (FEID) (EA # OR-07-025-071) (Figure III. 5). The current plant composition is dominated by crested wheatgrass, Sandberg bluegrass (*Poa secunda*) (POSE), bluebunch wheatgrass, and bottlebrush squirreltail (*Elymus elymoides*) (ELEL5), but also medusahead rye and cheatgrass (Upton Mountain trend plots 1, 2, 4, 7; 2009 monitoring). Unburned areas, scattered throughout the allotment (Figure III.4), have residual sagebrush steppe plant communities with low sagebrush (*Artemisia arbuscula*), Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) (ARTRW), Sandberg bluegrass, bluebunch wheatgrass, Thurber's needlegrass (*Achnatherum thurberianum)* (ACTH),

other native grasses, forbs, and medusahead rye and cheatgrass as common species (Upton Mountain trend plots 3, 5, 6, 8; 2009 monitoring). In 2014, the Buzzard Complex burned approximately 1,565 acres along the western edge of the Upton Mountain Pasture and the south west portion of South Bartlett Mountain Pasture.

The Upton Mountain Allotment permittee, in conjunction with the University of Nevada, Reno (UNR), is participating in a demonstration project studying fall/winter targeted grazing of medusahead rye and cheatgrass to reduce thatch and litter, cover, seed production, composition in the plant community, competition with desirable plants, and interruption of the annual grass fire cycle (Perryman and Stringham 2012). UNR has been testing this idea in central Nevada on cheatgrass since 2006 (Schmelzer and Perryman 2009 and Schmelzer, et al. 2014).

Despite the poor condition and early seral stages of the existing vegetation, sage-grouse continue to use the allotment year-round and antelope continue to use the general area in large numbers as transition and winter range.

b. Environmental Consequences - Vegetation

Effects Common to All Action Alternatives

One goal of an AMP is meeting the standards for rangeland health (BLM 1997). The standards that are not being met on the Upton Mountain Allotment are Standard 1, upland watershed function; Standard 3, ecological processes; and Standard 5, native and T&E species. These standards are not being met due to invasive annual grasses and wildfires. The vegetation condition goal on the Upton Mountain Allotment is to protect existing sagebrush and shrubs on the allotment, while addressing the problems of invasive annual grasses and frequent fires.

Alternative A: No Action

Under the No Action Alternative, the plant communities are on a successional trajectory towards an invasive annual grass fire cycle. The combination of the grazing schedule and light utilization levels have resulted in a buildup of flammable litter from medusahead rye/cheatgrass and perennial bunchgrasses. After each fire, the landscape cover of medusahead rye/cheatgrass increases.

Under the current grazing management, forage plants would continue to be grazed on two pastures post-seed production every year. The North Bartlett and Upton Mountain Pastures would be grazed during the critical growth period or post-seed set every other year. The invasive annual grasses would only be potentially grazed in the pasture with spring use while they were green and before they produced seed. For the rest of the growing season, invasive annual grasses would be ungrazed. The South

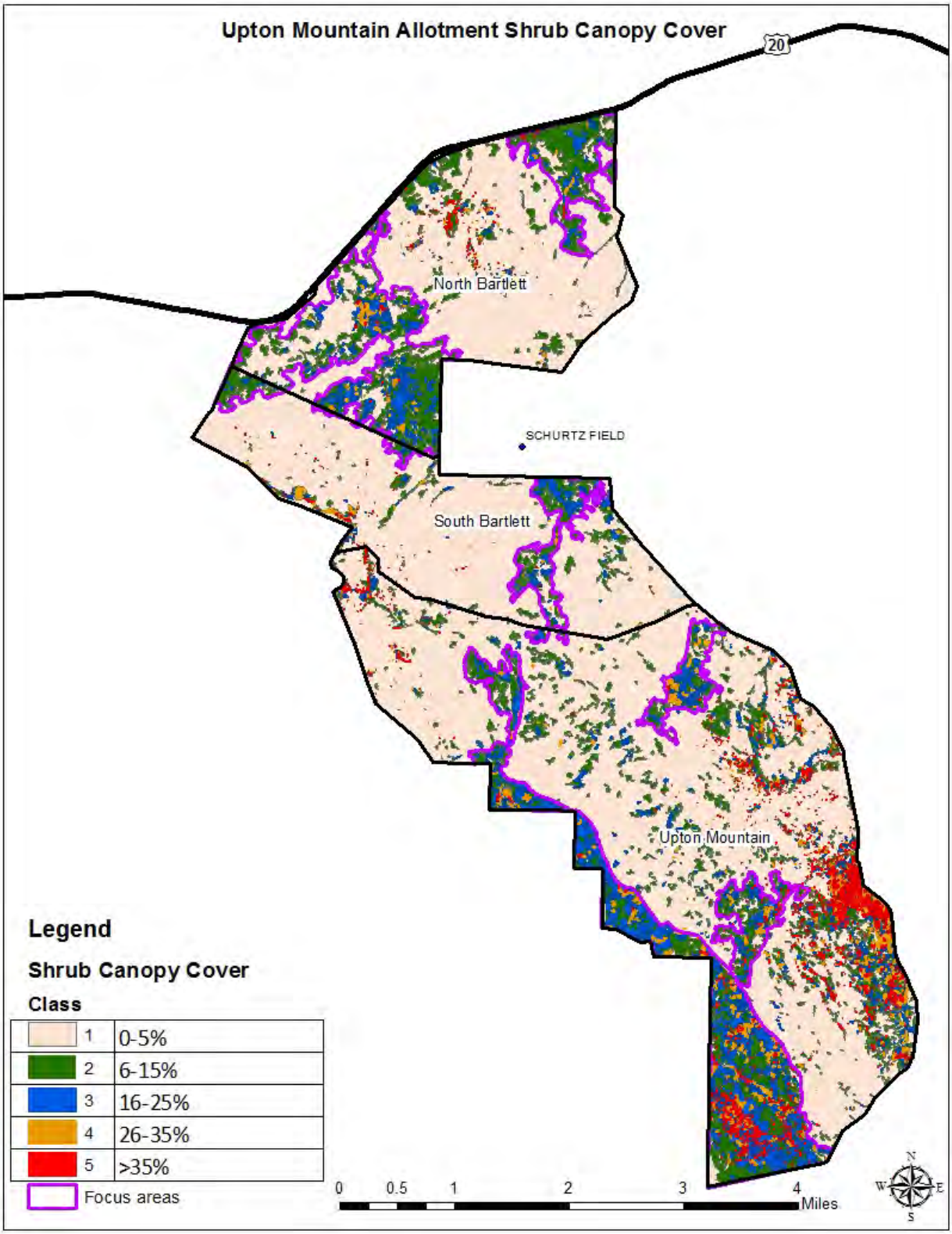
Bartlett Pasture would be grazed post-seed set every year. Under this management, the medusahead rye thatch layer and cheatgrass litter and standing dead litter would continue to increase and fill in the spaces between perennial bunchgrasses and forbs, creating a continuous fuel bed. medusahead rye seeds successfully germinate in medusahead rye thatch (Young 1992) while most other species' seeds, including the desirable perennial bunchgrasses, cannot.

As a result of light use on the perennial bunchgrasses, there are copious amounts of decadent material which is extremely flammable given the right weather conditions, such as those we have seen during fire season over the last four years. As more individual bunchgrasses consist of decadent material, production and vigor decline. Fuel moisture also declines (Davies et al. 2015). Absent some disturbance (e.g., heavy snow, fire, trampling, or herbivory), the dead material persists in the clump for several years resulting in the above ground part of the plant having more dead leaves than live. Unmanaged, this leads to the loss of perennial bunchgrasses from the community.

Currently on the Upton Mountain Allotment, interspaces are moderately to heavily occupied by invasive annual grasses. These conditions are especially bad in the South Bartlett Pasture, which has not been grazed in the spring leading to heavy infestations of medusahead rye and cheatgrass. Under the No Action Alternative, the only grazing use of invasive annual grasses would be in the spring-use pasture, resulting in an overall increasing abundance of invasive annual grasses.

The season of use under this alternative would result in livestock selecting for the native and seeded perennial bunchgrasses and avoiding the invasive annual grasses except in April and May when they would select both perennial and invasive annual grasses. Under the No Action Alternative, depending on weather, all the grasses are likely to be green and actively growing by May. In warm, wet years, active growth could begin earlier; in colder years it could be later. When all the grasses are green and actively growing, cows would graze plants that supply a mouthful, also resulting in selection of the larger perennial bunchgrasses over annuals, because the plants are larger. By mid- to late June, the annual grasses will have awned seeds and become unpalatable to livestock. Once cheatgrass turns purple, late May or June, it appears to be unpalatable to cattle. From early to late June until fall rain begins, annual grasses are unpalatable because they are dry with awned seedheads, their least palatable stage of growth. In contrast the perennial grasses are relatively palatable from spring until fall. Once fall rain begins, the annual grasses increase in palatability, because they are finer and absorb moisture faster than the courser perennial grasses. Additionally, cheatgrass can retain relatively high protein content into the fall (Schmeltzer and

Figure III.6: Upton Mountain Allotment Shrub Monitoring Focus Areas



Perryman 2009) contributing to its palatability. For most of the grazing season, under this alternative, cattle would avoid the invasive annual grasses and graze the perennial bunchgrasses, differentially stressing the desirable plants.

The No Action Alternative, in part, has resulted in the current seasons and levels of sage-grouse use. Most of the Upton Mountain Allotment burned in 2007 killing the sagebrush; however, an active sage-grouse lek remains in Shurtz Field (private land bordering the North and South Bartlett Pastures) which also completely burned in 2007 and was reseeded with crested wheatgrass. While searches for nesting sage-grouse have not been conducted in the Upton Mountain Allotment, they are seen throughout the allotment during the nesting season. If sage-grouse are nesting under sagebrush plants, they are nesting in the scattered unburned patches. Sage-grouse have also been found nesting under tall bunchgrasses (Hagen 2011). Such sage-grouse use would be expected to continue at least in the short term. Livestock use on the Upton Mountain Allotment would not be designed to alleviate the abundance of invasive annual grasses and increases in fine fuels. The primary threats to sage-grouse habitat in Upton Mountain Allotment are invasive annual grasses and the high risk of repeated fires. These threats are not addressed with the No Action Alternative.

Actions Common to Alternatives B (Proposed Action) and C

Alternatives B and C address the needs for the Proposed Action in several ways. The proposed grazing use in the North and South Bartlett Pastures would be the same under Alternatives B and C, April–May flip flop (Figure II.3). Under normal weather conditions, April grazing would be on dormant native perennial bunchgrasses, dormant or vegetative growth crested wheatgrass, and, in many years, spring growth on cheatgrass and maybe medusahead rye. During the April grazing season, new growth of medusahead rye/cheatgrass would be the most palatable forage present. Crested wheatgrass spring growth would also be very palatable. The dormant native perennial bunchgrasses would be comparatively unpalatable and largely ungrazed. In years with mild winters there would be vegetative medusahead rye/cheatgrass plants that had sprouted since fall; these would also be more palatable than the dormant native bunchgrasses. In the April-use pasture, grazing would focus on green invasive annual grasses and green crested wheatgrass. Because of the morphology of their mouths, cattle are not very selective grazers, and they would graze both dead and green crested wheatgrass leaves, reducing the amount of standing dead in grazed plants. Each medusahead rye/cheatgrass plant that is grazed during April is prevented from setting seed in June or July, reducing the amount of seed added to the soil seedbank. The growing season of the native perennial bunchgrasses would occur post-April grazing period. This means that following grazing use in

May, during the critical growth stage, the native bunchgrasses have 23 months before they are exposed to livestock again during their critical growth stage. Under proposed stocking and utilization levels and with normal weather, this is ample time for these plants to fully recover from grazing use and it sets the stage for successful seed set in favorable years. Seeds that fall in spots where a medusahead rye/cheatgrass plant was grazed off have the opportunity to establish. Through time this management would help change the successional trajectory towards perennial bunchgrasses (Smelzer et al. 2014) and eventually toward sagebrush steppe plant communities.

Under normal weather conditions, May grazing would be during the critical growth period of the native perennial bunchgrasses. medusahead rye/cheatgrass seeds would continue to germinate and grow. In the early years of implementation medusahead rye/cheatgrass would remain the most palatable forage during May because they do not have intermixed dormant leaves. As utilization on perennial bunchgrasses increases due to higher stocking levels and as the amount of standing dead in the bunches is reduced, palatability among the forage plants would equalize. Perennial May use of the native bunchgrasses would be detrimental and not address the needs of achieving Standards 1, 3, and 5; however, providing almost two years of growing season nonuse between use periods would allow grazed plants to fully recover, complete at least one annual cycle, and set seed between May-use periods. May utilization levels closer to 50% on perennial bunchgrasses would reduce the amount of standing dead, flammable material in the bunches. Each medusahead rye/cheatgrass that is grazed would be prevented from producing seed. In wet years, the grazed perennial bunchgrasses may be able to complete their annual life cycles post-grazing, but in most years summer drought would interrupt recovery of grazed plants. Grazed bunchgrasses would not be expected to produce viable seeds in the years they were grazed in May. The May season of use helps address both the amount of invasive annual grasses and standing dead material in perennial bunchgrasses.

Fall and winter use with protein supplementation (initially in the Upton Mountain Pasture) would result in preferential grazing use of the invasive annual grasses, but there are tradeoffs. The medusahead rye/cheatgrass that are grazed during the fall/winter grazing season have already set seed. By fall, all the grasses are less palatable than they were in the spring when they were green and actively growing. Once fall rains start, some of the perennial bunchgrasses may have a regrowth period. Seeds of invasive annual grasses will germinate and grow. This new growth is as palatable as spring growth. The amount of fall regrowth or germination varies with the weather and is thus undependable and not an important source of forage. Cheatgrass can be relatively nutritious during the fall and winter (Smelzer et al. 2014). This setting, with regrowth on the perennial grasses, new growth of invasive annual grasses, and increased forage moisture in

the dormant vegetation, creates a situation where the livestock will seek out the invasive annual grasses. The cattle will mix the very moist new growth annual grasses and the high fiber of mainly dormant perennial grasses (Provenza et al. 2009). Every medusahead rye/cheatgrass that is grazed during the fall is prevented from setting seed in the following summer. Freezing weather changes this setting, because photosynthesis and active plant growth stop. Now protein supplementation ensures cattle protein requirements are met and allows most of the diet to be low quality dormant forage. In other words, the cows will eat more dead grass, because the supplement supplies their protein requirement. The perennial grass component includes native bunchgrasses and crested wheatgrass. Grazing of dormant bunchgrasses has little effect on plant vigor. Grazing of bunchgrass fall regrowth would have little effect in the Upton Mountain Pasture because these plants were not grazed during the spring critical growth period. The proposed fall use of crested wheatgrass would decrease the amount of wolf plants because regrowth would be mixed with older stems or the whole plant would be dormant. Cows could not select just green crested wheatgrass leaves, because there would not be enough, and green leaves would be intermixed with dormant leaves. Annually grazing crested wheatgrass would eliminate wolf plant characteristics. Again, every medusahead rye/cheatgrass that is grazed during the winter is prevented from setting seed. In summary, the Proposed Action would favor native grass vigor and expansion by focusing grazing use on invasive annual grasses, reducing their competitiveness, and opening places in the plant community where new perennial plants could establish. It would also reduce standing litter in bunchgrasses and the number of wolfy crested wheatgrass plants.

The Proposed Action would help address the two main threats to sage-grouse habitat values in the Upton Mountain Pasture by focusing grazing on annual grasses and thereby reducing their impact and the risk of repeated large fires. The other potential effect of vegetation on sage-grouse habitat values in the Upton Mountain Pasture is its value as seasonal sage-grouse habitat. The Bartlett Mountain Fire killed most of the sagebrush on the allotment. As a result, winter and nesting habitat value would be expected to be poor. However, sage-grouse are observed on the allotment year-round.

In spring-use pastures, North and South Bartlett to start, the proposed season of use would result in cattle and sage-grouse using the pasture in April, early nesting season, and May, late nesting season and brood rearing. In cold years, the cows would be grazing the previous year's production in the April-use pasture. This forage would be course and dormant. Since all the perennial grass forage would be relatively unpalatable, the weather would be cool, and water would be present across the pasture, livestock would be well distributed and utilization would tend to be relatively even and/or focused on medusahead rye/cheatgrass. A

study on the Burns District (France, et al. 2008) found that when utilization was under 40%, livestock grazed in the shrub interspaces and were not grazing grasses under the shrubs. With around 35% utilization, common utilization levels during the winter grazing trials, livestock were not grazing the nest screening grasses at nest shrubs. In the April-use pasture this means that livestock would not be concentrating in specific areas and use in the scattered sagebrush patches would be slight because there would be little to attract the cows. If sage-grouse are nesting under tall bunchgrasses (Hagen 2011) the chances of a cow disturbing a nest would also be small, because tall bunchgrasses would be courser than annual grasses or smaller bunchgrasses. For these reasons, the potential for a cow to disturb a sage-grouse nest would be small. Post-grazing, the forage plants in the April pasture would have all or most of the growing season to regrow and complete their annual life cycles, maintaining vigor and productivity and providing ample nest screening cover in the next sage-grouse nesting season.

The situation would be similar in the pasture grazed in May. Except by May, most sage-grouse clutches would have hatched. The chicks would be mobile, so nest disturbance would no longer be an issue. Post-grazing, some regrowth would occur in normal and wet years, but in many years summer drought would interrupt regrowth. The result could be shorter plants the following spring and less seed production.

In the Upton Mountain Pasture, under Alternatives B and C, grazing would be post-active growth - fall/winter. This means that the stubble left following grazing would be the amount of stubble available for nest concealment in the next sage-grouse nesting season. Because fall use in the Upton Mountain Pasture is designed to focus livestock grazing on annual grasses and based on current and proposed utilization levels and the fact that most of the pasture burned in the Bartlett Mountain Fire, the potential impacts of grazing on nesting cover would be expected to be small but heavier adjacent to patches of medusahead rye and cheatgrass targeted for grazing.

Treating medusahead rye/cheatgrass infestations with Plateau would reduce the invasive annual grasses and allow existing perennial plants and seeded areas the opportunity to compete for resources such as space, water, and nitrogen and other nutrients, and to spread to sites once occupied by the invasive annual grasses. At the proposed rate, 6 oz./acre, Plateau is selective for annual grasses and usually does not harm established perennial plants. On the Upton Mountain Allotment there is little risk from treatment of native annuals because invasive annual grasses are pervasive and have generally replaced them.

Imazapic: Treating with Plateau in the fall (August and September) would have moderate risk to no risk to the health of upland vegetation (National

Vegetation FEIS, pages 4-49 and 4-53). Applications of 6 oz./acre (0.178125 pounds/acre of active ingredient Imazapic) would be below the maximum rate of 0.1875 pounds/acre analyzed by the Oregon Vegetation FEIS (CH 3, p. 60) and National Vegetation FEIS (Appendix C-9) authorized to treat infested sites (Oregon Vegetation FEIS C-9). Risk to the health of terrestrial and special status plants at this application rate and season from direct spray would be moderate, offsite drift would present low risk (special status spp.) and no risk (terrestrial), surface runoff would present no risk, and wind erosion would present no risk. It has been observed that fall applications with 6 oz./acre of Plateau would further reduce the risk on non-target plant species from direct spray from moderate to low because these plants are dormant (Davies 2010; Davies and Sheley 2011). Plateau would reduce medusahead rye and allow existing perennial plants and seeded areas the opportunity to compete for resources such as water, nitrogen, and other nutrients and to reestablish sites once occupied by medusahead rye/cheatgrass.

Medusahead rye would only be spot sprayed with herbicides in Malheur prince's plume sites when it directly threatened existing populations. Because Imazapic would be used at 6 oz./acre in the fall after Malheur prince's plume plants had withered, risk to existing plants would be slight. Generally, extant populations would not be treated with herbicides.

Treating noxious weeds with herbicides would benefit upland vegetation within the CEAA by promoting and maintaining native and desired introduced perennial vegetation. Proposed herbicides and their impacts to vegetation are described in the next section "Noxious Weeds."

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

The differences between Alternatives B and C are in the fall/winter-use period. Alternative B would allow for grazing use above permitted use for the purpose of targeted grazing of medusahead rye and cheatgrass. The annual limit to livestock use would be based on the amount of available medusahead rye/cheatgrass forage. It would allow protein supplementation to increase grazing use of dormant forages. A study in Nevada (Smeltzer and Perryman 2009) found that winter grazing on dormant cheatgrass with protein supplementation resulted in cows focusing their use on cheatgrass. They ate 80% of the available cheatgrass. The annual production of cheatgrass declined while the annual production of perennial grasses increased. The UNR demonstration project to test this concept in other locations began on the Upton Mountain Allotment in fall 2012. In 2012, the cows sought out medusahead rye and cheatgrass until temperatures dropped below zero. When they quit eating the target species, cows were removed from the allotment. In 2013, cows focused on medusahead rye/ cheatgrass until there was not enough left for them to graze, at which time they switched to perennial bunchgrasses. Post-grazing monitoring found

30% utilization on perennial bunchgrasses for the 2013 fall/winter season of use. In 2012 and 2013, cows were off the Upton Mountain Pasture by January 2 and the total AUMs used in the pasture were 1,712 in 2012 and 1,312 in 2013.

Livestock would be removed from the pasture when they stopped eating invasive annual grasses. This could happen for several reasons. The best reason would be they ate all the available medusahead rye/cheatgrass. They may also stop eating medusahead rye/cheatgrass due to prolonged cold weather. If snow covered the target forages, cattle would be removed from the allotment. The safeguards against over-use of perennial bunchgrasses in the fall/winter use pasture are: they are dormant and are not being grazed during their critical growth stage and a there is a 50% utilization target on native perennial bunchgrasses.

From vegetation composition and ecology perspectives, Alternative B best addresses all the needs for the Proposed Action in the fall/winter-use pasture. In their second year in the grazing trial on Upton Mountain Pasture, the cows appeared to have learned to maximize use of the invasive annual grasses. Additionally, it rained in the fall of 2013 so the invasive annuals were green until they froze. Photos comparing medusahead rye before grazing in 2012 and post-grazing in 2013 are dramatic (see below).

Each medusahead rye/cheatgrass that is grazed creates an opening in the plant community where a perennial bunchgrass or other native plant seed could germinate and establish. The fall/winter grazing also removes or tramples the medusahead rye thatch layer, reducing the advantage it gives medusahead rye seed in the next spring. During the fall/winter grazing period, the perennial bunchgrasses are dormant. As a result, cows are less selective against standing dead material in the plants and tend to graze the whole bunch. Protein supplement allows the cows to eat more low quality forage. Forage analysis found that during the winter cheatgrass was surprisingly high quality forage with protein levels above 4% (Smeltzer et al. 2014). Comparable analysis of medusahead rye protein content has not been done.

Under Alternative B, medusahead rye/cheatgrass thatch, litter, and dead plants would be reduced prior to the next fire season. Fall/winter grazing opens sites where desirable plant seeds could establish under favorable conditions. Through time, the successional trajectory of the plant communities moves towards desirable perennial plants and eventually sagebrush steppe. Grazing on dormant perennial bunchgrasses appears to be benign at utilization levels of 50% and lighter. Fall/winter grazing allows perennial forage species to complete their annual life cycles every year in the absence of livestock use. Fall/winter grazing favors the native perennial bunchgrasses as well as crested wheatgrass. Fall/winter use

reduces the amount of standing dead material in perennial grass bunches thus reducing fine fuels (Davies et al. 2015). Finally, removing invasive annual grass thatch and litter from between perennial plants and increasing perennial bunchgrass fuel moisture reduces the chances of another large fire. Decreasing the fuel load through grazing decreases the flame length and intensity of fires (Diamond, Call, and Devoe 2009). Long fire return intervals are needed for burned parts of the Upton Mountain Allotment to again become sagebrush steppe.

Alternative C: Change Season of Use and Activate Suspended AUMs

Under Alternative C the fall/winter grazing use would be 450 cows from September 7 to December 15 for 1,479 AUMs. Protein supplementation would be authorized to target grazing on medusahead rye/cheatgrass. The effects of this use would be similar to but slower and less effective than Alternative B because the limit to grazing use would be based on 1,479 AUMs rather than the amount of medusahead rye/cheatgrass removed. At least in the short term, more of these weeds would be left at the end of the grazing season than under Alternative B. As a result, in years with good production, medusahead rye/cheatgrass litter in the perennial plant interspaces could still carry fire resulting in larger fires than under Alternative B. Additional burning would be expected to result in increased area of infestation and cover of medusahead rye/cheatgrass, at least in the short term. If the fire return interval remained short, the successional trajectory towards invasive annual grass fire cycle would continue and the chances for recovery of sagebrush steppe plant communities would be less than in Alternative B. The more medusahead rye/cheatgrass that remain in the perennial plant interspaces, the fewer locations would be available for establishment of native perennial species seeds in favorable periods. If the invasive annual grass fire cycle is not broken, recovery of sagebrush steppe will not occur.

Alternative D: Complete Removal of Livestock Grazing

To summarize, the No Grazing Alternative does not address any of the vegetation concerns on the Upton Mountain Allotment. There are no studies that show passive management results in succession from medusahead rye/cheatgrass plant communities to late seral sagebrush steppe. On the other hand, there are many examples of establishment of an annual grass fire cycle in drier sagebrush plant communities. This concern was reflected in the Oregon sage-grouse strategy which identified invasive annual grasses and changed fire regimes as two of the three main threats to sage-grouse in the Burns District (Hagen 2011).

No grazing also does not address the buildup of intra-bunch litter in native bunchgrasses and crested wheatgrass. In the absence of medusahead rye/cheatgrass (which is not the case in the project area) an increasing amount of dead and dormant leaf material in the bunches would just lead

to reduced productivity and eventually plant death. In combination with ample production of invasive annual grass litter it also increases fine fuel levels and the chances for another large fire. In the project area, perennial bunchgrasses that die would be replaced with medusahead rye/cheatgrass.

Noxious weed control would continue on the Burns District under Alternative D. Photo monitoring shows that targeted grazing plus Plateau treatment complement each other in controlling invasive annual grasses. While passive management of plant community succession, i.e., no livestock grazing, at one time may have lead to late seral plant communities, this is no longer the case in lower, dryer sagebrush plant communities in the northern Great Basin. With the advent of invasive annual grasses in Wyoming big sagebrush and other drier sagebrush plant communities, this has changed. Invasive annual grasses need to be managed to prevent their dominance of the plant community in the form of the annual grass fire cycle. Successful control of invasive annual grasses has proven very difficult. There are no studies or monitoring showing succession from invasive annual grasses to late seral sagebrush steppe in drier sagebrush communities absent management intervention. One tool for managing invasive annual grasses can be targeted grazing. The No Grazing Alternative would eliminate this tool.

Figure III.7

Cumulative Impacts

The cumulative effects analysis area (CEAA) for vegetation is the allotment boundary, because it is the only logical choice. Other possible CEAAs, 1 mile buffer, 10 mile buffer, fifth field HUC, or the perimeter of the 2007 Bartlett Mountain Fire or of the 2014 Buzzard Complex, introduce many variables not related to management of the Upton Mountain Allotment and so were not chosen. The CEAA time frame is ten years, the length of a new grazing permit.

Burns District plans to reintroduce sagebrush into the Upton Mountain Allotment. In the current setting seeded sagebrush could not compete with invasive annual grass seeds. Planted plugs or root stock material would be burned in the next fire. Reintroduction of sagebrush is planned when the invasive annual grasses are better controlled or more isolated. It is not known when this will occur.

On the Burns District, medusahead rye and fires are a growing problem. Recent fires sites in the Steens and along the south face of the Blue Mountains all have medusahead rye infestations. Large areas of the Stinkingwater Mountains have medusahead rye, with or without fires. The issue of medusahead rye and fire exists on other BLM districts across the northern Great Basin. Much of the area of the 400,000-acre Buzzard Complex on the Burns and Vale Districts in 2014 had medusahead rye as a component of the plant community. The 2013 Olympus Fire which came back to Medusahead reburned in the Buzzard Complex. Livestock grazing is the most common land use on BLM lands in the northern Great Basin. Implementation of effective ways to manage this most common use to help address this growing problem would be efficient multiple-use management.

The selected alternative would occur in conjunction with the Burns District's noxious weed control program (which includes medusahead rye) using herbicides. Burns District began using Imazapic to treat medusahead rye in 2012. Some adjacent private land owners have been treating their lands with Imazapic for a number of years. Private land treatments would be expected to continue for at least the short term.

2. Noxious Weeds

a. Affected Environment

While medusahead rye was an important component of the preceding section, Upton Mountain has additional noxious weeds. They are better controlled and their impacts are less than those of medusahead rye. The Burns District BLM database currently lists 372 noxious weed sites totaling approximately 2,316 acres in the Upton Mountain Allotment. There have been 11 different noxious weed species documented in the

allotment. The numbers and acreages associated with each are displayed in Figure III.8 below.

Figure III.8: Noxious Weed Inventory

Noxious Weed Species	**Number of Sites**	**Acres**
Canada thistle (*Cirsium arvense*)	14	0.600
Bull thistle (*Cirsium vulgare*)	7	2.000
Scotch thistle *(Onopordum acanthium)*	124	77.000
Field Bindweed (*Convolvulus arvensis)*	1	0.100
Halogeton (*Halogeton glomeratus*)	5	7.000
Black Henbane (*Hyoscymus niger*)	8	0.050
Perennial pepperweed (*Lepidium latifolium*)	1	0.003
Dalmatian toadflax (*Linaria dalmatica*)	3	0.010
Mediterranean sage (*Salvia aethiopis*)	7	0.060
Whitetop *(Cardaria draba)*	35	18.000
Medusahead rye (*Taeniatherum caput-medusae*) (TACA)	167	2,211.000
Totals	***372***	***~2,316.000***

Approximately 85% of the Upton Mountain Allotment has been systematically surveyed for noxious weeds in conjunction with wildfires, treatments, and monitoring for projects. The roads have been inventoried. Once a weed site is identified it stays in the database regardless of treatment effects. This is to ensure the site is periodically monitored to ensure controlled noxious weeds don't reestablish.

Most of the weed infestations except for medusahead rye have been treated. In the past, medusahead rye was treated with glyphosate along roads to minimize opportunities for spread. In 2012, aerial medusahead rye treatments using Plateau (*Imazapic*) were initiated in various locations on the district, including 630 acres in the Upton Mountain Allotment. Effectiveness of those treatments was evaluated in the spring of 2013 and results were positive, indicating greater than 95% control. Additional

medusahead rye treatments using Plateau occurred in the fall of 2013 including 1,270 acres in the Upton Mountain Allotment. Post-treatment monitoring occurred in the spring/summer of 2014. Under ideal conditions, Plateau treatments can control medusahead rye for two years. Monitoring in 2014 of the 2012 treatments on the Upton Mountain Allotment found this was the case in some areas, but not in others. Coincidentally, the weather in 2014 resulted in exceptional grass growth. Monitoring in 2015 of the winter medusahead rye grazing trial found that road buffers created with Plateau in 2012 continued to hold. Most other weed infestations are monitored annually and retreated as needed. Treatments in the Upton Mountain Allotment are displayed in Figure III.9 below.

Figure III.9: WEED TREATMENTS

Year	Species	Acres Treated	Project Acres
2013	Medusahead Rye (TACA) Canada, Scotch and Bull Thistles; Whitetop, medsage, Henbane	1,270 27 **TOTAL- 1,297**	1,471 52,400 **TOTAL- 53,871**
2012	Medusahead Rye (TACA) Canada, Scotch and Bull Thistles; Whitetop, medsage, Henbane	630 1.8 **TOTAL 631.8**	630 50,330 **TOTAL- 50,960**
2011	Canada, Scotch and Bull Thistles; Whitetop, medsage, Henbane	4.64 **TOTAL- 4.64**	78,840 **TOTAL- 78,840**

Year	Species	Acres Treated	Project Acres
2010	Medusahead Rye (TACA) Canada, Scotch and Bull Thistles Diffuse Knapweed	4 1.24 2.2 **TOTAL-7.44**	100 250 2,522 **TOTAL- 2,872**
2009	Diffuse Knapweed Medusahead Rye (TACA)	0.12 2.8 **TOTAL- 2.92**	2,522 50 **TOTAL-2,572**
2008	Diffuse Knapweed	0.8 **TOTAL- 0.8**	2,522 **TOTAL- 2,522**
2006	Diffuse Knapweed	0.16 **TOTAL- 0.16**	2,522 **TOTAL- 2,522**
2005	Perennial Pepperweed	0.3 **TOTAL- 0.3**	80 **TOTAL- 80**

The most difficult weed control problem in the allotment is the medusahead rye. Acreage estimates for medusahead rye from our database (2,211 acres) are well under actual infested acres, because the medusahead rye infestations have not been systematically mapped. Attempts to aerially map medusahead rye in 2012 and 2013 were not successful due to weather. Medusahead rye has been increasing in the allotment's uplands for many years. In some areas it is replacing the native bunchgrasses.

In areas with heavy clay soils, medusahead rye out competes cheatgrass and mid- and late seral species, as well as competitive introduced species such as crested wheatgrass (Pyke 1999). However, management that produces functional mid- to late seral vegetation (in good to excellent condition) that occupies the available niches slows the movement of medusahead rye. Grazing management that favors perennial bunchgrasses and stresses the invasive annual grasses contributes to the plant community's resistance to noxious weed invasion and expansion and reduces the size of future wildfires.

Burning areas with medusahead rye favors medusahead rye (Young 1992). Fire exacerbates the problem by creating unoccupied niches where medusahead rye can invade and expand. For one (and maybe two) years post-burn, fire can stimulate desirable grasses and forbs and reduce medusahead rye. However, if the burn is not quickly followed (preferably the same year) by effective weed management activities such as seeding, targeted grazing, and/or herbicide treatment, any gain would soon be overwhelmed by medusahead rye capitalizing on open niches and newly released nutrients. The 2007 Bartlett Mountain Fire burned across most of the Upton Mountain Allotment. It did release many of the native grasses and areas that were seeded responded well. The fire initially set back the medusahead rye, but large scale herbicide treatments could not start until 2012 due to a court injunction that prevented the use of Imazapic (and all but four other herbicides). By 2012, medusahead rye was again well established across the allotment and any control advantage offered by the 2007 fire had been lost. Oregon BLM is beginning to use Imazapic, one of the herbicides analyzed in the 2007 National Vegetation Management EIS and the 2010 Oregon EIS. The Upton Mountain Allotment is a high priority area to treat medusahead rye because of the tremendous investment we have in rehabilitation following the 2007 wildfire, and because perennial bunchgrasses that can respond positively to these treatments still occur across the allotment.

The potential impacts from noxious and invasive weeds and noxious and invasive weed control to other resources and resource values are direct and indirect effects occurring in treatment areas or infestations on the Upton Mountain Allotment. No additional cumulative impacts from noxious and invasive weeds or treatments were identified.

b. Environmental Consequences

Actions Common to All Alternatives

Herbicide treatment of noxious and invasive weeds would continue with appropriate, authorized herbicides in compliance with standard operating procedures and mitigation measures (Appendix B), label directions, and BLM policies. Treatment acreages are difficult to predict, because noxious weeds spread and additional infestations and species could be found.

Another large fire on the allotment would further degrade the situation. Decision drivers for herbicides and rates are listed in Appendix B. Weed spraying is expensive and funding varies widely from year to year. That being said, treatment acres for the documented noxious weed species in any year during the term of the proposed grazing permit would be expected to be similar to "Acres Treated" in Figure III.9. for all species except medusahead rye. Medusahead rye herbicide treatment area would be less than 14,162 acres. To date the largest application of Plateau on medusahead rye in one year was 1,270 acres in 2013.

Alternative A: No Action

Selection of the No Action Alternative would continue the management which created decadent, wolfy perennial bunchgrasses with interspaces occupied by medusahead rye and cheatgrass. As discussed in the "Vegetation" section, the existing plant communities have lowered resistance to noxious and invasive weed introduction and spread (especially to medusahead rye/cheatgrass) and are more susceptible to wildfire. The Upton Mountain Allotment is already at risk for noxious weed spread because of the level of infestation currently present.

The 2007 Bartlett Mountain Fire ES&R EA analyzed the treatment of medusahead rye with Imazapic, but that alternative was not selected because Imazapic was not available for use on Oregon BLM lands. In 2012, following the 2010 Oregon EIS and modification of the injunction, Burns District revisited the 2007 decision using the DOI-BLM-OR-B050-2012-0029-DNA. Alternative B in the 2007 ES&R EA, treatment of medusahead rye with Imazapic (along with other treatments), was selected and treatments were started in 2012 in accordance with the Bartlett Mountain Fire ES&R EA. Additional treatments on medusahead rye in subsequent years are planned.

Under the existing Burns District Noxious Weed Management Program EA, the Burns District generally is not authorized to use the most effective or selective herbicides to treat noxious weeds that were analyzed in the 2010 Oregon Vegetation FEIS. Site specific NEPA analysis, including the Bartlett Mountain Fire ES&R EA and this EA, is required to use herbicides authorized in the 2010 EIS. Under the No Action Alternative, weed treatments would continue with the currently authorized herbicides (which are less effective, less selective, and more detrimental to non-target, desirable vegetation) as well as with Imazapic.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

Proposed changes in grazing management would lead to an upward trend in upland plant community condition. Annual, or every other year, growing season rest from livestock grazing combined with targeted grazing of noxious weeds and invasive annual grasses would help increase

or maintain functioning, vigorous, occupied perennial plant communities resistant to noxious weed introduction and spread. Range improvement projects designed to increase the amount of low quality forages eaten (especially dormant invasive annual grasses), moderate livestock congregation, and improved animal distribution across the landscape would reduce the level of disturbance and, therefore, reduce opportunities for noxious weed introduction and spread.

Ground-disturbing activities associated with proposed range improvement construction create opportunities for noxious weed establishment and spread. The proposed fence and water developments are activities that could open up niches for weed invasion. 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. 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.

Herbicide Application: When determined to be the most appropriate treatment for noxious weeds, use of herbicides would be in conformance with label instructions. Herbicide treatments would overlap targeted grazing areas. Only treatments allowable on Oregon BLM lands in conformance with standard operating procedures and mitigation measures would be used (Appendix B). Herbicides would be applied aerially or using ground-based sprayers. The Burns District Noxious Weed Management Program ROD (1998) (EA-OR-020-98-05) authorized the use of four herbicides: picloram, dicamba, glyphosate, and 2,4-D. Appendix B identifies the target noxious weeds, phenological stages when treatment is most effective, application rates, and tank mixes for the noxious weeds found on the Upton Mountain Allotment.

Herbicides, in addition to the four authorized in 1998, that would be used to treat noxious weeds under Alternative B, C, or D include (the following descriptions will not be repeated in the other alternatives):

Imazapic (Plateau) at 6 oz./acre (0.178 lb./acre of active ingredient Imazapic) applied in the fall to treat medusahead rye and cheatgrass. Application method would be by either low boom or aerial spray. Aerial spray treatments for medusahead rye and cheatgrass would be used on infestations 50 acres or greater and/or on smaller infestations where ground equipment cannot access.

Chlorsulfuron (Telar XP) is a selective herbicide used on perennial broadleaf weeds. It would be applied at 1.3 oz./acre (0.061 pounds/acre of active ingredient Chlorsulfuron) during the growing season to treat mustards and thistles that are noxious weeds. Application methods would be ground equipment with either low boom or spot spray. Accidental direct spray or spill poses a moderate to high risk to terrestrial plants and

aquatic plants (National Vegetation FEIS, p. 4-51). Drift of this herbicide presents low to moderate risk to non-target terrestrial plant species such as grasses and higher risk to sensitive terrestrial plant species such as legumes. Surface runoff of this herbicide poses no risk to terrestrial plants. This herbicide may be best used at low rates with spot applications on highly aggressive species and in areas where target plants are the dominant species (National Vegetation FEIS, p. 4-51).

Clopyralid (Transline) is a selective herbicide most effectively used post-emergence for the control of broadleaf weeds. It would be applied at 1.3 pt./acre (0.5 pounds/acre of active ingredient Clopyralid) mixed with either:

(1) 2,4D at 1qt./acre (0.95 lb./acre of active ingredient 2,4D) to treat Canada thistle, Mediterranean sage (medsage), henbane, and knapweed during the bud to bloom stage, or

(2) Chlorsulfuron at up to 1.3 oz./acre applied during the growing season to treat Canada thistle, medsage, and knapweeds.

Application method would be by ground equipment with either low boom or spot spray.

This product can affect susceptible broadleaf plants directly through foliage and indirectly by root uptake from treated soil. Direct spray poses a high risk to sensitive plant species such as legumes; direct spray also poses a low risk to tolerant species such as grasses for applications at the maximum application rate (Table 4-13 in the National Vegetation FEIS, p. 4-57). Offsite drift from low-boom ground application may cause damage to sensitive plant species (National Vegetation FEIS, p. 4-56).

Sulfometuron methyl is non-selective and is not available for use on rangelands. It is registered for use on rights-of-way (ROW), in forests and woodlands, and in recreation sites. It would be applied at up to 1 oz./ acre (0.047 lb. ai/acre) but as much as 3 oz./acre (0.14 lb. ai/acre) could be applied primarily on ROWs (along roads or powerline corridors) to treat medusahead rye. There would be low risk to sagebrush steppe plants at maximum application rates on those sites. Sulfometuron methyl would not be applied in winds greater than 7 mph as drift could cause extensive damage to vegetation at a substantial distance from the application site. Sulfometuron methyl would be used in terrestrial settings to control dense stands of invasive annual grass species. During applications of sulfometuron methyl, a drift prevention agent would be used; the current registration does not permit it to be applied through aerial application.

Treating noxious weeds with these herbicides would benefit upland vegetation within the CEAA by promoting and maintaining native and desired introduced perennial vegetation.

The Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS/ROD (October 2010), Vegetation Treatments on BLM Lands in 17 Western States FEIS/ROD (June 2007), and the Order Amending Injunction of March 1, 2011 (Case No. 83-cv-6272-AA US District Court) provide new information that enables us to use the above-listed herbicides for the treatment of noxious weeds and invasive vegetation in the Burns District. The ecological risk assessments for Imazapic, Chlorsulfuron, Clopyralid, and Sulfometuron methyl can be found in the Vegetation Treatments on BLM Lands in 17 Western States FEIS/ROD (June 2007). We will incorporate all applicable standard operating procedures and mitigating measures from the Oregon EIS (Appendix 2, pages 457-467). The two EISs extensively reviewed the available information about unintended impacts to applicators, general public, non-target vegetation, birds, fish, mammals, crustaceans, and insects, as well as relationships with different kinds of soils, solubility, and persistence in the environment. This EA will not repeat that extensive body of information and tiers to both EISs for standard operating procedures, mitigating measures, and analysis of potential herbicide impacts to off-target vegetation and unplanned herbicide contact or ingestion.

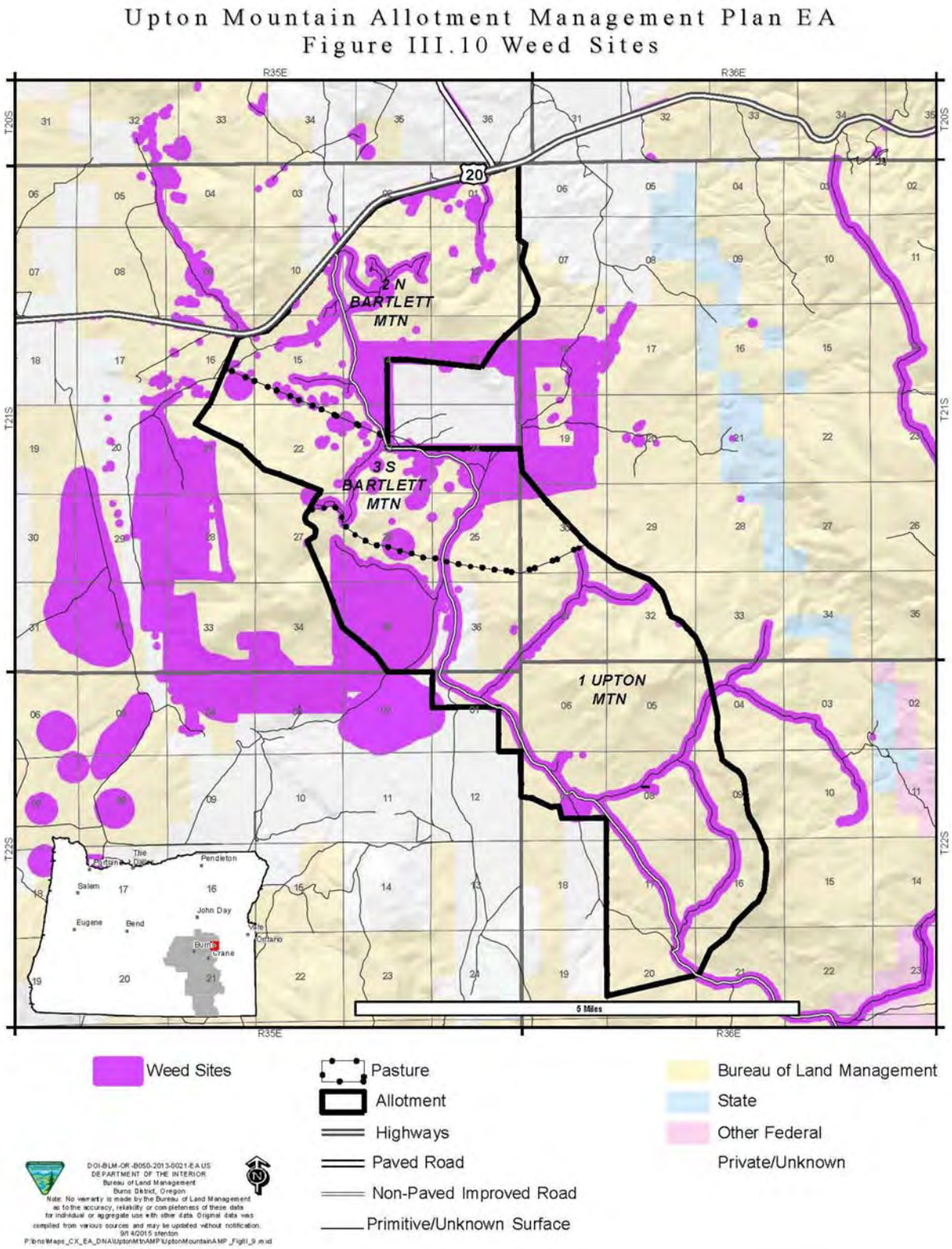
Plateau would be applied in the fall at 6–8 oz./acre to treat medusahead rye or cheatgrass because it has minimal negative effects on non-target vegetation, is used at very low rates, and has short-term residual control on annual grass seedlings. Additionally, the fall application period would minimize disturbance to sage-grouse and other wildlife species. Figure III.10 shows the known weed sites proposed for herbicide application in the Upton Mountain Allotment.

Chlorsulfuron applied during the bud to full flower stage at 1.3 oz./acre was selected to treat mustards, medsage, and thistles because it is very effective on these species, can shut down seed development, and is used at very low rates. It has low impacts to sage-grouse and other wildlife species. Spot treatments minimize impacts to non-target plant species.

Clopyralid applied during the growing season at bud to full flower stage or later in the fall is very effective for treating Canada thistle and areas where biennial thistles have produced a lot of seed. It is much more selective (particularly where brush and tree species occur) than Tordon (picloram) and can be used in many more application situations.

Sulfometuron methyl applied in the fall along ROWs, possibly at a low rate (0.5 oz./acre) and tank mixed with Imazapic, would have longer-lasting residual hold on the medusahead rye or cheatgrass than just Plateau. It would act as an effective fuel break for future fires, reducing fire spread.

Figure III.10: Weed Sites



The cumulative effects of the proposed projects would not exacerbate the situation with noxious weeds as long as the PDEs are followed to reduce the likelihood of spread.

Alternative C: Change Season of Use and Activate Suspended AUMs

Alternative C would have the same effects as Alternative B.

Alternative D: Complete Removal of Livestock Grazing

Removal of livestock grazing could reduce opportunities for noxious weed introduction and spread. Areas that are infested with medusahead rye and cheatgrass would continue to persist and spread unless treated. Removing livestock from this allotment would exacerbate the problems of wolfy decadent plants and fine fuels buildup. Decadent plants are more susceptible to noxious weed invasion and wildfire.

With no livestock in the allotment, opportunities for BLM staff and grazing permittees to discover new weed infestations would be reduced as there would be less monitoring on the allotment. New noxious weed introductions, if not discovered and treated in a timely manner, could spread rapidly and become more difficult and expensive to control. Effective weed management would be less likely to occur.

Conversion of the allotment's plant communities to an annual grass fire cycle is the main threat to rangeland health, ecological function, wildlife habitat, and sage-grouse populations and habitat on the allotment. Closing the allotment to grazing would remove one of the tools that could be used to address invasive annual grasses and buildup of fine fuels. There is no indication that the Burns District could attract enough funding to manage medusahead rye and cheatgrass on the Upton Mountain Allotment through herbicide treatments alone. Plus experience with noxious weed control generally has shown that herbicide treatments alone are rarely able to recover a site once dominated by noxious weeds. Most plant communities across the allotment are in lower seral stages due to fires; without treatment, existing noxious weeds would continue to spread and adversely impact the function, health, and ecological diversity of vegetation communities. Closing the allotment to grazing would not change or slow these impacts to the allotment's plant communities.

Cumulative Effects

All known impacts were direct or indirect and were analyzed in full above.

3. Livestock Grazing Management

Current analysis of potential effects to livestock grazing management is tiered to the 1991 Three Rivers PRMP/FEIS and relevant information contained in the following sections is incorporated by reference: Three Rivers - Chapter 2, p. 2-33 and Chapter 3, p. 3-4.

a. Affected Environment

Upton Mountain Allotment was part of the Drewsey Community Allotment until 1974. This allotment had many permittees and livestock were not intensively managed. In 1974 the Drewsey Community Allotment was divided into four allotments including the River Allotment which included Upton Mountain. The Upton Mountain Allotment was split out of the River Allotment in 1978 and had two permittees. The allotment went from two pastures to three pastures in 1997 following the 1996 Bartlett Fire. The South Bartlett Pasture was first created to protect the fire rehabilitation seeding. Three pastures allowed implementation of a deferred rotation grazing system. Water developments were constructed from time to time. As a result of this history, by 2006 much of the allotment was dominated by late successional low sagebrush and Wyoming big sagebrush plant communities which did not produce a lot of livestock forage. The 2005 AMP and the 2007 Bartlett Mountain Fire ES&R Plan identified this lack of livestock forage and recommended corrective actions.

The Upton Mountain Allotment was designated an “Improve” (I) Management Category allotment (H-1734-2 - Rangeland Monitoring Handbook) in 1984; this designation was affirmed in the 1992 Three Rivers RMP (Appendix 9-111). An “I” categorization identifies the allotment as having management or resource concerns or resource conflicts. “I” category allotments typically receive priority for funding, project implementation, and monitoring.

The current AMP has a two-year deferred rotation grazing system. During the first year of the rotation cattle start grazing in the Upton Mountain Pasture, move to the South Bartlett Pasture, and then to the North Bartlett Pasture. In the second year cattle start in the North Bartlett Pasture, move to the South Bartlett Pasture, and to Upton Mountain Pasture last. The management in the AMP has not been followed since the 2007 Bartlett Mountain Fire. There was nonuse in 2008 and 2009 for fire rehabilitation. In 2010, the permittee used 437 AUMs (27% of permitted use); $\leq$ 100 head on North Bartlett Pasture (April 1 through July 15) and South Bartlett Pasture (July 16 through August 30).

Today one grazing permit (#3601840) is authorized in this allotment. The permit authorizes grazing 201 cattle from April 1 through November 30 for 1,612 AUMs. Cattle numbers can fluctuate as long as actual use does not exceed 1,612 AUMs. The RMP also identified 771 AUMs of “suspended nonuse.” The current permittee applied for the grazing permit before the 2011 grazing season. In a letter dated December 13, 2010, the permittee requested that the grazing permit be modified to better fit their ranching business.

The situation on the Upton Mountain Allotment has substantially changed since the 2007 Bartlett Mountain Fire when 90% of the allotment burned and 10% did not. The fire rehabilitation seedings and natural recovery of native bunchgrasses in untreated burned areas were very successful. Unfortunately, the fire also released medusahead rye and cheatgrass, which are now also abundant throughout the allotment. As a result of these changes, the livestock carrying capacity of the allotment is much greater than before the fire.

Two carrying capacity estimates were prepared for this EA (Appendix C). The target utilization level for crested wheatgrass is 60%. Target utilization for native bunchgrasses is 50%. Typical pasture utilization levels after the Bartlett Mountain Fire have been under 30–40% (based on annual utilization monitoring). Carrying capacity can be calculated using the following formula and the preceding information.

Potential Stocking Level (PSL) = Target Utilization x Actual Use / Measured Utilization x Yield Index

Using 50% target utilization, post-grazing utilization monitoring data, and actual use reports, there are 6,010 AUMs of available livestock forage on the Upton Mountain Allotment.

Another method of estimating carrying capacity is using the low production estimate for each ecological site in the allotment multiplied by the acres of each ecological site. The results of this method are shown in Appendix C. This method estimated the carrying capacity for the Upton Mountain Allotment to be 3,681 AUMs when the allotment is in late seral stages. As a result of fires, almost all of the estimated annual production is now from grasses rather than from grasses and sagebrush (as would be the situation in later seral stages).

In comparison to the preceding two estimates, the current permitted use is 1,612 AUMs. The difference between production and utilization is part of the reason for the current high fine fuel loads and large amount of standing dead litter on the allotment.

b. Environmental Consequences

Effects Common to All Alternatives with Livestock Grazing

Livestock grazing on BLM lands must meet the standards for rangeland health and comply with the Land Use Plan (LUP). One objective of the proposed alternative would be to use livestock grazing as a tool to address the problem of invasive annual grasses and short fire return intervals.

Alternative A: No Action

The No Action Alternative is the grazing use described in the current grazing permit and the 2005 AMP.

Figure III.11: No Action Alternative Livestock Use Summary

Active Use AUMs	Suspended Use AUMs	Voluntary Nonuse AUMs	Current Use AUMs	Exchange of Use AUMs	Total AUMs
1,615	771	505	1,110	0	2,386

Figure III.12: Grazing Permit Mandatory Terms and Conditions

Allotment	Livestock	Season of Use	AUMS
Upton Mountain	201 cattle	04/01-11/30	1,612

Figure III.13: Grazing System - Year 1

Pasture	Cows	Time of Use	AUMS
Upton Mountain	200	04/10-06/30	539
South Bartlett	200	07/01-08/15	302
North Bartlett	150	10/01-11/15	227
Total AUMs			1,068
Voluntary Nonuse			547

Figure III.14: Grazing System - Year 2

Pasture	Cows	Time of Use	AUMS
North Bartlett	200	04/15-06/15	408
South Bartlett	200	06/16-08/15	401
Upton Mountain	150	09/15-10/31	232
Total AUMs			1,041
Voluntary Nonuse			574

The permittee's ranch and other private lands border the east and west sides of the Upton Mountain Allotment. They have another BLM allotment, Mountain Allotment, which lies southwest of Upton Mountain and also adjoins their private land. It is a higher elevation allotment and is used during the summer. Geographically, the Upton Mountain Allotment connects the permittee's ranch to their other private land and Mountain Allotment. One of the permittee's goals is to integrate Upton Mountain Allotment into their overall ranching operation. The current grazing schedule could meet the permittee's spring and fall pasture needs. They requested changing to spring and fall use periods with summer and winter use being in other locations. They also requested an increase in stocking level to better manage fuels and invasive annual grasses. They own enough livestock to utilize more AUMs on Upton Mountain.

The current grazing system provides deferment of grazing until post-seed set annually or biannually on all pastures. This kind of grazing system is appropriate for perennial bunchgrasses, the key functional group on the allotment. In the spring use pasture the invasive annual grasses would usually be green and as palatable as they get. Cows would graze them during the spring season of use and such use would switch every other year between North Bartlett and Upton Mountain Pastures. From the time when invasive annual grasses produce seed until fall rains start, they would not be grazed. From mid-June until fall rains begin, the existing grazing schedule would favor the invasive annual grasses because livestock would mostly graze the perennial bunchgrasses. The current grazing system resulted in the buildup of medusahead rye thatch. Medusahead rye thatch inhibits germination of other species' seeds while medusahead rye seeds readily germinate in the thatch (Young 1992). As a result of grazing use below carrying capacity, fine fuels from standing litter in perennial bunchgrasses continue to increase. This, in addition to medusahead rye thatch and cheatgrass litter, increases the chances of another large fire. In dry years, drinking water availability can become a problem, especially in the South Bartlett Pasture which has one spring development and one large stock pond. Water hauling has been used.

To summarize, the No Action Alternative's grazing management addresses the need for the Proposed Action, but to a lesser degree than other alternatives. Other alternatives fit the permittee's ranch operation better than the No Action Alternative. The No Action Alternative does not address fine fuels buildup due to the large difference between vegetation production and current authorized use. It only addresses invasive annual grasses in the spring-use pasture, when medusahead rye and cheatgrass would be palatable in most years. While BLM's goal for livestock grazing is not to maximize utilization, at this time on the Upton Mountain Allotment heavier utilization is an objective. Two of the three most

important threats to sage-grouse habitat on the Burns District, invasive annual grasses and altered fire regimes (Hagen 2011), are exacerbated by this alternative (the current authorized use on the Upton Mountain Allotment). The proliferation of invasive annual grasses and abundance of standing dead litter in crested wheatgrass and native bunchgrasses increases fine fuels and chances of another large fire. The mechanisms for this were described in "Vegetation."

Actions Common to Alternatives B and C

Alternatives B and C would authorize changes in season of use to spring and fall/winter, increases in livestock numbers to 450 cow/calves or cows in the fall/winter, and grazing management to address invasive annual grasses and fine fuel levels (Figure III.15). The North and South Bartlett Mountain Pastures would be used in April or May every other year. This rotation addresses the needs for the Proposed Action. In many years the May grazing period coincides with the spring critical growth stage of the perennial bunchgrasses. Switching the May-use pasture each year provides up to two years between exposures to livestock during the critical growth period. In most years the native perennial bunchgrasses are dormant during all or much of the April-use period and will complete their annual life cycles post-grazing. In some years, crested wheatgrass may be actively growing in April. When new green and dormant leaves are intermixed in the same plant, the cows are forced to eat dormant leaves, because they cannot sort out just green leaves.

Figure III.15: Upton Mountain Proposed Grazing Schedule

Year	Pasture	Cow Numbers	Use Dates	AUMs
1	North Bartlett	450	04/01–04/30	444
	South Bartlett	450	05/01–05/31	459
	Upton	450	09/07–12/15	1,479
				2,382
2	South Bartlett	450	04/01-04/30	444
	North Bartlett	450	05/01–05/31	459
	Upton	450	09/07-12/15	1,479
				2,382

Invasive annual grasses may germinate during April and May. This new growth is the most palatable growth stage of medusahead rye and cheatgrass. As a result, the cows will search out these plants. Each medusahead rye/cheatgrass that is grazed prevents seed production by that plant and prevents that plant from becoming part of the medusahead rye thatch layer and perennial plant interspace fine fuel buildup.

This grazing schedule, including proposed increased numbers, helps address the buildup of fine fuels. Using the South Bartlett Pasture earlier in the year reduces the potential effects of having only two reliable drinking water sources. Typically the stock pond will be full and the spring development will be producing as much water as it can. In many years, other locations also have water in the spring. Secondarily ample, dependable drinking water facilitates greater use of low quality, dormant forages during the April season of use. Finally, the North and South Bartlett Pastures are close to the ranch so turn out is relatively easy in either pasture. If there is a late spring snow storm the cattle are accessible. When North Bartlett is used in May, the cows have to be trailed back through South Bartlett to get to the permittee's private land and the Mountain Allotment. When North Bartlett is used first, the livestock move from north to south through the Upton Mountain Allotment, to private land, to the Mountain Allotment. The spring use under Alternatives B and

C best addresses the needs of the Proposed Action on the North and South Bartlett Pastures.

The Proposed Action would also increase the active use AUMs to 2,386 AUMs. This number is the result of restoring the suspended AUMs on the existing permit. The 2,386 AUMs that would be authorized are less than either estimated carrying capacity (3,681 AUMs or 6,010 AUMs). Increased grazing use is necessary to address fine fuel build up from invasive annual grasses and standing dead litter in perennial bunchgrasses.

In the 2012 fall/winter grazing season in the Upton Mountain Pasture, the cows concentrated grazing on medusahead rye and cheatgrass until temperatures dropped to well below zero. Grazing focused on annual grasses would, over time, reduce the composition of invasive annuals in the plant community. As analyzed in "Vegetation," fall and winter grazing with protein supplementation would maximize utilization of invasive annual grasses and bunchgrass standing dead material. Fall/winter grazing would reduce fuel loading in this pasture. The pre- and post-grazing body condition scores on the cows using this pasture during 2012 (part of the UNR study) found a drop in body condition from 4.3 to 4.2 - both acceptable body condition scores for cows in the second trimester of pregnancy. The loss of body condition was seen in younger cows. This was thought to relate to observations of older cows pushing younger cows off the protein supplement. The first year of the fall/winter grazing trial was 2012, so the cattle were inexperienced and did not efficiently use the protein supplement. In 2013, body condition scores went from 5.57 to 5.66 - good body condition scores. In 2013, the cows had figured out what to do, and young cows were separated from older cows. The weather was also conducive to fall germination of medusahead rye/cheatgrass and regrowth of bunchgrasses. So forage conditions were about as good as they could be. In 2014, the cows lost a little bit of body condition (scores dropped from 4.79 to 4.64); this is believed to be because of the unusual winter precipitation events and temperature fluctuations. Even with a little weight loss, body condition scores remained acceptable and the cows had a pregnancy rate of 99%. In general, the cows maintained a healthy weight by eating a lot of medusahead rye and cheatgrass plus a variety of native and non-native, mostly dormant perennial bunchgrasses. The Proposed Action helps address the invasive annual grass and heavy fuel loading in the Upton Mountain Pasture, or fall/winter-use pasture. The proposed fence in the Upton Pasture would allow younger cattle to be separated from older cows to lessen competition for supplement.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

The difference between Alternatives B and C is the livestock management in the fall/winter-use period. The low estimated carrying capacity for the

allotment, 3,681 AUMs, is 1,295 AUMs greater than the proposed 2,386 Active Use AUMs. Under Alternative B up to 1,295 AUMs over permitted use could be authorized. This use would be made in the fall/winter-use pasture for targeted grazing of medusahead rye and cheatgrass. Fifty percent utilization limit on native perennial bunchgrasses would apply to fall/winter use. While new growth of invasive annual grasses is the most palatable, this window is short, unpredictable, weather dependent, and could occur from September through May. Targeted grazing of medusahead rye and cheatgrass in the fall is more manageable. The amount of medusahead rye/cheatgrass forage available is known (except for fall germination), because it grew during the preceding growing season. Research in Nevada and experience on Upton Mountain Allotment found that cheatgrass retains protein into the fall (Smeltzer and Perryman 2009) and after fall precipitation, with protein supplementation, the cows prefer medusahead rye and cheatgrass litter and new shoots over dormant perennial bunchgrasses and perennial bunchgrasses with fall regrowth. This means that targeted grazing of medusahead rye/cheatgrass is more practical at this time of year. The protein supplement would be a commercial processed product, not hay. It would be provided in a form that can be moved from medusahead rye infestation to medusahead rye infestation. During the UNR demonstration project, liquid and dry supplements in tubs were used in different years.

Alternative B would authorize up to 1,295 additional AUMs for targeted grazing of medusahead rye and cheatgrass. This use would be in addition to the 1,479 AUMs of active use in the Upton Mountain Pasture. Livestock grazing would end regardless of AUMs used when the cows quit eating the invasive annual grasses. The Upton Mountain Pasture has dependable water sources scattered throughout. Dependable drinking water is necessary to maximize utilization of the low quality forages. If another pasture is used for the fall/winter-use pasture, targeted grazing AUMs would be recalculated to correspond with that pasture. At the end of this season of use, the cows move to private land.

Alternative C: Change Season of Use and Activate Suspended AUMs

Livestock management under Alternative C would be similar to Alternative B, but without additional AUMs. Protein supplement would be used to maximize the use of medusahead rye/cheatgrass in the fall/winter pasture; it would be moved from infestation to infestation. The maximum fall/winter use authorized would be 1,479 AUMs (Figure III.15). Instead of basing the end of the fall/winter-use period on removal of medusahead rye/cheatgrass and 50% utilization of native bunchgrasses, it would be based on the number of AUMs used. Permitted use would be 450 cows from September 7 to December 15.

Alternative D: Complete Removal of Livestock Grazing

There were three livestock management goals for the Proposed Action: use livestock grazing to help manage fine fuels and to manage invasive annual grasses and respond to the permittee's application to change grazing use on the Upton Mountain Allotment. As described in other sections, the No Grazing Alternative does not address either vegetation management goal. It would make the fine fuels and invasive annual grass situations worse than they are today.

The other potential impacts of selection of the No Grazing Alternative are indirect effects. Selection of the No Grazing Alternative in this EA would result in the permittee changing use on his other land assets to meet the economic demands of the ranch business. The permittee's first steps could involve finding more land or increasing the production of livestock on his private lands. The potential impact of more intensive management on private land is outside the scope of this analysis. Selection of the No Grazing Alternative for the Upton Mountain Allotment increases the need and potential for more irrigated agriculture and intensive livestock feeding operations across the fence from BLM land. In general such development would create effective fuel breaks from fires on BLM land. Sage-grouse habitat values on more intensively developed agricultural lands would decline (Hagan 2011). Ravens, a predator of sage-grouse nests and chicks, seem to be favored by development. Wildlife habitat values associated with functioning late successional sagebrush steppe would decline.

Selection of Alternative D would not meet the livestock management purpose and need for the action.

Cumulative Effects

The CEAA is Drewsey Field Ranch's private lands and BLM allotments. The reasonably foreseeable action is continued operation of the Drewsey Field Ranch as a family ranching business. A typical annual livestock and grazing management cycle for the Drewsey Field Ranch is, starting in late winter, the cows calve and the calves are branded on the ranch. In the spring some cows and calves are moved to the Upton Mountain Allotment, where they stay until late fall; others are moved to private lands adjacent to the Mountain Allotment. From there they are moved onto the Mountain Allotment until fall. During fall, the cows and calves on both allotments are gathered and moved to private land. Calves are sold in late fall. From late fall until spring, cows, replacement heifers, and bulls are fed hay on private land. Other than details related to how and when the BLM allotments are used, including the alternatives in this EA, some version of this annual schedule is expected to continue under any alternative. The number of cows owned by the ranch is expected to remain steady, at least in the short term. The permittee would adapt the ranching operation to the resulting grazing permits. This means that selection of any of the alternatives in this EA, including no grazing, at least in the short term

would not change the number of cattle in Harney County or their potential effects on the local economy or the environment, including as a source of greenhouse gasses. Selection of the No Grazing Alternative would be expected to increase livestock use and development pressure on the permittee's private lands on the northeast and southwest sides of the Upton Mountain Allotment.

4. Special Status Species - Greater Sage-Grouse

Current discussion and analysis of potential effects to SSS - fauna are tiered to the 1991 Three Rivers PRMP/FEIS and contained in the following sections: Chapter 2, p. 2-56 and Chapter 3, p. 3-9.

a. Affected Environment

There are no known federally listed T&E wildlife species found within Upton Mountain Allotment. Greater Sage-Grouse (*Centrocercus urophasianus*), a candidate species for federal listing under the Endangered Species Act (ESA), are present in the allotment and will be analyzed in this section.

The allotment is occupied sage-grouse habitat. Greater Sage-Grouse are a BLM SSS, Bird of Conservation Concern for the Great Basin Region, and a United States Fish and Wildlife Service (USFWS) candidate species under ESA. There are no active leks within the allotment. However, there is an active lek on private property approximately 0.25 miles from the allotment. There are also 10 active leks within 10 miles of the allotment and sage-grouse are observed on the allotment at all times of the year.

Sagebrush is a required component of sage-grouse habitat (Connelly et al. 2004 & Hagan 2011). Approximately 84 percent of the allotment (11,896 acres) is classified as Preliminary Priority Habitat (PPH) (or Preliminary Primary Management Area (PPMA)) and 16 percent (2,266 acres) as Preliminary General Habitat (PGH) (or Preliminary General Management Area (PGMA)). PPH is based on core habitat in the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (Hagen 2011). PGH is based on Hagen's (2011) low density habitat plus additional sagebrush habitat.

Past and present actions that potentially affect sage-grouse include: wildfires, fire rehabilitation (including seeding), livestock grazing, noxious weed control, road development and maintenance, fence and transmission line installation and maintenance, and recreational activities. Twelve wildfires have occurred in the allotment since 1980 (Figure III.3), and burned 13,070 acres (92% of the allotment). The fires did not burn uniformly and patches of sagebrush remain (Figure III.4). Late seral sagebrush plant communities were replaced by native and non-native, perennial and invasive annual grasses due to the fires and fire rehabilitation (Figure III.5). Prior to the 2007 fire, juniper had been

encroaching throughout the allotment. However, at its current distribution (<1% of the allotment) it is likely not detrimental to sage-grouse.

An analysis of National Agriculture Imagery Program (NAIP 2009) aerial photography utilizing object oriented spatial analysis software (Bender et al. 2007) was conducted to determine the current distribution and cover of sagebrush. The sagebrush canopy cover classes were based on Hagen (2011) and BLM Technical Note 417 (Karl and Sadowski 2005). Figures III.4 and III.16, 17, and 18 show the results. The shrubs are Wyoming big sagebrush and low sagebrush unless otherwise identified.

Figure III.16: Shrub cover classes, patch count, minimum patch area, maximum patch area, sum of area in class, mean area of patches, and standard deviation.

Cover Class*	Count	Minimum Area	Maximum Area	Sum Area	Mean Area	Standard Deviation
1 (0-5%)	562	0.014	10,621.00	10,846.00	19.30	447.00
2 (6-15%)	1,545	<0.000	116.00	2,193.00	4.42	5.99
3 (16-25%)	1,067	<0.000	38.00	840.00	0.78	2.50
4 (26-35%)	770	<0.000	2.86	143.00	0.18	0.28
5 (>35%)	3,094	<0.000	4.20	99.80	0.03	0.11

All area values are acres
* (Karl and Sadowski 2005)

Figure III.17: Shrub cover classes, percent of each class, sum of area in class, compared to Connelly et al. 2000 guidelines and BLM et al. 2000 guidelines.

Cover Class*	Percent Area	Sum Area	Connelly et al. 2000	BLM et al. 2000
1 (0-5%)	76.80	10,846.00	Not Meeting	Not Meeting
2 (6-15%)	15.50	2,193.00	Not Meeting	Not Meeting
3 (16-25%)	5.90	840.00	Meeting	Meeting
4 (26-35%)	1.00	143.00	Meeting	Meeting
5 (>35%)	0.70	99.80	N/A	N/A

All area values reported are in acres
* (Karl and Sadowski 2005)

Figure III.18: Shrub cover classes, percent of each class, and sum of area in class by pasture.

	North Bartlett		South Bartlett		Upton Mountain	
Cover Class*	**Sum Area**	**Percent Area**	**Sum Area**	**Percent Area**	**Sum Area**	**Percent Area**
1 (0-5%)	2,720.00	76.70	2,504.90	89.60	5,616.10	72.30
2 (6-15%)	657.00	18.50	225.80	8.10	1,307.70	16.80
3 (16-25%)	149.00	4.20	53.30	1.90	636.30	8.20
4 (26-35%)	15.00	0.40	8.90	0.30	119.30	1.50
5 (>35%)	6.00	0.20	2.00	0.10	91.70	1.20

All area values reported are in acres
* (Karl and Sadowski 2005)

According to this analysis, approximately 77% of the allotment is composed of grasses, forbs, and sparse sagebrush (<5% shrub cover). Prior to the 2007 wildfire, the majority of the allotment was composed of sagebrush communities (BLM trend monitoring). Currently, the majority of the allotment does not meet sage-grouse nesting or winter habitat guidelines for shrub cover (Connelly et al. 2000 and BLM 2000). However, sage-grouse are observed on the allotment yearlong, so they must meet their habitat requirements, possibly at sub-optimal levels. Sveum et al. (1998) and Freese (2009) found that sage-grouse used small patches of sagebrush with higher cover (>15%) embedded in large areas of lower cover (5-15%) for nesting, brood rearing, and winter habitat. Increasing edge effect can be beneficial to sage-grouse, because ecotones can provide more habitat values. Nevertheless, at the allotment scale, nesting, early brood rearing, and winter habitat appear to be limiting because intact sagebrush patches with >15% cover occupy about 1,080 of the allotment's 14,162 acres, are small (≤4.2 acres), and are separated by large areas with 0–5% sagebrush cover.

The residual sagebrush (Figure III.4) is described in this paragraph. One intact area of sagebrush is located in the North Bartlett Pasture approximately 0.8 mile west of the Shurtz Field lek. This area (approximately 1,100 acres) contains the four sagebrush cover classes identified in Karl and Sadowski (2005). Additionally, this area provides transition into an area that is 400 feet higher with north and east facing slopes (east face of Bartlett Mountain). These higher, wetter areas near leks and nesting habitat can produce forbs later in the brood rearing period after lower elevation vegetation is dry. Much of this higher elevation area in the South Bartlett and Upton Mountain Pastures burned in the 2014 Buzzard Complex. In 2013, sage-grouse winter scat was found in several

locations in the North and South Bartlett Pastures. Another area (approximately 250 acres) of sagebrush patches is located in the South Bartlett Pasture 0.3 mile southeast of the lek. This area connects the southwestern portion of the allotment through a narrow strip of sagebrush that could be used as a travel corridor by sage-grouse and their broods when chick mobility is still limited. The North Bartlett Pasture contains another relatively large area (approximately 325 acres) of sagebrush patches. However, this area borders Highway 20 on the north side, and is surrounded by moderate slopes which may limit its suitability for breeding, nesting, and brood rearing. The Upton Mountain Pasture contains the largest intact, contiguous sagebrush patch (1,280 acres). This area is relatively long and narrow and has the densest shrub cover in the allotment. Located on the southwestern allotment boundary, it is paralleled by the boundary fence on the west side and Warm Springs Reservoir Road on the east side. It also borders private property on the majority of its west side. The southern portion of this area has moderate slopes, possibly limiting its suitability for breeding/nesting activities. There are two more areas that have semi-continuous sagebrush in the Upton Mountain Pasture. One is across the road from the area described above. The other area is located in the northwestern part of the Upton Mountain Pasture. This area is approximately 175 acres and connects residual sagebrush in the central and western parts of the allotment. The sagebrush focus areas are shown in Figure III.6. Approximately 1,565 acres in the west side of South Bartlett and Upton Mountain Pastures burned in 2014. This area was a mixture of reburn and unburned sagebrush. In summary, intact stands of sagebrush within the allotment are limited, and thus, are of the utmost importance to sage-grouse utilizing the allotment.

The allotment contains approximately 0.85 miles of fence per square mile, and 1.45 miles of road per square mile. A transmission line and a highway (US 20) parallel the northern boundary of the allotment, and a maintained gravel road, Warm Springs Reservoir Road, runs north south through all three pastures. Raptors and ravens use the transmission towers for elevated perching sites. The hunting advantage gained from the elevated structures diminishes as the distance from the line increases, and is probably gone at distances greater than a mile. A collision with transmission lines is a potential source of mortality for sage-grouse.

b. Environmental Consequences

Effects Common to All Alternatives

The alternatives analyzed in this document may affect sage-grouse through disturbance and changes in herbaceous and shrub plant cover with the goal of increasing the landscape cover of later successional sagebrush steppe that is resistant to noxious and invasive weeds, especially invasive annual grasses. Potential disturbances due to the alternatives could occur when cattle occupy the allotment, during noxious weed treatments, and

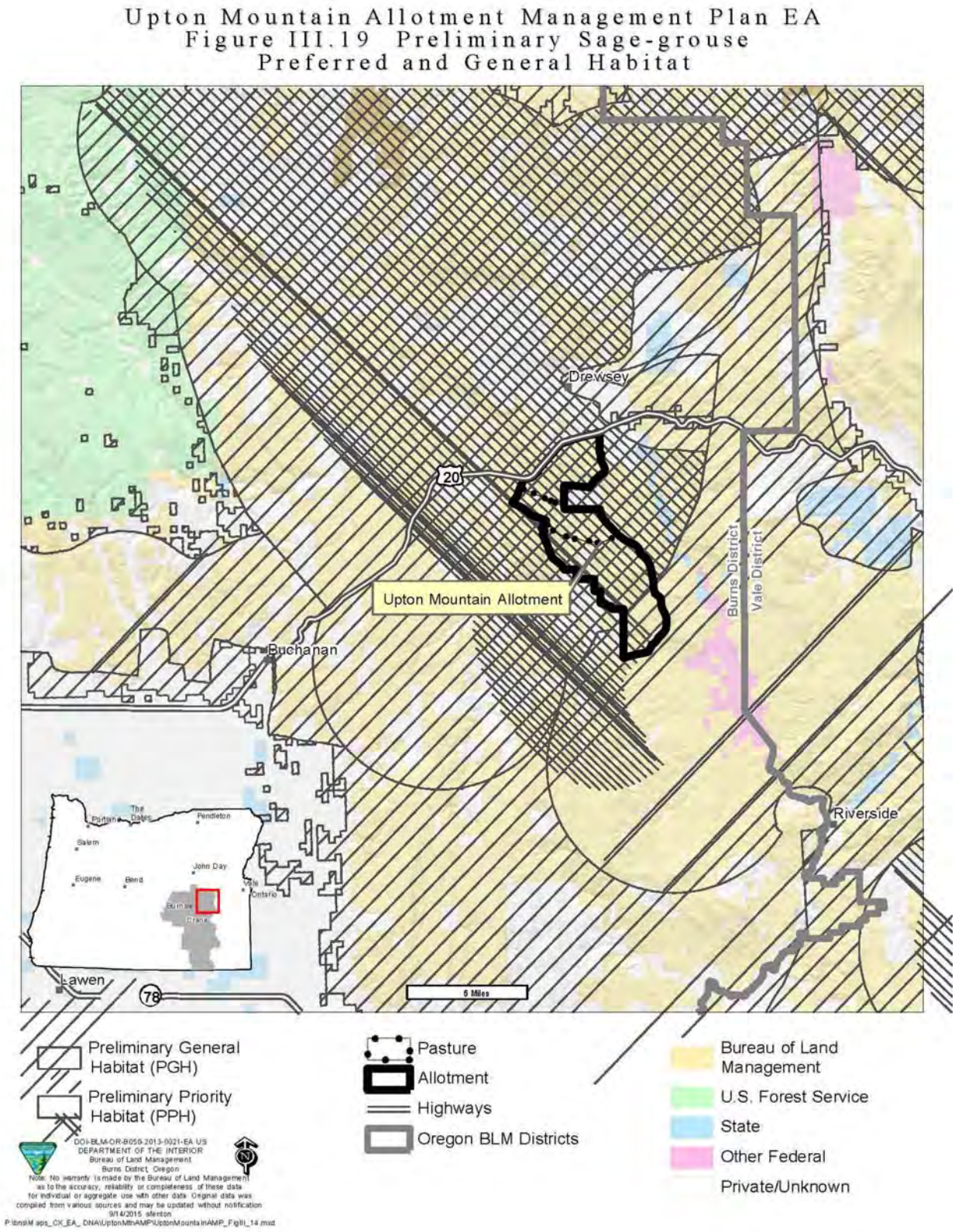
during range improvement project construction or maintenance. Livestock grazing would be managed to achieve rangeland health standards which provide adequate sage-grouse habitat (Hagen 2011) and maintain or improve sage-grouse habitat values. Road construction is not proposed. One half mile of new fence is part of the Proposed Action. The potential direct impacts from the alternatives pale in comparison to the ongoing threats from invasive annual grasses and fire; if completely successful, the Proposed Action would improve plant community resilience to disturbances, resistance to invasive annual grasses, and overall sage-grouse habitat quality of the area of core habitat in the Drewsey area (Hagen 2011) (Figure III.19).

Alternative A: No Action

Under the No Action Alternative livestock grazing would be managed in a two year graze/defer rotation. The authorized number of cattle would be 200 in the summer and 150 in the fall (Figure III.13). Livestock would be present during nesting and early brood rearing in either North Bartlett or Upton Mountain Pasture. South Bartlett Pasture would be used during late brood rearing every year. The third pasture, Upton Mountain or North Bartlett, would be used in the fall. In the second and third pastures, surface water availability could be limited and sage-grouse and livestock use would overlap at surface water sources. Livestock grazing use would continue to be much less than carrying capacity. Light utilization would provide ample herbaceous cover for nest concealment. Where sagebrush cover was absent, sage-grouse could nest under tall bunchgrasses (Hagen 2011).

This alternative does not address or alleviate two of the three main threats to sage-grouse habitat on the Burns District and this allotment which are invasive annual grasses and altered fire regimes (Hagen 2011). Under the no action alternative, the plant communities are on a successional trajectory towards an invasive annual grass fire cycle interrupted by fire rehabilitation projects. The combination of the current grazing schedule and light utilization levels resulted in the buildup of flammable litter from medusahead rye/cheatgrass and perennial bunchgrasses. After each fire the landscape cover of medusahead rye/cheatgrass has increased and is expected to increase with each subsequent fire. Currently, these weeds are present throughout the allotment. Grazing management under this alternative would not help correct this situation. The current management is not maintaining or changing the successional trajectory toward late seral sagebrush steppe.

Figure III.19: Preliminary Sage-grouse Preferred and General Habitat



The proliferation of invasive annual grasses and abundance of standing dead litter in crested wheatgrass and native bunchgrasses would likely continue under this alternative. Under such conditions, the threat of another large fire in the allotment is high. Any fire occurring on the allotment would likely have detrimental effects on sage-grouse and their habitat as it would be expected to reduce the amount of sagebrush occurring on the allotment and increase the amount of invasive annual grasses. The habitat connectivity between existing sagebrush patches and the size of existing sagebrush patches would likely be reduced by future wildfires under this alternative. Habitat connectivity has been identified as an important habitat attribute (Connelly et.al. 2000 and Hagen 2011). In summary, this alternative would do nothing to address the invasive annual grass problem and the altered fire regimes (decreased fire return intervals) which are major threats to sage-grouse.

Actions Common to Alternatives B and C

Both alternatives B and C would help alleviate the decreased fire return interval and increased annual grass threats to sage-grouse. Changing the season of use and authorizing 2,386 AUMs of permitted grazing use would allow the use of North and South Bartlett Mountain Pastures on an early/graze rotation, April or May. The typical number of cattle would be 450. Use supervision on Upton Mountain Allotment has found that grazing in April provides perennial bunchgrasses the opportunity to regrow and set seed post-grazing even in dry years. With one of these pastures grazed in April and the other in May, there would be two pastures in the allotment with livestock during the sage-grouse nesting and early brood rearing period. The April pasture would be used during nesting and the May pasture would be used during late nesting/early brood rearing. No livestock would be on the allotment from late brood rearing until fall. Although nest concealment will likely be less under these alternatives, utilization targets would help to ensure adequate nest concealment regardless of which pasture was used first. The proposed grazing season allows Upton Mountain Pasture to be used in the fall/winter after perennial plants have completed active growth and are dormant. The 50% utilization target and the growing season rest ensures bunchgrass nest concealment cover the following spring in the Upton Mountain Pasture.

Analysis of National Agriculture Imagery Program (NAIP) imagery (USDA 2009) found 23% of the allotment has greater than 5% sagebrush cover (Figure III.17). Only a portion of the shrub habitat meets the sage-grouse habitat guidelines in Connelly et al. 2000 and BLM 2000 (Figures III.17 and 18). This makes preserving remaining sagebrush and increasing the landscape cover of sagebrush very important. Cattle are expected to use open areas (<5% sagebrush cover) in April and May. In the April

pasture the native perennial bunchgrasses would mostly be dormant. Crested wheatgrass and invasive annuals would be green or dormant. In the May pasture all the grasses would be green, protein rich, and palatable. The open areas are probably less important for sage-grouse during nesting because of lack of shrub cover. Heavy utilization in shrub interspaces would have negative effects on sage-grouse nesting success. The utilization targets (60% crested wheatgrass and 50% native perennial grasses) were designed, in part, to prevent such use and ensure herbaceous cover around shrubs during nesting season (France et al. 2008).

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non Renewable AUMs

Alternative B would best address the threats to sage-grouse habitat values in the Upton Mountain Pasture. It would make the greatest grazing use of invasive annual grasses while maintaining perennial bunchgrass vigor and productivity and providing adequate herbaceous concealment cover at nest shrubs. The proposed pasture rotation would provide planned nonuse by livestock during the breeding, nesting, and brood rearing seasons every year. The typical number of cattle would be 450. They would be in the pasture from September until they quit eating invasive annual grasses for whatever reason - fall or early winter. Observations during the fall/winter targeted grazing demonstration project found the cows made little use of the residual sagebrush patches. In 2012, they did browse on wild crabapple that was near a supplement tub. Supplement was not placed in this location in 2013 and the wild crabapple was not browsed in 2013. Otherwise, monitoring and observations found most use was on grasses and the cattle were mainly in grass areas, not residual shrub patches.

Authorization of 2,386 permitted use AUMs plus additional AUMs for fall/winter targeted grazing of invasive annuals would provide the maximum control of medusahead rye/cheatgrass among the alternatives. The amount of available medusahead rye/cheatgrass forage would be determined annually. Fall/winter targeted grazing of invasive annual grasses would reduce their cover and seed production in the next growing season and reduce thatch and standing dead in the next fire season. Targeted grazing of medusahead rye/cheatgrass reduces competition with native vegetation. Together plant community resilience increases and the risk of another large wildfire declines. The utilization target, 50% for native bunchgrasses, would ensure nest concealment cover around sagebrush during nesting. Once monitoring indicated that perennial plant interspaces were relatively free of medusahead rye/cheatgrass (target < 10% cover), the need for targeted grazing would be reevaluated. Based on the current composition of invasive annual grasses and experience with winter invasive annual grass grazing, it is expected that fall/winter targeted grazing of invasive annual grasses would remain an appropriate management tool for the term of the proposed 10-year grazing permit. If it

was determined (through lek counts and vegetation monitoring) that fall/winter targeted grazing was degrading sage-grouse habitat values, it would be stopped and reevaluated.

Alternative C: Change Season of Use and Activate Suspended AUMs

The potential effects of Alternative C would be similar to those of Alternative B, but the maximum livestock use would be 2,382 AUMs. This means 450 cattle would be in Upton Mountain Pasture from September 7 to December 15 annually, regardless of how much medusahead rye/cheatgrass remained.

Alternative D: Complete Removal of Livestock Grazing

Livestock would not use the Upton Mountain Allotment, and would not overlap sage-grouse use periods on the allotment. As explained in the "Vegetation" section, removal of livestock grazing would be detrimental to sage-grouse habitat values on the allotment. The two main threats to sage-grouse and sage-grouse habitat values on the Upton Mountain Allotment are expansion of invasive annual grasses and altered fire regime. While livestock grazing alone does not resolve either issue, removal of livestock grazing exacerbates the invasive annual grass and buildup of fine fuels problems and increases the chances of large fires. In the current setting, removal of livestock is the alternative most detrimental to sage-grouse habitat values and numbers on the Upton Mountain Allotment due to the expected expansion of invasive annual grasses and the likely increased frequency of large wildfires on the allotment.

Cumulative Effects

For the purposes of this analysis, the CEAA for sage-grouse extends up to ten miles beyond the allotment boundary to encompass expected movement patterns for sage-grouse that use the allotment. The CEAA includes the annual use area of non-migratory sage-grouse.

Past and present actions and events as described in "Affected Environment" have influenced the existing environment within the CEAA. RFFA in the CEAA that may contribute to cumulative effects to sage-grouse and their habitat include US Highway 20 and the powerline, the status of the town of Drewsey, ranching and other agricultural businesses, hunting and other recreational pursuits, and the Celatom mine. Estimated spatial extents of past and reasonably foreseeable future actions that could affect sage-grouse or habitat in the CEAA are found in Figure III.20.

Figure III.20: Special Status Species - Fauna Past and RFFA

ACTION	PAST ACTIONS			FUTURE ACTIONS		
	ACRES	SQ. MILES	MILES	ACRES	SQ. MILES	MILES
Wildfires	125,441	196.0	---	Unknown	Unknown	---
Seedings	36,914	57.7	---	None	None	---
Roads	1,260	---	836	None	---	None
Highway	210	---	29	None	---	None
Fences	---	---	598	---	---	36
Mine	465*	---	---	1,396*	---	---
Power lines	---	---	48	---	---	---

**Existing mining in 2012. Total area approved in 2012.*

5. Migratory Birds

a. Affected Environment

Migratory birds use all habitat types in the allotment for nesting, foraging, and resting as they pass through on their yearly migrations. No formal monitoring of migratory birds has been conducted on this allotment. Common species observed or expected to occur in the allotment include horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), American robin (*Turdus migratorius*), dark-eyed junco (*Junco hyemalis*), mourning dove (*Zenaida macroura*), Townsend's solitaire (*Myadestes townsendi*), and mountain bluebird (*Sialia currucoides*).

Birds of conservation concern for the Great Basin Region that may inhabit the allotment include Brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*), and loggerhead shrike (*Lanius ludovicianus*). These species tend to select sagebrush or shrubland habitats, avoiding or reducing use in areas of juniper encroachment.

b. Environmental Consequences

Effects Common to All Alternatives

Alternatives analyzed in this document may incrementally affect migratory birds through disturbance and changes to vegetation. Potential disturbances due to the alternatives would occur during weed treatments, project construction, or when cattle occupy the allotment. Grazing would be managed to achieve rangeland health standards which would be expected to provide habitat for migratory birds that require later seral

sagebrush steppe habitats. Road construction is not proposed in any alternative. Construction of 1/4 mile of new fence is proposed. The alternatives would not contribute to cumulative effects to migratory bird habitat because the primary vegetation change agents - large, repeated fires - are already occurring. Changes to vegetation due to livestock grazing in the alternatives would be temporary (lasting until vegetation re-grows) and not degrade habitat values.

Alternative A: No Action

As analyzed in the “Vegetation” section, active management is needed to move most of the plant communities on the allotment toward later successional stages that would meet Standards. Continuing the current management would likely result in land health standards not being met during the term of a new permit and habitat conditions for the majority of migratory birds would deteriorate, especially for shrub dependent species. The current management has resulted in a buildup of fine fuels, expansion of invasive annual grasses, and repeated wildfires. Perennial grasses (native and non-native) would provide habitat for nesting and foraging for ground nesting bird species, however, another wildfire could decrease the shrub and possibly what little juniper cover remains on the allotment. This would be detrimental to species that use juniper or sagebrush habitats. Horned larks, a grassland species, are frequently observed on the allotment.

Actions Common to Alternatives B and C

These alternatives would ensure herbaceous cover for nest concealment during the breeding season in two pastures each year and all three in many years. With more cattle, the risk of trampling increases but is still considered occasional. This would apply to the North and South Bartlett Pastures which would be used during nesting season in the spring. Research by Guthery and Bingham (1996), in combination with the proposed perennial bunchgrass utilization targets, indicates that the proposed number of cattle would not impact ground nesting birds that nest near the base of sagebrush and other shrubs.

In general, livestock grazing in the spring can reduce herbaceous screening cover at nests, which in turn may increase the risk of predation. The 50% utilization target for native bunchgrasses would help to reduce this threat, but the threat would still likely be higher than that resulting from Alternative A. Livestock presence during nesting increases the potential for disturbance or flushing of nesting birds.

Areas within 1/4 mile of water sources would continue to receive the heaviest utilization and be at risk from noxious weeds. As a result, such areas are routinely monitored for noxious weeds, which are treated when found. These factors are not expected to affect populations of migratory birds. In general, reducing threats from invasive annual grasses and fire

danger resulting from fine fuel loading would benefit migratory birds. Generalist grassland species such as horned larks and meadow larks may benefit from, or tolerate, the conversion from shrubs to grasses. Birds that use shrub and juniper habitats probably won't. Residual shrub and juniper communities would provide nesting habitat and forage for migratory birds. Reducing invasive annual grasses while promoting perennial herbaceous plants would provide and improve habitat for ground nesting birds while increasing forage from seeds and insects.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

Alternative B is designed to provide adequate herbaceous cover during the breeding season while reducing threats from invasive annual grasses and fire. Planned pasture rotations would ensure herbaceous cover for nest concealment for ground nesting birds in two of three pastures every year. Post-grazing utilization monitoring in each pasture has documented ample herbaceous cover remained in all pastures.

In a low production year in the May-use pasture, increased authorized use could reduce nest concealment cover for ground nesting birds. The utilization limits are expected to provide nest concealment cover at nest shrubs. As succession progresses, the allotment would become a "patchy" combination of shrub steppe, grass, and, to a smaller proportion, juniper. Interspaces would produce forbs, insects, and small mammals which provide food for migratory birds and raptors. Heavy livestock grazing (exceeding the utilization target) of herbaceous vegetation in the shrub canopies would impact sagebrush obligate species. The 50% utilization targets for native perennial bunchgrasses would help prevent both circumstances. Increased grazing to manage invasive annual grasses and fine fuels and reduce fire frequency would benefit sagebrush obligate bird species' habitat values.

Additional AUMs for targeted grazing would only be authorized when invasive annual grass production and fine fuel levels allowed. Since this would be fall/winter use, the amount of invasive annual grass and fine fuel forage available would be known before the start of the grazing period. Utilization would not exceed 50% on native perennial grasses. With utilization below 50%, ample herbaceous cover would remain for nest concealment the following spring. For the reasons described in "Vegetation" and "Range Management," most livestock utilization would be on grasses in grass-dominated communities and, to a lesser extent, on grasses in shrub interspaces. In summary, in the long-term, Alternative B would promote better habitat conditions for shrub and juniper dependent migratory bird species using the allotment because of improved range conditions, fewer invasive annual grasses, and a transition to more late successional species. All of this should result in an increase in migratory bird species richness.

Alternative C: Change Season of Use and Activate Suspended AUMs

The effects in Alternative C would be similar to those in Alternative B, but with less targeted invasive annual grass use during the fall/winter grazing period. This would likely lead to a slower recovery of the range condition and transition to late successional species, which means the benefits to migratory birds would likely take longer as opposed to Alternative B.

Alternative D: Complete Removal of Livestock Grazing

Under this alternative, the potential conflicts between livestock use and migratory birds identified for the other alternatives would be avoided; however, the two main threats to habitat of most migratory birds on the allotment, invasive annual grass expansion and repeated fires, would not be addressed. Elimination of livestock grazing would eliminate one of the tools that could help address these issues. Implementation of this alternative would result in expansion of invasive annual grasses, a slow decline in perennial bunchgrasses, decreasing sagebrush cover, and repeated fires, all of which would be detrimental to most species currently utilizing the allotment and would ultimately result in a loss of migratory bird species richness.

Cumulative Effects

For the purposes of this analysis, the CEAA for migratory birds extends up to ten miles beyond the allotment boundary to encompass regular movements while in the project area. Past and present actions and events as 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 US Highway 20 and the powerline, the status of the town of Drewsey, the statuses of area ranches, other agricultural businesses, hunting and other recreational pursuits, and operation and expansion of the Celatom mine northeast of Drewsey, Oregon. The extents of past and reasonably foreseeable future actions that may affect migratory birds or habitat in the CEAA are found in Figure III.21.

6. Wildlife/Locally Important Species and Habitat

Current discussion and analysis of potential effects to wildlife are tiered to the 1991 Three Rivers PRMP/FEIS and relevant information contained in the following sections is incorporated by reference: Three Rivers - Chapter 2, p. 2-66 and Chapter 3, p. 3-9.

a. Affected Environment

This allotment is in a semi-arid environment, with eleven to thirteen inches of precipitation annually. The allotment contains approximately 0.85 mile of fence per square mile, and 1.45 mile of road per square mile. A transmission line and US Highway 20 parallel the northern boundary of

Figure III.21: Migratory Birds Past and RFFA

ACTION	PAST ACTIONS			FUTURE ACTIONS		
	ACRES	SQ. MILES	MILES	ACRES	SQ. MILES	MILES
Wildfires	125,441	196.0	---	Unknown	Unknown	---
Seedings	36,914	57.7	---	None	None	---
Roads	1,260	---	836	None	---	None
Highway	210	---	29	None	---	None
Fences	---	---	598	---	---	36
Mine	465	---	---	1,395	---	---
Power lines	---	---	48	---	---	---

the allotment. Runoff catchments usually have water in the spring, with some providing water year round. Developed springs and wells provide water year round. Available surface water usually declines from summer until fall precipitation begins.

Past and present actions and events that probably influenced wildlife include: wildfires, livestock grazing, noxious weed control, seeding, fire rehabilitation treatments, road development/maintenance, fence and transmission line installation, and recreational activities. Wildfires that have occurred in the allotment since 1996 burned approximately 13,070 acres, 92 percent of the allotment (Figure III.5). The fires did not burn uniformly and patches of sagebrush remain. Burned late seral sagebrush plant communities were replaced by native and non-native perennial and invasive annual grasses. Prior to the fires, juniper was encroaching throughout the allotment. However, at its current level (<1%) it has little effect on wildlife.

Elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*) use the area in the winter, during seasonal migrations, and yearlong. Additionally, the allotment is part of a migratory corridor used by mule deer and pronghorn to travel from higher elevations on the forest to lower elevations in the shrub steppe and flats (ODFW, personal communication). The allotment still has some shrubs, such as sagebrush, bitterbrush, and wild crabapple. Antelope bitterbrush is a key forage component for mule deer (Kufeld et al. 1973). Ungulates are dependent on browse species in the winter when forage is limited (Bender et al. 2007). In the spring and early summer, ungulates use annual and perennial forbs when available. Forbs, which have high nutritional value,

are an important component of spring mule deer and pronghorn diets, especially when their fat reserves are low and females are in the last trimester of gestation.

Mule deer populations are below management objective in this game unit (Malheur River). Sixty three percent (8,911 acres) of the allotment is mule deer winter range (ODFW). Elk and pronghorn are within management objectives in their respective game units (High Desert and Malheur). The current dominance of grasses better satisfies pronghorn and elk dietary requirements than mule deer dietary requirements.

According to the NAIP imagery, approximately 77% of the allotment is currently composed of grasses, forbs, and sparse sagebrush (<5% cover) (Figures III.4 and III.16 and 17). Unburned slopes still contain antelope bitterbrush, as a minor component, intermixed with sagebrush which provides good mule deer habitat through winter and spring. The east side of the allotment provides winter habitat for mule deer because of availability of water and south facing slopes. Six AUMs are allocated for deer in the allotment. No AUMs are allocated for other big game species within the allotment (Three Rivers RMP, Appendix 9, p. Appendices 111). All of these allocations are less than the amount of big game use the allotment receives.

Other wildlife likely present in the allotment include coyote (*Canis latrans*), bobcat (*Lynx rufus*), several smaller mammals, reptiles, 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.

b. Environmental Consequences

Effects Common to All Alternatives

Alternatives analyzed in this document may incrementally affect wildlife by changing the periods when livestock use the allotment. Livestock have been in the general area since the 1880s and wildlife populations have adapted to their presence. Disturbances could occur during project construction or maintenance and weed treatments. Achieving rangeland health standards is expected to maintain adequate habitat for wildlife. No new roads are proposed. One quarter mile of new fence is proposed.

Alternative A: No Action

Under the No Action Alternative, grazing management would use a graze/defer pasture rotation. Use in the first pasture precedes and overlaps antelope fawning. The value of winter ranges has declined due to fires and loss of shrubs. Antelope, mule deer, and elk are seen on the allotment during the winter. Utilization would continue to be below carrying capacity. Cattle are in one pasture at a time so big game can avoid them.

Threats associated with invasive annual grasses and repeated fires would not be addressed. The proliferation of invasive annual grasses and standing dead litter in crested wheatgrass and bluebunch wheatgrass increase the fine fuel levels and chances of another large wildfire. The mechanisms for this were analyzed under "Vegetation." In the event of another wildfire, more sagebrush and possibly bitterbrush would burn. This would have negative effects on sagebrush obligate species and ungulates using the allotment. Existing shrub communities in the allotment provide some winter forage and cover to wildlife.

Actions Common to Alternatives B and C

Alternatives B and C would authorize changes in season of use, stocking level, and grazing management. Changing the season of use maximizes the potential for targeted grazing of invasive annual grasses. There would be a typical season of use, April through May in North and South Bartlett Pastures and September 7 to December 15 in Upton Mountain Pasture, and a typical number of cows, 450. Activating the suspended AUMs would increase the active use AUMs from 1,615 to 2,382.

The biggest potential impact would be direct forage competition between big game, especially antelope, and cattle during spring green-up. In most years, this would be the May-use pasture. However, in warm years it might be the April-use pasture. During green-up cows still prefer grasses while antelope select the greenest new vegetation, especially forbs. Components of the alternatives would mitigate these potential impacts. The cows would be in one pasture at a time so big game could avoid them. The utilization limit would be 50% on native grasses, ensuring ample forage for both.

Antelope bitterbrush occurs on a very limited basis in the allotment because most of the allotment is below the range of bitterbrush, most of the soils are fine textured and shallow (unsuitable for antelope bitterbrush), and most of the allotment has burned. However, where it does occur it is an important winter habitat component for mule deer. Cattle will use bitterbrush anytime the grasses are not green. Peak use occurs from grass seed shatter through fall (Ganskopp et al. 1999). When snow covers the grass, livestock will also utilize bitterbrush. Some livestock use of bitterbrush is expected to occur under Alternatives B and C. Components of Alternatives B and C help mitigate these possible impacts. The fall/winter grazing use is designed to target medusahead rye/cheatgrass. Supplements would be placed at least 1/4 mile from existing shrub patches (including sagebrush, bitterbrush, and wild crabapple). The supplement provides protein that the cattle would otherwise get from grazing shrubs. Antelope, mule deer, and elk were seen on the allotment in the winter during the fall/winter targeted grazing trial. The permittee checked cows every day during the fall/winter to ensure there was water. When cattle quit grazing medusahead rye/cheatgrass,

they would be removed from the allotment. If snow covers the grass the cattle would also be removed from the allotment. Two new bitterbrush monitoring sites would be established as part of Alternatives B and C to monitor utilization and condition of residual bitterbrush.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

The difference between Alternatives B and C is grazing management during the fall/winter-use period. Total use under Alternative B would be determined by amount and use of invasive annual grasses. This alternative would allow for the most use of medusahead rye/cheatgrass, which could expedite recovery of later successional species. This would have a beneficial effect on almost all species of wildlife.

The proposed management would prevent or minimize the potential impacts described in the previous section. Cattle would be removed from the pasture when they quit eating invasive annual grasses, when native bunchgrass utilization reached 50%, or when snow cover prevented use of the invasive annual grasses.

Alternative C: Change Season of Use and Activate Suspended AUMs

The effects in Alternative C would be similar to those in Alternative B, except the fall/winter grazing would be 450 cows from September 7 to December 15 regardless of the amount of invasive annual grasses or fine fuel levels remaining. Recovery of the area and transition to late successional species would likely be slower under this alternative compared to Alternative B.

Alternative D: Complete Removal of Livestock Grazing

The No Grazing Alternative would not address the invasive annual grass, fine fuel buildup, or repeated fire issues. Under this alternative, it is very likely that invasive annual grasses would dominate the system, resulting in large fires and expansion of invasive annual grasses. This places wildlife habitat values that are related to later successional plant communities or perennial grasses at great risk. Overall wildlife species diversity and habitat quality for all big game species will likely diminish under this alternative.

Cumulative Effects

For the purposes of this analysis, the CEAA for wildlife is ten miles beyond the allotment boundary. This area includes adjacent areas used by animals that use the allotment. The CEAA does not incorporate the entire annual use area for antelope, elk, or mule deer because land ownership is mixed with private, State, and Bureau of Reclamation, outside BLM management. Such analysis would be speculative. Vegetation

communities in the CEAA are similar to those on the allotment with the addition of ranches and hay fields along the Malheur River north of the allotment.

Past and present actions, such as those described in "Affected Environment" have influenced the existing environment within the CEAA. RFFA in the CEAA that may contribute to cumulative effects to wildlife and habitat include US Highway 20 and the powerline, the status of Drewsey, the statuses of area ranches and agricultural businesses, hunting and other recreational pursuits, operation and expansion of the Celatom mine, and juniper control (Otis-Moffet Table project). Past and reasonably foreseeable future actions that have affected wildlife or wildlife habitat in the CEAA are found in Figure III.22.

Figure III.22: Wildlife Past and RFFA

ACTION	PAST ACTIONS			FUTURE ACTIONS		
	Acres	Sq. Miles	Miles	Acres	Sq. Miles	Miles
Wildfires	125,441	196.0	---	Unknown	Unknown	---
Seedings	36,914	57.7	---	None	None	---
Roads	1,260	---	836	None	---	None
Highway	210	---	29	None	---	None
Fences	---	---	598	---	---	36
Celatom Mine	465*	---	---	1,395*	---	---
Power lines	---	---	48	---	---	---
Otis-Moffet Table juniper control				20,100		

**Existing mine area and authorized expansion approved in 2012*

7. Soils/Biological Soil Crusts

a. Affected Environment

Current discussion and analysis of potential effects to soils and biological soil crusts (BSC) are tiered to the Three Rivers PRMP/FEIS (September

1991) and relevant information contained in the following sections is incorporated by reference: 2-15 and 3-3.

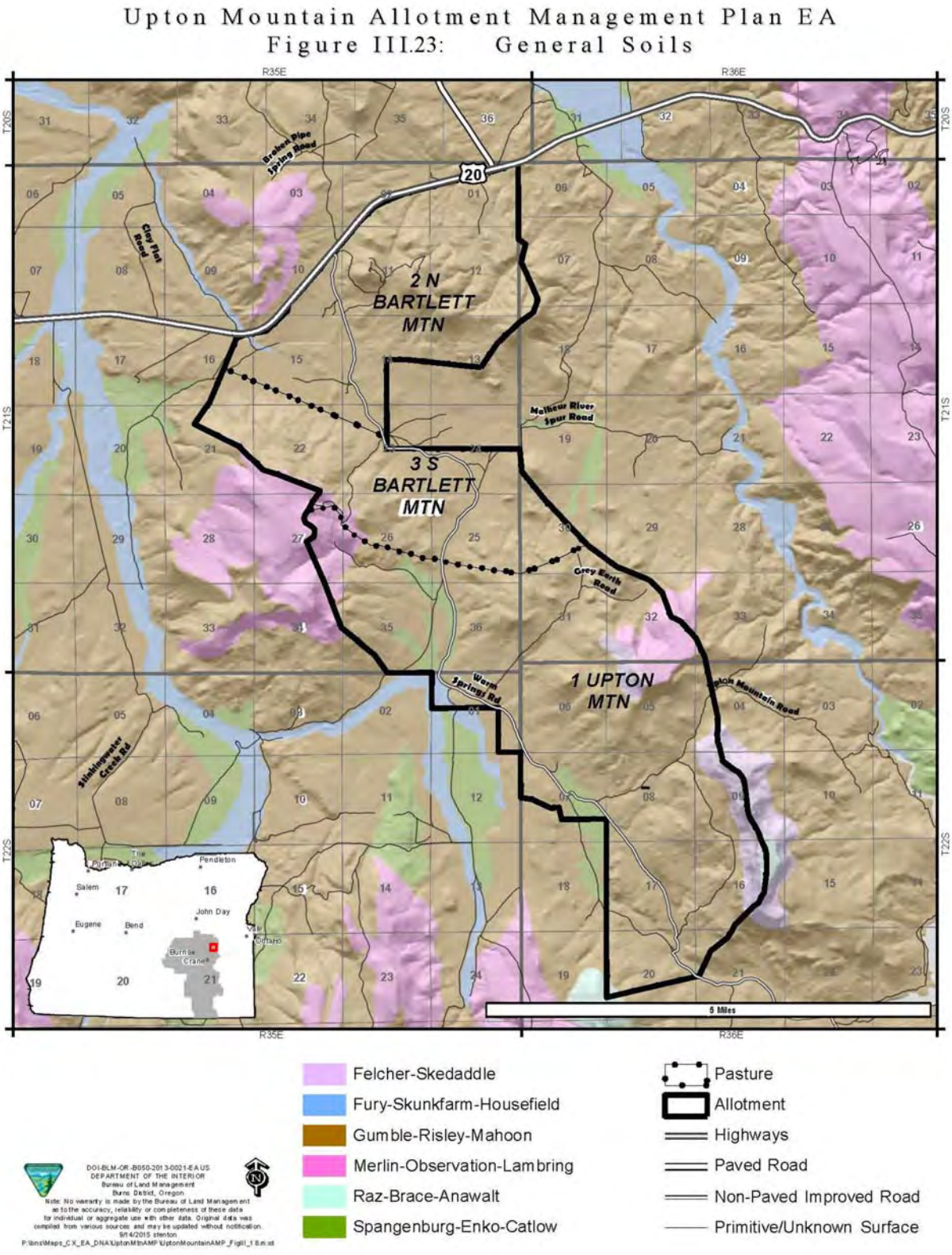
There is one major soil association within the Upton Mountain Allotment (general soil types, Burns Geographic Information System (GIS) layer), Gumble-Risley-Mahoon (approximately 99%) with occurances of Merlin-Observation-Lambring, Spangenburg-Enko-Catlow, Felcher-Skedaddle, and Fury-Skunkfarm-Housefield (combined, approximately 1%) (Figure III.23).

The Gumble-Risley-Mahoon soil association consists of shallow to moderately deep, well drained soils that range from very gravely and cobbly loams to very gravelly sandy loams. They are formed as a result of residuum and colluvium from tuffaceous siltstone and sedimentary rocks as well as from andesite, shale, sandstone, and diatomaceous earth and are found on rock pediments, hills, and tablelands. Slopes range from 2 to 50 percent. These soils have slow permeability with moderately low saturated hydraulic conductivity leading to moderate to very high surface runoff making them highly susceptible to wind and water erosion. Native vegetation associated with this soil series includes: Wyoming big sagebrush (Artemisia tridentata wyomingensis), bluebunch wheatgrass (*Pseudoroegneria spicata)*, Thurber's needlegrass (*Achnatherum thurberianum)*, Sandberg's bluegrass (*Poa secunda*), squirreltail (*Elymus elymoides)*, and basin wild rye (*Leymus cinereus)*.

Merlin-Observation-Lambring soils are well drained, shallow, moderately deep and very deep soils that formed in residuum and colluvium and are found on shrub- and grass-covered hills and mountains. Spangenburg-Enko-Catlow soils are drained and moderately well drained, very deep soils that formed in alluvium and lacustrine sediment and are found on low lake terraces. Felcher-Skedaddle soils are well drained, very shallow to moderately deep soils that formed in colluvium and residuum and are found on mountains and hills. Fury-Skunkfarm-Housefield soils are somewhat poorly drained to very poorly drained, very deep soils that formed in lacustrine sediment and are found on lake plains.

The BSCs are also known as cryptogamic, microbiotic, cryptobiotic, and microphytic crusts. "The names are meant to indicate common features of the organisms that compose the crusts. The most inclusive term is probably biological soil crust, as this distinguishes them from physical crusts while not limiting crust components to plants. Whatever name is used, there remains an important distinction between these formations and physical or chemical crusts" (Belnap 2003).

Figure III.23: General Soils



There has been little BSC research in the northern Great Basin. As a result, little is known about the relationships between different kinds of BSCs and native vegetation communities within the Three Rivers Resource Area (RA) of Burns District BLM.

Research conducted by Ponzetti and McCune in 2001 may provide insight concerning BSC communities in the area. Also, a 2001 Technical Reference (TR) was published discussing how BSCs contribute to the functional, structural, and compositional parts of a functioning ecosystem (TR-1730-2, Biological Soil Crusts: Ecology and Management). TR-1730-2, states that in "… a given eco-region, ecological roles of biological soil crusts can vary widely in their importance and will depend on crust composition and biomass, as well as characteristics of the specific ecosystem being considered."

Common BSC genera potentially found in Upton Mountain Allotment include, but are not limited to, Byrum, Cladonia, Collema, Didymodon, Lecanora, Megaspora, Peltigera, Psora, and Tortula. Identification of BSCs at the species level can be difficult and is not practical for fieldwork because a microscope is often necessary. Classification based on morphological groups is useful because they represent the ecological function of the organisms (TR-1730-2). BSCs can be divided into three groups based on their physical location in relation to the soil: hypermorphic (aboveground), perimorphic (at ground), and cryptomorphic (below ground).

Morphological groups likely in the allotment include:

1 - Cyanobacteria - Perimorphic/cryptomorphic

2 - Algae - Perimorphic/cryptomorphic

3 - Micro-fungi - Cryptomorphic/perimorphic

4 - Short moss (under 10mm) - Hypermorphic

5 - Tall moss (over 10mm) - Hypermorphic

6 - Liverwort - Hypermorphic

7 - Crustose lichen - Perimorphic

8 - Gelatinous lichen - Perimorphic

9 - Squamulose lichen - Perimorphic

10 - Foliose lichen - Perimorphic

11 - Fruticose lichen - Perimorphic

Morphological groups 4, 5, 7, 8, and 9 will likely be the dominant groups represented in the project area. Depending on precipitation amounts and microsites, groups 6, 10, and 11 may also be well represented where the site-specific conditions required for their growth exist. Morphological groups 1, 2, and 3 are difficult to discern in the field as they require specialized tools which are difficult to use in the field.

Soil surface microtopography and aggregate stability are important contributions from BSCs as they increase the residence time of moisture and reduce erosional processes. The influence of BSCs on infiltration rates and hydraulic conductivity varies greatly. Generally speaking, infiltration rates increase in pinnacled crusts and decrease in flat crust microtopographies. The northern Great Basin has rolling BSC microtopography and infiltration rates are probably intermediate compared to flat or pinnacled crust systems. Factors influencing distribution of BSCs (TR-1730-2) include, but are not limited to, elevation, soils and topography, percent of rock cover, timing of precipitation, and disturbance. BSCs are most susceptible to being broken or removed by livestock hoof action when soils are wet. Biological crusts on sandy soils are less susceptible to disturbance when wet. BSCs on clay soils are less susceptible when dry. BSCs on all soils are least vulnerable when froz.en or snow covered (TR-1730-2, p. 67). Soils in the lower elevations of the Upton Mountain Allotment are clayey and are therefore more susceptible to sheering and breakage during the spring when soils are wet.

Large areas of the Upton Mountain Allotment, 90%, have been altered by wildfire and fire rehabilitation seedings. Hot fire can kill BSCs. Drill seeding also disturbs the crust. Post-fire perennial bunchgrasses are associated with recovery and reestablishment of BSCs. It has been found that drill seeding bunchgrasses post-fire, in spite of the soil disturbance, facilitates biological crust recovery when invasive annual grasses were present pre-burn (Hilty et al. 2004). BSCs tend to exclude invasive annual grasses. Conversely, once invasive annual grasses are common, BSC tend to be absent. The remaining areas of sagebrush (Figure III.6) have BSC under shrubs and in the perennial plant interspaces. Crust is more common and more developed under shrubs than in plant interspaces. Short moss is the common morphological group under shrubs. BSCs on the Upton Mountain Allotment are highly disturbed and greatly reduced in area compared to site potential.

b. Environmental Consequences

Alternative A: No Action

Under the No Action Alternative, the current grazing management would continue. There would be no increase in AUMs, or changes in season of use or fuel management, or new range improvements. Livestock would continue to congregate at existing water sources, continuing to compact

soils in these areas. BSCs are not present on these sites. Under the No Action Alternative, there would be fewer livestock present when soils are most likely to be wet and BSCs are most susceptible to being broken or removed by livestock hoof action. Soils in the lower elevations of the Upton Mountain Allotment are clayey and are therefore more susceptible to sheering and breakage during the spring when soils are wet.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

Under the Proposed Action, livestock use would change resulting in the use of the North and South Bartlett Pastures from April 1 through May 31 for four weeks each on a rotating basis (April 1–April 30 and May 1–May 31) by 450 cows. Currently 200 cows use South Bartlett every year for six or eight weeks in mid-summer. Currently 200 or 150 cows use North Bartlett every other year in the spring for eight weeks or fall for six weeks, respectively (Figures III.13 and 14). In addition to the change in season of use, there would be a reinstatement of the suspended AUMs resulting in an increase in livestock. There would be an increase of 1,341 AUMs overall across the allotment. The time livestock spend in these pastures would be shortened by two or four weeks. Increased numbers of livestock could potentially result in a greater radius of soil compaction around water and mineral sources. Additionally, an increase in the number of livestock grazing at a time when soils are wet may result in more disturbances to BSCs in the form of breaking and sheering. On the other hand, there are more available water locations in the spring, resulting in fewer cows per water source. An exact percentage in the increase in impacts to BSCs cannot be calculated as there is no way to predict where livestock might graze throughout the pastures.

In the Upton Mountain Pasture, the grazing season of use would change to September 7 through December 15 from spring or fall use with an increase in AUMs from 232 or 539 currently to 1,479 under the Proposed Action and an increase from150 or 200 cows to 450 cows. Because soils would often be froz.en during the proposed season of use, the increase in AUMs would not have an effect on BSCs because they would be at their least vulnerable during this time period.

Outside of the September through December grazing season, additional grazing may be allowed in the Upton Mountain Pasture from mid-December through March. Depending on temperatures, annual precipitation, and annual snowfall, there could be impacts to BSCs in the form of sheering and breakage by hoof action if livestock are grazing when soils are wet. However, by grazing in the fall/winter and targeting invasive annual grasses, BSCs would benefit in the long term (longer than 10 years). Removing invasive annual grasses would provide spaces for BSCs to recover (one year to 50+, depending on species).

(1) Range Improvements:

The construction of three reservoirs and the reconstruction of two springs would result in the initial disturbance of soils and the removal of BSCs in the maximum two-acre footprint of each reservoir and spring. While disturbed areas would be reseeded, livestock and wildlife use would cause a minimum 50-foot radius around the reservoir of compacted soils and complete loss of BSCs as a result of moderate to heavy use/congregation. The benefit of reduction of fine fuels and reduced threat of wildfire is reducing the potential of soil loss due to erosional factors (wind and water) and complete loss of BSCs from burning. Of the approximately 14,114 acres that make up the allotment, the disturbance caused by the construction and reconstruction of the reservoirs and springs would amount to a maximum of 20 acres, which is approximately 0.10% of the allotment's total acres.

The approximately ¼-mile fence would have no effect on soils or BSCs. The total disturbance resulting from installing fence posts and wire would be undetectable.

(2) Herbicide Treatments:

There is currently no information available as to how herbicides impact BSCs with the exception of one study using glyphosate (a non-selective herbicide) on moss. The direct application of glyphosate had no short-term negative impacts on overall moss cover after one application (BLM TR-1730-2, p. 47); however, to treat most invasive weed species, including invasive annual grasses, more than one application may be needed and there is no information available on impacts to BSCs and multiple applications of herbicides. The main noxious and invasive weeds on Upton Mountain Allotment are medusahead rye and cheatgrass. Imazapic is the herbicide that BLM can currently use against these species. Where these invasive annual grasses are common, and could be treated with herbicide, they have already replaced the BSC. The risk of inadvertent application of herbicide to soil crusts results from aerial treatments that would include intermixed small patches of sagebrush steppe with soil crusts. There are no studies showing adverse effects to BSCs from Imazapic.

(3) Seeding Treatments:

Drill seeding desirable grass, shrub, and forb species following herbicide treatments would disturb soils for one to two growing seasons, depending on precipitation and vegetative growth, by loosening soils and making them more susceptible to wind and water erosion. As seeded vegetation establishes, the hazards

associated with erosion would diminish and become non-existent. The overall benefit of seeding desirable vegetation after herbicide treatments to prevent the re-establishment of invasive annual grasses outweighs the short-term (one to two growing seasons) negative effects of drill seeding. In most instances, seeding treatments would occur in areas which were moderately to heavily infested with invasive annual grasses prior to herbicide treatments. In these areas, the occurrences of BSCs would be almost non-existent since invasive annual grasses occupy the same interspaces as BSCs. As a result, there would be no short term measureable effects to BSCs. As desirable vegetation re-establishes, BSCs could re-establish beginning with cyanobacteria and mosses beginning to recover after two to five years and soil lichens after 24 years, depending on the species (BLM TR-1730-2, pages 57–58). There would be no direct or indirect impacts to soils or BSCs from aerial seeding.

Alternative C: Change Season of Use and Activate Suspended AUMs

The effects to soils and BSCs would be the same as the Proposed Action with the exception of not allowing additional use for targeted grazing of invasive annual grasses in the winter. The result would be decreased time for impacts to soils and BSCs in a warm, wet winter if the soils were not froz.en.

Alternative D: Complete Removal of Livestock Grazing

The removal of livestock from the Upton Mountain Allotment would negatively affect soils and BSCs by allowing fine fuels, including invasive annual grasses, to expand - increasing the threat of large wildfires. Increases in invasive annual grasses will reduce BSCs because they occupy the same interspaces as BSCs.

Cumulative Effects

The CEAA for soils and BSCs is the allotment boundary. Past disturbances that have occurred in the allotment include, but are not limited to, effects from livestock grazing, vehicles, hunting, and human footprints. Specific contribution of these activities to current soil and BSC condition and cover are not discernable from other historic disturbances. Three large wildfires have occurred within the boundaries of the allotment. The Bartlett Fire of 1996 burned approximately 1,871 acres including 1,123 acres or 60% of the Upton Mountain Allotment. The Bartlett Mountain Fire of 2007 burned approximately 14,000 acres on the allotment (90% of the allotment). The 2014 Bartlett Fire burned and reburned an additional 1,565 acres of the Upton Mountain Allotment (11%). There have been additional small fires since 1981.

RFFAs include continued weed treatments, specifically aerial treatments for invasive annual grasses using Imazapic. Additionally, the Burns District plans to reintroduce sagebrush into the Upton Mountain Allotment using seed, plugs, or bare rootstock when the invasive annual grasses are better controlled.

Ongoing treatments in the area include ES&R projects associated with the 2014 Buzzard Complex (the 2014 Bartlett Fire was part of the Buzzard Complex) which burned over 400,000 acres total. Projects include aerial herbicide treatments for invasive annual grasses, spot treatment of other invasive weed species, drill seeding with desired non-native grass species, aerial seeding with desired native and non-native grass species, hand planting bitterbrush seedlings, hand seeding bitterbrush seed, hand planting sagebrush bare-root seedlings, fence and range improvement maintenance, and road maintenance.

8. Wetlands, Riparian Zones, and Water Quality

a. Affected Environment

There are no streams within the allotment. All drainages in the allotment are intermittent or ephemeral and are not known to support riparian vegetation. Riparian areas in the allotment are found around springs and seeps. There are five known springs within the Upton Mountain Allotment. Four of these springs have been developed to provide water for livestock. Of these four, two have exclosures around the spring source and overflow, protecting these areas from livestock impacts. These two springs, Miler Spring and Davis Spring, met Standard 2 - Watershed Function in Riparian and Wetland Areas - of the Standards for Rangeland Health and Guidelines for Livestock Management in the 2004 assessment. The riparian areas within the exclosures were at proper functioning condition (PFC). Bartlett Mountain Spring did not meet Standard 2 in the 2004 evaluation, with livestock being a causal factor. The pasture containing Bartlett Mountain Spring was rested from livestock grazing in 2008, 2009, and 2010. Following the 3 years of rest, the season of use was switched to fall/winter and the water trough was moved about ¼ mile downhill from the spring source. These changes, in concert with the steep topography between the trough and spring source, limited livestock use and have allowed an apparent upward trend in riparian function. Data has not been collected on the remaining springs within the allotment. As livestock use is concentrated around water sources, it is likely these springs do not meet Standard 2.

b. Environmental Consequences

Actions Common to All Alternatives

The CEAA for wetlands, water quality, and riparian areas does not extend beyond the springs and their associated riparian areas. All springs have been exposed to livestock grazing impacts ranging from heavy to light use. Springs that have been developed for livestock watering have been physically altered from their original condition. Surface water diversions create functional changes in the spring system by decreasing water volume and reducing soil moisture (Abele 2011). The Three Rivers RMP of 1992 directs new spring developments to be fenced to help mitigate these changes.

Actions Common to All Action Alternatives

Grazing intensity around spring sources would likely be the same regardless of the AUM differences in the various alternatives. As watering sources within the allotment are limited, use around each watering site will be high under all action alternatives. The exception is Bartlett Mountain Spring, where the combination of topography and fall/winter use limits cattle use at the spring source.

Alternative A: No Action

Riparian function would likely remain the same at the unfenced springs under this alternative. Livestock are drawn to the water at the springs and use will be concentrated there. Biodiversity at these springs would likely be low and the physical function of the spring source would continue to be threatened from livestock impacts.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

The riparian areas surrounding the Alkali and Roadside Springs should improve under the Proposed Action, which calls for fencing the spring source and overflow areas on Alkali and Roadside Springs. This will allow for the improvement/growth of riparian vegetation. Fencing the spring source will eliminate direct impacts from cattle on wet soils. Excluding livestock from these areas would improve the water quality proportionate to the exclosure’s size. The bigger the exclosure, the more capable the vegetation will be to filter sediments and nutrients.

Alternative C: Change Season of Use and Activate Suspended AUMs

Effects to riparian areas would be the same as in Alternative B.

Alternative D: Complete Removal of Livestock Grazing

This alternative would allow for the greatest protection of the physical and biotic function of springs across the allotment. There would be no need to fence springs from livestock impacts, and water diversion from the spring sources would be unnecessary. Springs that have already been developed

would not revert to pre-disturbance unless developments were physically removed and rehabilitated.

Cumulative Effects

All known impacts were direct or indirect and were analyzed in full above.

9. Special Status Species - Plants

a. Affected Environment

Current discussion and analysis of potential effects to SSS - flora are tiered to the 1991 Three Rivers PRMP/FEIS and relevant information contained in the following sections is incorporated by reference: Three Rivers - Chapter 2, p. 2-56 and Chapter 3, p. 3-9.

(1) Stanleya confertiflora, Malheur prince's plume (STCO2):

This species is of concern due to its limited distribution (found only in Harney, Baker, and Malheur counties in Oregon, and immediately adjacent Idaho), the paucity and small size of its populations, and the presence of various current and potential threats throughout its range, including herbivory or trampling by livestock, habitat degradation by off-road vehicles, and invasive weeds. The species also comprises two separate phenotypes, characterized by white versus lemon-yellow flowers, the populations of which are completely separate geographically. The taxonomic and geographic significance of these differences has yet to be resolved.

Most Oregon populations of Malheur prince's plume occur in vast open areas dominated by *Artemisia* and other rangeland shrubs, and from a distance there is often not much that distinguishes Malheur prince's plume habitat (contributing to survey difficulties when the species is not in flower). Closer up, it is apparent that the species has specific edaphic requirements, with plants typically occurring on clay-based soils with a high shrink-swell capacity that clump heavily when wet. However this varies between populations, with plants at many locations showing a relationship to bare, fluffy, seasonally cracked soils, whereas others seem superficially less restricted to clay (although closer inspection showed it was actually present, but subsurface, at these sites). Malheur prince's plume plants typically cluster in tight patches on slight to moderate inclines, with yellow-flowered populations often more northerly oriented and white-flowered populations commonly on south-facing slopes. Landscapes immediately surrounding the Malheur prince's plume microsites are comprised of various sagebrush/bunchgrass communities, depending on locality.

As noted above, Malheur prince's plume populations are restricted to deep clay soils. Mancuso (1997) describes the substrates at Idaho populations restricted to deep clay soil weathering to a popcorn or cracked surface structure, and appearing to possess a high shrink-swell capacity. Mancuso (1997) also notes that the clay beds supporting Malheur prince's plume populations apparently originated from layers of ancient volcanic ash, comprised of tiny fragments of pumice, other kinds of natural glass, and small amounts of mineral grains. These fragments readily decompose after the strata containing them are further buried. Montmorillonite, a mineral characterized by the ability to expand after absorbing water, is then the main product of decomposition. Montmorillonite feels greasy to the touch when wet, and becomes excessively gummy, a feature readily experienced after spring or summer rains at Malheur prince's plume sites in Oregon. After drying out in the summer heat, the soils shrink and crack, with Malheur prince's plume seeds often ending up in the resulting crevices, where they germinate after fall rains.

(2) Associate plant species:

Most plant species are not well-adapted to the harsh soil conditions described above, resulting in relatively low species diversity within most of the microsites that support Malheur prince's plume. Common associates at the microsite level are usually annual species, and may include the natives *Camissonia claviformis, Phacelia lutea, Layia glandulosa, Cleome platycarpa, Descurainia pinnata, Mentzelia albicaulis, Cleomella macbrideana, Epilobium brachycarpum, Blepharipappus scaber*, and *Amsinckia tessellata*, as well as several annual *Eriogonum* species (most notably *E. salicornoides*).

Native perennial forbs associating with Malheur prince's plume vary from site to site and region to region, with *Asclepias cryptoceras, Penstemon miser, P. acuminatus, Microseris troximoides, Lomatium dissectum, L. nudicaule, Rysopterus purijugas, Trifolium gymnocarpon, Helianthella cusickii, Astragalus purshii, A. newberryi*, and *Eriogonum ochrocephalum* having been recorded on the clay soils. Bunchgrass species found with *S. confertiflora* (or occurring close by) include *Poa secunda, Sitanion hystrix, Elymus glaucous, Agropyron spicatus, Stipa (=Oryzopsis) hymenoides, Stipa thurberiana*, and *Festuca idahoensis*. Both bluebunch wheatgrass *(A. spicatus*) and Idaho fescue (*F. idahoensis*) are rare microsite associates, but may be common elements of the immediately surrounding vegetation (i.e., sagebrush-steppe), where they are often significantly represented in alliance with various ecotypes of big sagebrush (*Artemisia*

tridentata). Malheur prince's plume patches may also occasionally associate with silver sage (*A. cana*).

Big sagebrush (and rarely *Artemisia arbuscula* or *Purshia tridentata*) can occasionally be found in close proximity Malheur prince's plume, typically in areas where the clay soil formations have developed more of a loamy mix (most often seen in Oregon in northeastern Malheur County). Other shrubs, with specialized edaphic affinities (including some with halophytic tendencies), will more regularly co-occur directly with Malheur prince's plume , although never in abundance. The most common of these include *Atriplex confertifolia*, *Tetradymia canescens*, *Artemisia spinosa*, *A. tripartita*, *Grayia spinosa*, and *Sarcobatus vermiculatus*. *Artemisia cana* may be a close associate in a few playa sites.

Exotic species are widespread and common throughout the range of Malheur prince's plume, although the harsh substrates the species is adapted to buffers, to a degree, the potential impact of weeds. However, this is only the case in the absence of heavy disturbance, which promotes incursions by invasive species by breaking up and mixing substrates. Weed species with the greatest current potential to impact Malheur prince's plume populations and habitat include *Cardaria draba, Onopordum acanthium, Bromus japonicus, B. tectorum, Poa bulbosa, Cirsium canadense, Taeniatherum caput-medusae, Lepidium perfoliatum, Halogeton glomerata*, and *Ranunculus testiculatus*.

(3) Interactions with exotic species:

The spread of noxious weeds through the intermountain west and Great Basin is a major concern for BLM and other land and resource managers. The most serious factors that consistently affect upland habitats of Malheur prince's plume on the Upton Mountain Allotment are invasive annual grasses, specifically cheatgrass and medusahead rye, which are competing for the same habitat and reduce the fire return intervals at or very near all of the populations.

(4) Livestock and site management:

Based on observations by Meinke (2008 and 2009) the largest impact to Malheur prince's plume by livestock is trampling when the plant is in the pre-reproductive stage during the first year of growth. Once plants reach maturity, there may be occasional selective grazing on the flowers where forage options are minimal, but overall damage from livestock is minimal.

b. Environmental Consequences

Actions Common to All Alternatives

Adaptive management and monitoring would benefit Malheur prince's plume . Burns District monitors its populations of Malheur prince's plume annually. If monitoring finds that livestock are a causal factor in the decline of Malheur prince's plume, adaptive management could be utilized to address the issue and prevent further degradation which could trend the species towards listing.

Alternative A: No Action

Under the No Action Alternative, livestock numbers and grazing rotation would remain the same. There would be no additional impacts to Malheur prince's plume outside of the current direct threats associated with invasive annual grasses and the risk of trampling by livestock during the first year of growth. Not developing specified range improvements would not have any impact on Malheur prince's plume.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

(1) Livestock Use:

Under the Proposed Action, there would be a season of use change in addition to reinstating suspended AUMs which would allow for a higher number of livestock within the North and South Bartlett Pastures for a shorter amount of time in the spring, April 1 to April 30 and May 1 to May 31, when effects from livestock in the form of trampling would have the most impacts on first year Malheur prince's plume (florettes); flowering plants would be unaffected by the change to an early graze rotation.

Reinstating 771 AUMs of suspended use would primarily occur in the Upton Mountain Pasture where only one population site has been located, totaling approximately 10 acres, and would not trend Malheur prince's plume towards listing. The fall/winter season of use in the Upton Mountain Pasture would avoid the vulnerable growth stage. Additionally, targeted grazing on invasive annual grasses would, in the long run, benefit Malheur prince's plume. Currently, the greatest threat to this species is from invasive annual grasses which compete for the same early season nutrients and inhabit the same interspaces. Grazing the invasive annual grasses in order to prevent increases in cover and spread would allow Malheur prince's plume the opportunity to compete in and expand from known sites into previously unoccupied sites.

(2) Range Improvements:

The construction of an approximately 1/4-mile fence would have no impacts on Malheur prince's plume since PDEs are in place to prevent construction within an Malheur prince's plume site. The same PDE, surveys prior to ground disturbance, would prevent the development and construction of springs and reservoirs in Malheur prince's plume sites. Additionally, the development of the two reservoirs in the North Bartlett Mountain Pasture would redistribute livestock to areas of the pasture where Malheur prince's plume has not been found, thereby reducing trampling affects from livestock on first year plants. The spring developments would be located in the Upton Mountain Pasture in areas where Malheur prince's plume has not been previously located.

(3) Herbicide Treatments:

Herbicide treatments would have no impacts on Malheur prince's plume. In addition to treating invasive annual grasses, noxious and invasive weeds would be treated using ground-based spot treatments with the applicable herbicide (see "Noxious Weed" section for list of approved herbicides). Treatment of invasive annual grasses would be accomplished using ground based treatments as well as aerial applications. These treatments would be applied in the fall, after Malheur prince's plume has senesced and seeds have been dropped. Treatment of invasive annual grasses would allow for native vegetation, including Malheur prince's plume, to reestablish and expand back into the interspaces previously inhabited by medusahead rye.

(4) Seedings:

Seedings would occur in areas where perennial grass cover is less than one plant per square meter which are most likely dominated by invasive annual grasses. Seedings would occur using rangeland drills or via broadcast seeding (aerially or via ground-based seeders). Broadcast seeding would have no effect to Malheur prince's plume. Utilizing rangeland drills for seeding could disturb Malheur prince's plume; however, by reestablishing desirable vegetation and preventing the expansion of invasive annual grasses, Malheur prince's plume would have an increased chance of propagating and expanding thus preventing the species from listing.

Figure III.24: Malheur prince's plume in medusahead rye dominated site in Shurtz Field (private land adjacent to Upton Mountain Allotment), 2005.

Alternative C: Change Season of Use and Activate Suspended AUMs

The effects to Malheur prince's plume from Alternative C would be the similar to those of the Proposed Action, Alternative B, with the exception of extended winter use for targeted grazing of invasive annual grasses. Ending the winter-use period on a specific date rather than when the livestock quit eating the invasive annual grasses would be slightly less effective and slower improving Malheur prince's plume habitat compared to Alternative B.

Alternative D: Complete Removal of Livestock Grazing

Complete removal of livestock grazing from the Upton Mountain Allotment would have adverse effects on Malheur prince's plume as a result of increased invasive annual grasses and increased fire potential. Livestock graze fine fuels (invasive and native) which carry fire. The reduction in fine fuels helps to prevent catastrophic wildfires, protecting the habitat of Malheur prince's plume in the allotment.

Cumulative Effects

For the purposes of this analysis, the CEAA for Special Status Plants is the allotment. The main previous ground disturbing activities which had impacts on SSS within the project area were the Bartlett Mountain Fire, which occurred in 2007 and totaled approximately 32,312 acres, and the 2014 Bartlett Fire, which totaled almost 4,000 acres. After the 2007 fire, the area was reseeded with a mix of native and non-native seed to reduce soil and BSC loss. The seeding was successful. Seeding treatments were warranted following the 2014 fire. Additional past actions and RFFA include, but are not limited to, livestock grazing, hunting, off-road vehicle use, and general recreation in the area.

10. Cultural Resources and Paleontology

Current discussion and analysis of potential effects to cultural heritage are tiered to the 1991 Three Rivers PRMP/FEIS and relevant information contained in the following sections is incorporated by reference: Chapter 2, p. 2-152 and Chapter 3, p. 3-21.

a. Affected Environment:

Fifteen hundred acres of cultural resource surveys have been completed in the allotment. The majority of acres completed were for fire rehabilitation clearances. The remainder was cleared for range improvement construction.

Seven sites have been recorded in the allotment. Five sites have evidence of prehistoric (before 1820) use of the allotment. One site is likely a long term campsite, two are short-term hunting camps, and one is a location where flaked stone tools were made and maintained. Two historic sites have been recorded. One is a scatter of refuse and the other is a probable homestead location from the early 20th century that failed. Various impacts to sites have been recorded over the years. They are summarized in the following figure (III.25).

Figure III.25: Impacts to Recorded Cultural Resources on Upton Mountain Allotment

Impact Type	Number of Sites	Percentage of the Total
Wildfire	5	71
Grazing	3	43
Erosion	2	29
Historic Artifact Weathering	2	29
Road Construction and Use	1	14
Unknown	1	14

The allotment is located in an area rich in paleontological localities. Most are located on steep, erosional surfaces where most impacts, except erosion, are not much of a factor on paleontological locality condition. The paleontological localities in this region are generally less than 10 million years old. Fossil specimens recovered at these localities are from the following animals: turtles, hippopotami, rhinoceros, elephants, horses, camels, peccaries, and small mammals.

The Upton Mountain Allotment has been grazed by sheep, cattle, and 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, shutting out nomadic grazers and grazers without private property, 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 BLM (established in 1946), the number of grazing managers was very low, the number of grazers was high, and grazing was more or less unmanaged. Even as late as the early 1960s, grazing levels were considerably higher than today because the grazing management infrastructure and various land management acts and regulations had not been developed to the degree they are today. Cultural resources sites were affected more intensely and to a greater depth in the past than under the more refined and controlled grazing management practices of today.

Based on field observations by BLM cultural resources staff over the last 19 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 disturbances are 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, are 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 on-going livestock grazing effects to cultural resource sites. The reoccurring cycle of ground disturbance and absence of vegetative cover along with water and wind erosion lead 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 is reduced.

Management that spreads grazing impacts more evenly over the allotment is not likely to increase the effects on cultural resources except where new congregation areas could arise. New congregation areas could arise from constructing new spring developments. It is in these areas around new water troughs that new effects (particularly hoof shear) detrimental to cultural resources could be seen.

b. Environmental Consequences

Actions Common to All Alternatives

An increase in livestock numbers either through restoration of suspended nonuse and/or temporary increases in AUMs would affect cultural resources in currently active livestock congregation areas. Increased downward disturbance of sediments in cultural sites would result, as would a loss in site integrity.

Alternative A: No Action

The No Action Alternative would generate the fewest effects on cultural resources with the exception of Alternative D. No new livestock congregation areas would be created and grazing effects outside of congregation areas would not occur.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

The proposed season of use change would probably not affect cultural resources, except in actively used congregation areas. Increased time of use may increase downward disturbance through hoof shear, wallowing, and scuffing. Renewing suspended use and a temporary increase in AUMs

for fuels and invasive grass treatment would likely not affect cultural resources in areas outside of congregation, but with increased livestock numbers sites in congregation areas would see increased downward disturbance and loss of site integrity.

Any proposed water developments (springs and reservoirs) and fence in this action alternative would likely create, enlarge, or change the shape of current livestock congregation areas. All new and re-built water developments would require a cultural resource clearance in order to locate, evaluate, and mitigate (if needed) effects to nearby cultural resource sites. The most effective method of mitigating adverse effects in the vicinity of water developments is to fence the site(s) within a spring exclosure.

Weed treatments, applied by both ground and aerial spraying, would not affect archaeological resources. However, in relation to American Indian traditional uses in the allotment, the Burns Paiute Tribe would be notified of intended spray areas prior to implementation so they could temporarily avoid those areas.

Rangeland seedings, particularly with a rangeland drill, can cause minor effects on surface archaeological resources. Proposed seeding areas would be inventoried prior to implementation and National Register eligible sites would be avoided.

This alternative would produce greater effects on cultural resources than any of the other alternatives.

Alternative C: Change Season of Use and Activate Suspended AUMs

An increase in livestock numbers through restoration of suspended nonuse would affect cultural resources in currently active livestock congregation areas. Increased downward disturbance of sediments in cultural sites would result and would cause a loss in site integrity.

See the Proposed Action for effects of rangeland improvements.

This action alternative would affect archaeological resources more than Alternatives A and D because of the increased numbers of livestock using congregation areas. However, it would affect archaeological resources less than the Proposed Action because livestock would potentially be grazing fewer days in a year.

Alternative D: Complete Removal of Livestock Grazing

The removal of livestock grazing in the allotment would affect cultural resources less than other alternatives. Continued downward disturbance at congregation areas would cease and the disturbed sediments would eventually re-vegetate. No new water developments would result in new congregation areas.

Cumulative Effects

All the potential effects to cultural resources were direct and indirect effects and analyzed in the preceding sections.

11. Recreation and Visual Resources

Current discussion and analysis of potential effects to recreation are tiered to the 1991 Three Rivers PRMP/FEIS and relevant information contained in the following sections is incorporated by reference: Three Rivers - Chapter 2, p. 2-107 and Chapter 3, p. 3-15.

a. Affected Environment

The road to Warm Springs Reservoir bisects the Upton Mountain Allotment from north to south. This road is routinely maintained by Harney County. Nevertheless, it is impassible when wet. Warm Springs Reservoir is an irrigation storage reservoir and has been almost or completely drained each summer since 2012. When the pool is low or absent, there is no recreational use of the reservoir. The other recreational use of the general area is hunting. Antelope, mule deer, and chukar are the main species hunted.

The proposed project is within Visual Resource Management (VRM) Class IV. This class allows management activities that result in major modification of the landscape. The level of change to the characteristic landscape can be high.

b. Environmental Consequences

Actions Common to All Alternatives

None of the alternatives would be expected to affect the condition of the Warm Springs Reservoir Road or the water levels in Warm Springs Reservoir. Under all alternatives the road would still be impassible when wet. The county would continue to regularly maintain it as long as they have an employee stationed in Drewsey. The controlling factors determining reservoir levels would continue to be winter precipitation and agricultural water demand near Vale, neither of which would be affected by the alternatives in this EA.

All the alternatives would conform to the standards for VRM Class IV.

The CEAA for recreation is the allotment boundary and adjacent areas. Past and present actions, such as those described in “Affected Environment - Recreation”, have influenced the existing environment within the CEAA. The RFFAs in the CEAA that may contribute to cumulative effects to recreation include hunting and other recreational pursuits, routine maintenance of existing range improvements, wildlife use, fire rehabilitation, and noxious weed treatments.

Alternative A: No Action

In the short term, hunting opportunities on the allotment and in the general area would be expected to remain as they are because the current management is part of the setting that resulted in the existing antelope, mule deer, and chukar habitat. To the extent that the current management results in a successional trajectory towards more fire and less shrubs, mule deer, and eventually antelope, habitat conditions would be expected to deteriorate. Chukars live in rocky, cheatgrass covered hills. Chukar habitat and hunting opportunities would be expected to improve.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

In the long term, as the Proposed Action results in a longer fire return interval and increased shrub cover, habitat conditions for mule deer and antelope would be expected to improve. As a result, hunting and viewing opportunities may increase. As perennial vegetation replaces invasive annual grasses, chukar populations may decline.

Alternative C: Change Season of Use and Activate Suspended AUMs

The effects would be the same as those in Alternative B.

Alternative D: Complete Removal of Livestock Grazing

The potential impacts of this alternative would be similar to Alternative A, but would occur sooner. With no livestock use the invasive annual grasses would be expected to increase in area covered and in ecological dominance faster. As a result, large fires would be more frequent. Mule deer and antelope habitat conditions would be expected to decline faster than with the other alternatives.

Cumulative Effects

All impacts were direct or indirect and analyzed in full above.

12. Social and Economic Values

a. Affected Environment

Livestock raising and associated feed production industries are major contributors to the economy of Harney County. Livestock grazing operations also have "historical value" as ranching has occurred in the area since the late 1800s. The largest portion of agricultural sales revenue in the county is derived from cattle production (65%), which is linked to the grazing of public rangelands. The cattle industry provided $37,955,000 in sales in Harney County in 2009 and $42,973,000 in 2008 (Oregon State University, Extension Service 2010).

Those engaged in ranching and forage production make up a strong component of the fabric of the local societies. Livestock grazing operations on public and private lands can have a stabilizing influence on local employment and standard of living. Hunting, hiking, and other types of dispersed outdoor recreation also contribute to the local economies on a seasonal basis. Fee hunting and recreation contributed $100,000 to Harney County alone in 2007 (Oregon State University Extension Service, 2007). The undeveloped, open spaces in the county are a tourist attraction and contribute revenue for local business.

b. Environmental Consequences:

Effects Common to All Alternatives

RFFAs such as ranching, recreational pursuits, and noxious weed treatments would continue under all alternatives. Implementation of any of the alternatives in combination with RFFA's is not expected to measurably contribute to cumulative effects. As analyzed in the "Livestock Grazing Management" section, the permittee would be expected to adapt his ranching business to any alternative selected from this EA. So, for the short term and likely for several decades, the alternative selected from this EA would not have a measurable effect on the Harney County ranching economy.

Alternative A: No Action

The value of livestock in the allotment would remain at current levels or decrease under the No Action Alternative as condition of upland plant communities would remain stable or move toward downward trend in condition with no changes in grazing management. If productivity of these rangelands declines, this could lead to lower weaning weights or a reduction in overall cattle numbers. A reduction in cattle numbers could affect the number of people that can make a living from this ranch. A visitor's experience could also be affected as rangeland health declines with decreased recreational opportunities (including hunting, wildlife and bird viewing, and OHV use). These amenities would remain but could be reduced if rangeland health is not maintained or improved.

In general, this alternative would make the permittee's ranching operation less efficient and more expensive. The current livestock use on the allotment requires more pasture moves than the Proposed Action, because the permittee's cattle have to be split into more, smaller herds. This situation requires more labor, more fuel, and more water, so is more costly than the Proposed Action Alternative. Hay production is the most expensive part of a ranching business. This alternative would require the second highest hay use, because cattle would be on the ranch all winter.

Alternative B: Proposed Action - Season of Use Change, Fuel Management with Temporary Non-renewable AUMs

The Proposed Action optimizes livestock production on the Upton Mountain Allotment in two ways. It would efficiently incorporate the allotment into the permittee's ranching business. The Proposed Action also effectively utilizes the grazing resources that are present on the allotment. Cows avoid invasive annual grasses during the summer. Livestock would not be on the allotment during the summer. As analyzed previously, cattle can readily incorporate invasive annual grasses into their diets during the rest of the year. Under the Proposed Action, livestock would be permitted on the allotment in the spring, fall, and early winter. The winter grazing trial found that in favorable years the cattle gain weight eating invasive annual grasses during the fall/winter. One result is higher calving rate and easier calving the following spring. This situation is economically beneficial to the permittee. This alternative would require the lowest hay use, eventually resulting in lower hay production costs.

Alternative C: Change Season of Use and Activate Suspended AUMs

The potential effects of this alternative are similar to those of Alternative B. The difference results from a potentially shorter winter-use period on the allotment and a longer period of feeding hay on the ranch. The economic cost of this difference would be affected by the weather. In a year when the cattle were gaining weight on the allotment, there would be a small negative effect to production from moving to the ranch. In years when cattle were maintaining themselves on the allotment, moving to hay on the ranch may slightly increase calving rate. Hay use would be similar to slightly more than Alternative B. Hay production costs would be similar.

Alternative D: Complete Removal of Livestock Grazing

This alternative would have the greatest economic impact on the permittee in the short term, and possibly longer. While the permittee has had this allotment since the 2011 grazing year, it connects his private lands and other BLM allotment. Closing the allotment to grazing would require the permittee to return to the livestock management he was implementing before 2011. This would be another change which costs money. This alternative would require the largest amount of hay use. It would require at least as much hay production as Alternative A.

Because of the invasive annual grass fire cycle, analyzed under vegetation, closing the allotment to grazing would not result in improved conditions for other values or uses of the allotment. As described under wildlife, the game species likely to benefit would be chukars. Because this area has burned repeatedly since 1981, with larger fires since 1996, the public has become accustomed to the poor ecological conditions on the allotment. Public use of the allotment would remain similar, at least in the short term.

Cumulative Effects

In 1996 the Bartlett Fire burned much of the west half of the South Bartlett Pasture. Since then the entire pasture has burned two more times, in 2002 and 2007. Ninety percent of the allotment burned in 2007. The west half burned again in 2014. The impacts of these fires and the subsequent rehabilitation have had much greater impacts to economic condition of the permittee's ranch and the Harney County agricultural economy as well as to rangeland health, wildlife habitat conditions, recreation opportunities, and VRM than any of the alternatives in this EA.

D. Discussion on Cumulative Effects

This EA analyzed the cumulative effects on resources from enacting the Proposed Action 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 of past action may be useful in two ways according to the CEQ guidance. One is for consideration of the Proposed Action's cumulative effects, and the second is 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 instance: 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.

For most resources already analyzed, the environmental consequences discussion described all expected effects, including direct, indirect, and cumulative, on resources from enacting the various 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.

Two past, present, and reasonably foreseeable future actions are present on the Upton Mountain Allotment, medusahead rye and cheatgrass expansion and control and the UNR invasive annual grass targeted grazing demonstration project. The direct and indirect effects of these activities were analyzed in this EA. These actions would be expected to continue regardless of the decision arising from this assessment.

UNR is implementing demonstration projects of targeted winter grazing of invasive annual grasses at locations in Nevada and Oregon. The Upton Mountain Pasture is one site. This project would be expected to continue for two or three years. On the Upton Mountain Pasture both cheatgrass and medusahead rye are target species. Protein supplement is placed along the Warm Springs Road, two tracks, or disturbed sites, to attract livestock to medusahead rye/cheatgrass infestations. Direct effects from this study would occur at supplement locations. Liquid and dry supplement have been used. It is placed in 25 gallon tubs. Cumulative impacts are expected to be insignificant. Grazing is already occurring. The permittee already checks his livestock, so vehicles are using the Warm Springs Road. Bird hunting (chuckars), the post big game hunting use of the allotment, is not expected to be affected by the study.

In September 2012, BLM treated invasive annual grasses in the Bartlett Mountain Fire area with an aerial application of Imazapic, an herbicide which can be selective against annual grasses. The BLM plans to follow up on this treatment in coming years with ground treatments using imazipic, as well as treat more areas in the allotment, as funding allows. medusahead rye is a big problem on the Burns District including on the Upton Mountain Allotment. The Bartlett Mountain Fire led to an increase in medusahead rye and cheatgrass composition in the burn. Annual grass control projects would be expected to continue based on cooperator participation, funding, and treatment results, regardless of the decision arising from this EA. The cumulative effects of the proposed projects would not affect the situation with noxious weeds as long as the PDEs are followed to reduce the likelihood of spread.

In 2012, almost 1 million acres of BLM lands burned in eastern Oregon. In 2014, one fire, Buzzard Complex, burned 400,000 acres on the Vale and Burns Districts. The whole Olympus Fire (2013) reburned in the Buzzard Complex. These fires illustrate BLM’s need to do a better job of proactive management to reduce fire size and reactive fire rehabilitation to reduce the chances of repeated large fires. To the extent the Proposed Action leads to more effective and more informed fuels management and fire rehabilitation it will help address this major threat to sage-grouse and sage-grouse habitat in southeastern Oregon.

IV. CONSULTATION AND COORDINATION

A. Tribes, Individuals, Organizations, or Agencies Consulted

Figure IV.1: Tribes, Individuals, Organizations, or Agencies Consulted

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
Burns Paiute Tribe	Government to government consultation.	Generally supportive of controlling invasive annual grasses and protection of traditionally used plants.
Permittee	Coordination. Requested changes to grazing permit.	Coordinated with permittee in development of the Proposed Action and analysis of the alternatives.
Harney County Court	Coordination with interested publics.	Improving Harney County economy. Concerned about the impacts of noxious and invasive weeds, fires, and sage-grouse Endangered Species Act (ESA) status.
ODFW	Coordination with interested publics.	Sage-grouse and wildlife management and status of habitat.

B. List of Preparers

Figure IV.2: List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Lindsay Davies	Fisheries and Riparian Specialist	Fish Habitat, Water Quality, Riparian-Wetland Zones, SSS – Fish
Nick Miller and Tomas Kamienski	Wildlife Biologists	Sage-grouse, Migratory Birds, Wildlife
Eric Haakenson	Outdoor Recreation Planner	Wilderness and WSAs, Wilderness Characteristics
Caryn Burri	Botanist	Soils/BSCs, SSS - plants
Tom Wilcox	Outdoor Recreation Planner	Recreation, Visual Resources
Travis Hatley	Rangeland Management Specialist - Lead Preparer	Livestock Grazing Management, Rangeland Vegetation
Lesley Richman	District Weed Coordinator	Noxious Weeds
Scott Thomas	District Archaeologist	Cultural Resources

Name	Title	Responsible for the Following Section(s) of this Document
Holly Orr	District Planning and Environmental Coordinator	Social and Economic Development
Stacy Fenton	GIS Specialist	Maps
Bill Dragt	Supervisory Natural Resource Specialist	
Richard Roy	Three Rivers Resource Area Field Manager	

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APPENDIX A
GRAZING TREATMENT DESCRIPTIONS

Early - (approximately April 15 to May 31) - This treatment provides plants opportunity for regrowth and recovery following defoliation of early plant growth by livestock. Timing of this grazing treatment in upland areas must be highly linked to soil moisture. Soil moisture must be closely monitored to ensure adequate amounts remain for regrowth and recovery of plants following livestock removal. In contrast to the uplands, riparian areas retain soil moisture much longer into the growing season. That being the case, temperature becomes more limiting for plant regrowth and recovery following defoliation by livestock. The timing of livestock removal from riparian areas must occur with sufficient time remaining in the growing season to allow plant regrowth and recovery.

Graze - (approximately May 1 to July 15) - This treatment allows for grazing during the critical growth period of most plants. Carbohydrate reserves are continually being utilized because plant structures (i.e., leaves and stems) that perform photosynthesis (i.e., manufacture carbohydrates) are repeatedly being removed by livestock. Pastures that are under the graze treatment should be provided growing season rest (see defer and rest treatments below) the subsequent year to afford plants opportunity to make and store carbohydrates (i.e., recover vigor), ripen seed, and recruit seedlings.

Defer - (approximately July 15 to October 31) - Grazing during this treatment will not begin until after most plants have reached seed ripe and have stored adequate carbohydrate reserves. This treatment meets objectives for maintaining plant populations over time by providing plants periodic opportunity to make and store carbohydrates (i.e., recover vigor), ripen seed, and recruit seedlings.

Rest - This treatment provides plants a full year of growth in the absence of grazing. They are allowed to store maximum carbohydrate reserves, set seed, and provide carryover herbage for the following year's turnout and for other multiple-use objectives (e.g., residual cover for ground nesting birds, winter forage for wildlife, residual ground cover and litter for soil protection, etc.).

Dates listed above are approximate based on general plant phenology within the project area. Annual variation in plant phenology will occur with climatic fluctuation.

APPENDIX B
DECISION DRIVERS: HERBICIDE SELECTION BY INVASIVE SPECIES

Major Drivers:

Weed(s)/Invasive Species

Plant Phenology

Site (Treatment) Objective

Site Type

- Setting
- Proximity to water

Soil Characteristics

Desirable Vegetation Constraints

Climatic Factors

Efficacy

Resistance Issues

Modes of Action (MOA)

Cost

The decision process involved in determining what herbicides, at what rates, and at what phenology or timing to use on a given weed infestation involves a complex mix of drivers. The ultimate goal of treatments is to maximize efficacy on target species, minimize damage to non-target vegetation, use the safest products for applicators and the public, minimize cost, and minimize risk to animals and fish. While there are optimal times and growth stages to treat particular weed species, the practicality of getting to all infestations at that optimal stage is unrealistic (unlikely). Additionally, weed infestations often contain multiple target species at multiple phenological stages. Herbicide mixes are often utilized to target multiple weed species that are commonly found together. Input from industry experts, local extension, weed personnel, and applicators, along with local field trials contribute significantly to the knowledge base that guides our herbicide choices. Therefore we have identified alternative treatment options to accommodate those situations in the following table.

Figure Appendix B: Decision Matrix for Potential Herbicide Treatments, Proposed Action

Species	Proposed Treatment	Formulated Product Per Acre	Lbs./Acre[1]	Treatment Considerations/Notes
Annual Grasses (including medusahead rye and downy brome)	Imazapic	6 oz.	0.09	Preferred treatment at the pre-emergent stage when other grasses and forbs are dormant in the fall.
	Imazapic + Glyphosate	6 oz. + 6 oz.	0.09 + 0.14	If some germination has started this treatment could be considered, if willing to sacrifice other emerging or greening up vegetation.
	Glyphosate	1 qt.	1	Appropriate at the seedling stage. Care should be taken to minimize damage to non-targets. Carefully consider location of treatment to minimize collateral damage.
	Hexazinone	1.5 qts.	0.75	Primarily on road ROWs.
Annual Broadleaves	Chlorsulfuron + 2,4-D			Preferred treatment. Invasive annual broadleaves often develop resistance, especially to sulfonylureas[2]. This combination adds a second method of control.
	Metsulfuron methyl + 2,4-D			Harder on some wet-meadow grass species than chlorsulfuron.
	2,4-D + Dicamba	1 qt. + 1 pt.	0.95 + 0.5	Effective on many of the invasive broadleaves but it offers no residual control.
Mediterranean sage and Houndstongue	Chlorsulfuron + 2,4-D	1.3 oz. + 1 qt.	0.0611 + 0.95	Preferred treatment if treated from rosette to flowering. It ensures burn-down and additional method of control to reduce resistance.

Species	Proposed Treatment	Formulated Product Per Acre	Lbs./Acre[1]	Treatment Considerations/Notes
	Metsulfuron methyl + 2,4-D	1.7 oz. + 1 qt.	0.06375 + 0.95	Less expensive than chlorsulfuron.
	Picloram + 2,4-D	1 qt. + 1 qt.	0.5 + 0.95	Appropriate from rosette to flowering, where there are seed banks and where soils are not sandy or gravelly, where treatments are within labeled distances from water or wells, and where adverse impacts to desirables can be minimized.
	Clopyralid			
	Clopyralid + 2,4-D			
	Aquatic Glyphosate or 2,4-D	1.5% solution (2 oz./gallon)	minimal (glyphosate: 0.02 lbs./gallon; 2,4-D: 0.03 lbs./gallon)	Should be used where treatments could get into the water.
Knapweed: Russian and Canada thistle	Clopyralid	1.3 pt.	0.49	Preferred treatment post-frost.
	Picloram	1 qt.	0.5	Appropriate at sites where there is a known seed bank, where soils are not sandy or gravelly, where treatments are within labeled distances from water or wells, and where adverse impacts to desirables can be minimized.
	Clopyralid + 2,4-D			Adding 2,4-D is helpful if treatment occurs at the bud to flowering stage.

Species	Proposed Treatment	Formulated Product Per Acre	Lbs./Acre[1]	Treatment Considerations/Notes
	Picloram + 2,4-D	1 pt. + 1 qt.	0.25 + 0.95	
	Aquatic Glyphosate	1.5% solution (2 oz./gallon)	minimal (0.02 lbs./gallon)	Formulations should be used where treatments could get into the water.
	Chlorsulfuron	1.3 oz.	0.0611	Use for Canada thistle at any stage
Mustards	Chlorsulfuron	1.3 oz.	0.0611	Preferred treatment at the flowering stage, although it is very effective over a wide phenologic range (bud to soft dough). This treatment is particularly useful when Canada thistle occurs in the infestation mix.
	Metsulfuron methyl	1.78 oz.	0.06675	Preferred at the flowering stage. It is harder on some wet-meadow grass species than chlorsulfuron.
	Chlorsulfuron + 2,4-D	1.3 oz. + 1 qt.	0.0611 + 0.95	Combination to consider using where resistance to sulfonylureas[2] is a concern. Proximity to water needs to be considered for the product choice.
	Metsulfuron methyl + 2,4-D	1.78 oz. + 1 qt.	0.06675 + 0.95	Would be used as a treatment rotation with chlorsulfuron and 2,4-D.
	2,4-D + Dicamba	1 qt. + 1 pt.	0.95 + 0.5	Use in meadows where susceptible grasses are the main desirable species.

Species	Proposed Treatment	Formulated Product Per Acre	Lbs./Acre[1]	Treatment Considerations/Notes
	Aquatic Glyphosate or 2,4-D	1.5% solution (2 oz./gallon)	minimal (glyphosate: 0.02 lbs./gallon; 2,4-D:0.03 lbs./gallon)	Formulations should be used where treatments could get into the water.
	Chlorsulfuron	1.5 oz.	0.0705	Use as a residual treatment in the fall can be useful.
	2,4-D + Dicamba	1 qt. + 1 qt.	0.95 + 1	Will take current year's growth if treatment occurs at spring and fall rosette stage.
Thistles: Bull, Canada, Scotch, Musk Thistle and Black Henbane	Chlorsulfuron	1.3 oz.	0.0611	Preferred treatment is at the rosette to bud stage. This treatment is particularly useful when Canada thistle occurs in the infestation mix.
	Metsulfuron methyl	1 oz.	0.0375	Good choice at the rosette to bud stage. It is harder on some wet-meadow grass species than chlorsulfuron.
	Chlorsulfuron + 2,4-D	1 oz. + 1 qt.	0.047 + 0.95	Combination to consider using when burn-down to prevent seed formation/set is needed or where resistance to sulfonylureas[2] is a concern. This combination adds a second method of control. Constraints listed above for chlorsulfuron need to be considered.
	Chlorsulfuron + Clopyralid	1 oz. + 1 pt.	0.047 + 0.375	Great choice when there is an established seed bank at site, treat from rosette to flowering.

Species	Proposed Treatment	Formulated Product Per Acre	Lbs./Acre[1]	Treatment Considerations/Notes
	Chlorsulfuron + Clopyralid + 2,4-D	1 oz. + 1 pt. + 1 qt.	0.047 + 0.375 + 0.95	Great choice when burn-down to prevent seed formation/set is needed and there is an established seed bank at site. Treat from rosette to flowering.
	Chlorsulfuron + Picloram	1 oz. + 1 qt.	0.047 +	Can be used when there is an established seed bank at site, treat from rosette to flowering, where soils are not sandy or gravelly, where treatments are within labeled distances from water or wells, and where adverse impacts to desirables can be minimized.
	Clopyralid + 2,4-D	1 pt. + 1 qt.	0.375 + 0.95	Treatment for young plants (actively growing thru flowering).
	Dicamba + 2,4-D	1 pt. + 1 qt.	0.5 + 0.95	Appropriate if treatment occurs at spring and fall rosettes stage.
	Picloram + 2,4-D	1 qt. + 1 qt.	0.5 + 0.95	Appropriate from rosette to flowering, where there is an established seed bank at site, where soils are not sandy or gravelly, where treatments are within labeled distances from water or wells, and where adverse impacts to desirables can be minimized.
	Triclopyr	2 qts.	1.504	Garlon 3A for aquatic sites. If plants are in water, do not treat more than 1/3 to 1/2 of water area in a single operation.
	Aquatic Glyphosate or 2,4-D	1.5% solution (2 oz./gallon)	minimal (glyphosate: 0.02lbs/gallon; 2,4-D: 0.03lbs/gallon)	Formulations could also be used where treatments could get into the water.

Species	Proposed Treatment	Formulated Product Per Acre	Lbs./Acre[1]	Treatment Considerations/Notes
Toadflax: Dalmatian and Yellow	Chlorsulfuron	1.3 oz.	0.0611	Post-frost is most effective treatment with minimal adverse impacts to desirables
	Picloram	1 qt.	0.5	Can be used post-frost.
	Chlorsulfuron + 2,4-D	1 oz. + 1 qt.	0.047 + 0.95	Can be used from rosette to flowering.
	Picloram + 2,4-D	1 qt. + 1 qt.	0.5 + 0.95	Can be used from rosette to flowering, where soils are not sandy or gravelly, where treatments are within labeled distances from water or wells, and where adverse impacts to desirables can be minimized. This is much less effective than chlorsulfuron and is harder on desirables.

1. lbs/acre calculated from the rates per acre column, and can vary based on formulation. Typical and maximum application rates are listed on Table 2-6 (*Herbicide Information for the 17 Herbicides Available Under the Proposed Action*).

2. The sulfonylureas are chlorsulfuron, metsulfuron methyl, and sulfometuron methyl. The Oregon FEIS states these herbicides can quickly confer resistance to plant populations, particularly where they are used extensively as the primary invasive plant control method in cropping systems (USDI 2010a:145).

APPENDIX C
CARRYING CAPACITY ESTIMATES

Figure Appendix C.1: North Bartlett Pasture, based on utilization monitoring and relative annual precipitation

Appendix: A

Allotment: Upton Mountain
Pasture: North Bartlett
Acres: 3,547.6

$$\text{Potential Stocking Level} = \frac{\text{Utilization} \times \text{Actual Use}}{\text{Measured Utilization} \times \text{Yield Index}}$$

Year	Target Utilization	Livestock Actual Use	Livestock Exchange Of Use	Wildlife AUMS	Wild Horse Actual Use	TOTAL Use	Percent Utilization	Yield Index	Percent Adjusted Utilization	PSL	Cumulative PSL	Acres Per AUM	Livestock AUMS
2012	50	281	0	6	0	287	13	0.68	8.84	1,623	1,623	2.2	1,617
2013	50	598	0	6	0	604	31	0.60	18.60	1,624	1,623	2.2	1,617
	50				0	0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
						0			0.00	0	0	0.0	0
Average actual use		440	0	6	0	446							

Figure Appendix C.2: South Bartlett Pasture, based on utilization monitoring and relative annual precipitation

Appendix: B

Allotment: Upton Mountain
Pasture: South Bartlett
Acres: 2,796.78

$$\text{Potential Stocking Level} = \frac{\text{Utilization} \times \text{Actual Use}}{\text{Measured Utilization} \times \text{Yield Index}}$$

Year	Target Utilization	Livestock Actual Use	Livestock Exchange Of Use	Wildlife AUMS	Wild Horse Actual Use	TOTAL Use	Percent Utilization	Yield Index	Percent Adjusted Utilization	PSL	Cumulative PSL	Acres Per AUM	Livestock AUMS
2011	50	499	0	6	0	505	16	1.34	21.44	1,178	1,178	2.4	1,172
2012	50	441	0	6	0	447	28	0.68	19.04	1,174	1,176	2.4	1,170
2013	50	345	0	6	0	351	21	1.00	21.00	836	1,062	2.6	1,056
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
						0			0.00	0	0	0.0	0
Average actual use		428	0	6	0	434							

Figure Appendix C.3: Upton Mountain Pasture, based on utilization monitoring and relative annual precipitation

Appendix: C

Allotment: Upton Mountain
Pasture: Upton
Acres: 7,770.67

$$\text{Potential Stocking Level} = \frac{\text{Utilization} \times \text{Actual Use}}{\text{Measured Utilization} \times \text{Yield Index}}$$

Year	Target Utilization	Livestock Actual Use	Livestock Exchange Of Use	Wildlife AUMS	Wild Horse Actual Use	TOTAL Use	Percent Utilization	Yield Index	Percent Adjusted Utilization	PSL	Cumulative PSL	Acres Per AUM	Livestock AUMS
2012	50	1,312	0	6	0	1,318	30	0.68	20.40	3,230	3,230	2.4	3,224
2011	50	363	0	6	0	369		1.34	0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
	50					0			0.00	0	0	0.0	0
						0			0.00	0	0	0.0	0
Average actual use		838	0	6	0	844							

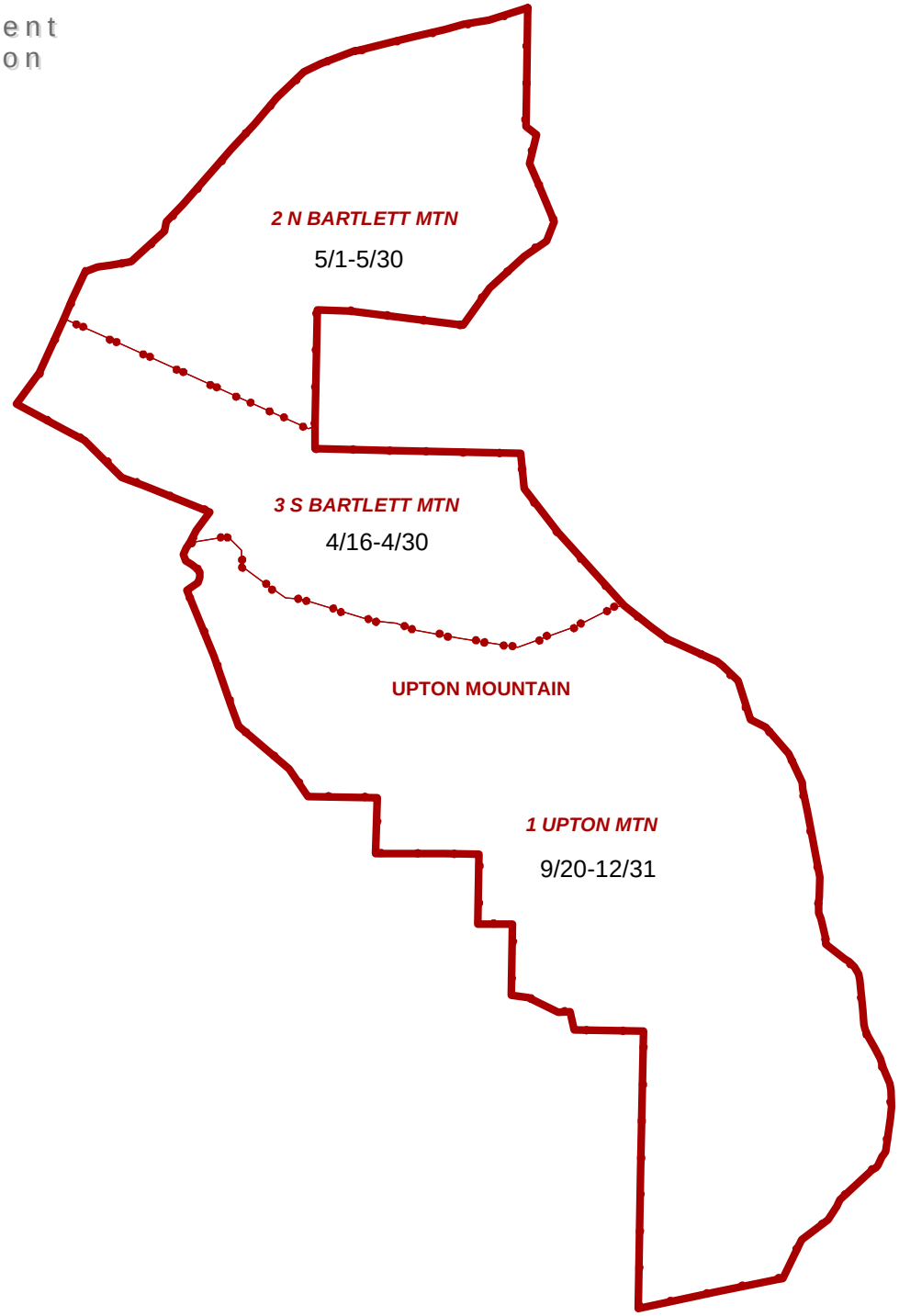
Figure Appendix C.4: Upton Mountain Allotment based on Ecological Sites

ALLOTNAME	Pasture	RANGESITE	BLM Acres Inventoried	low production	avg lbs/acre	lbs grass in pasture	AUMS
UPTON MOUNTAIN	**1 UPTON MTN**	CLAYEY 9-12	1,072.2	510			
		CLAYEY 9-12;SHALLOW 9-12	1,311.4	510			
		CLAYPAN 10-12;MT SHALLOW 9-12	28.2				
		LOAMY BOTTOM	6.0				
		MT CLAYEY 12-16	150.4				
		MT CLAYPAN 12-16	0.0				
		MT NORTH 12-16;MISC LAND TYPE	156.0	960			
		MT SOUTH 12-16;MT NORTH 12-16	242.6	900			
		SHALLOW 9-12	780.2	240			
		SHALLOW SOUTH 9-12	1,196.5	240			
		SOUTH SLOPES 8-12	10.0				
		SOUTH SLOPES 8-12;MISC LAND TYPE	411.5	375			
		SWALE 9-12	251.5				
	1 UPTON MTN Total		**7,385.2**		533.5714286	4,146,207.493	5,315.651
	2 N BARTLETT MTN	ADOBELAND 9-12;CLAYEY 9-12	0.9	795			
		CLAYEY 9-12;MT NORTH 9-12	64.8	615			
		CLAYEY 9-12;SHALLOW 9-12	1,031.9	510			
		CLAYEY 9-12;SHALLOW 9-12;SHALLOW ESCARPMENT 9-12	1,235.0	510			
		LOAMY BOTTOM	10.4				
		SHALLOW SOUTH 9-12;MT NORTH 9-12	1,161.0	510			
	2 N BARTLETT MTN Total		**3,504.1**		588	2,085,671.28	2,673.938
	3 S BARTLETT MTN	ADOBELAND 9-12;CLAYEY 9-12	71.3	795			
		CLAYEY 9-12;MT NORTH 9-12	1,055.6	615			
		CLAYEY 9-12;SHALLOW 9-12	1,564.9	510			
		CLAYEY SOUTH 9-12;MT NORTH 9-12	0.8				
		MISC LAND TYPE	7.1				
		MT CLAYPAN 12-16	28.3				
		MT SOUTH 12-16;MT NORTH 12-16	63.6	960			
		SHALLOW ESCARPMENT 9-12;SHALLOW 9-12	5.3				
	3 S BARTLETT MTN Total		**2,796.8**		720	2,013,120	2,580.923
UPTON MOUNTAIN Total			**13,686.0**				
Grand Total			**13,686.0**				

UPTON MTN **Estimated Carrying Capacity Based on ESI Reference for Low Production**

Pasture	RANGESITE	Acres Inventoried	low prod.	lbs grass/past.	AUMS	50% use
1 UPTON MTN	CLAYEY 9-12	1072.2	510	546824		
	CLAYEY 9-12;SHALLOW 9-12	1311.4	510	668821		
	CLAYPAN 10-12;MT SHALLOW 9-12	28.2	240	6778		
	LOAMY BOTTOM	6.0	312	1868		
	MT CLAYEY 12-16	150.4	590	88709		
	MT CLAYPAN 12-16	0.0	336	2		
	MT NORTH 12-16;MISC LAND TYPE	156.0	960	149805		
	MT SOUTH 12-16;MT NORTH 12-16	242.6	900	218347		
	SHALLOW 9-12	780.2	240	187259		
	SHALLOW SOUTH 9-12	1196.5	240	287165		
	SOUTH SLOPES 8-12	10.0	240	2398		
	SOUTH SLOPES 8-12;MISC LAND TYPE	411.5	375	154303		
	SWALE 9-12	251.5	240	60368		
1 UPTON MTN Total		7385.2	437.9231	2372647	3042	1521
2 N BARTLETT MTN	ADOBELAND 9-12;CLAYEY 9-12	0.9	795	746		
	CLAYEY 9-12;MT NORTH 9-12	64.8	615	39863		
	CLAYEY 9-12;SHALLOW 9-12	1031.9	510	526255		
	CLAYEY 9-12;SHALLOW 9-12;SHALLOW ESCARPMENT 9-12	1235.0	510	629849		
	LOAMY BOTTOM	10.4	312	3259		
	SHALLOW SOUTH 9-12;MT NORTH 9-12	1161.0	510	592116		
2 N BARTLETT MTN Total		3504.1		1792088	2298	1149
3 S BARTLETT MTN	ADOBELAND 9-12;CLAYEY 9-12	71.3	795	56700		
	CLAYEY 9-12;MT NORTH 9-12	1055.6	615	649193		
	CLAYEY 9-12;SHALLOW 9-12	1564.9	510	798074		
	CLAYEY SOUTH 9-12;MT NORTH 9-12	0.8	240	185		
	MISC LAND TYPE	7.1	240	1704		
	MT CLAYPAN 12-16	28.3	336	9497		
	MT SOUTH 12-16;MT NORTH 12-16	63.6	960	61032		
	SHALLOW ESCARPMENT 9-12;SHALLOW 9-12	5.3	240	1271		
3 S BARTLETT MTN Total		2796.8		1577656	2023	1011
Total Acres		14,115		5742391	7362	3681

Map C
Upton Mountain Allotment
Year 1 Grazing Rotation



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.

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Bureau of Land Management
Burns District, Oregon

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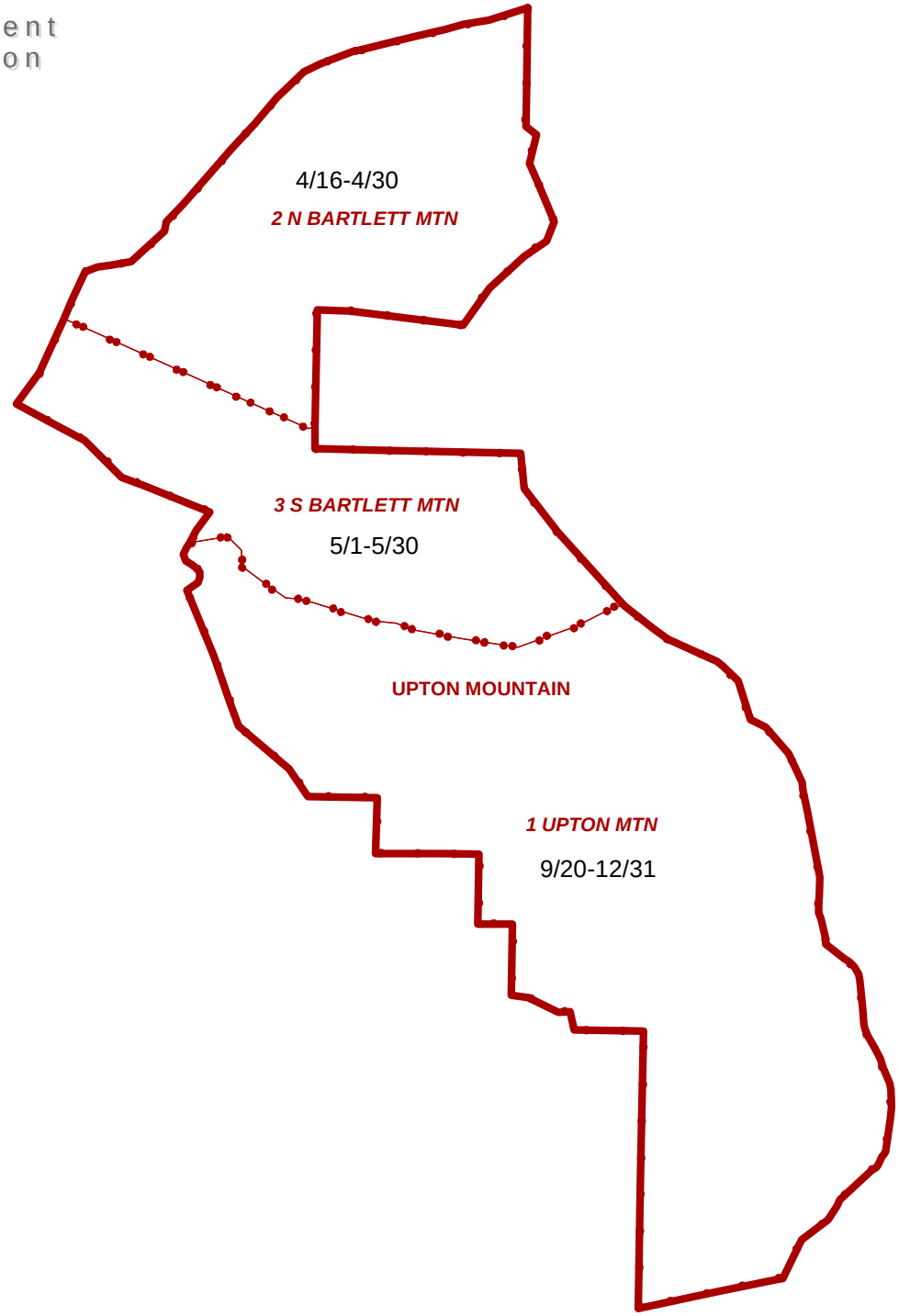
0 0.5 1 2 Miles

Map D
Upton Mountain Allotment
Year 2 Grazing Rotation



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0 0.5 1 2 Miles