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Authorization of Nonrenewable AUMs in Hammond Allotment

Environmental Assessment
DOI-BLM-ORWA-B060-2019-0006-EA

April 5, 2019

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Chapter 1 Introduction

Location and background

The Hammond Allotment is located 50 miles south of Burns, Oregon, near the town of Diamond, which is situated at the foot of the Steens Mountain. The majority of Hammond Allotment is within the Andrews Resource Area. About 1,600 acres of crested wheatgrass in the southwest corner of the allotment is within the Steens Mountain Comprehensive Management and Protection Area (Steens CMPA). There are also about 1,900 acres of privately-owned land within the allotment boundary that BLM-managed land wraps around. See maps 1 and 2 for the allotment vicinity and layout.

About 62 percent of the Hammond Allotment, particularly the western portion that is adjacent to the Malheur Wildlife Refuge, was planted to crested wheatgrass seedings up through the 1970s. The stocking rate for use by cows and calves (also known as pairs) was set for the Hammond Allotment, based on the forage available prior to the crested wheatgrass seedings being completed, at 473 animal unit months[1] (AUM), and has not been formally adjusted since. An evaluation of the forage after the crested wheatgrass seedings were established was completed in 1993 and updated in 2007; the carrying capacity was calculated at 2,700 AUMs (2007 Hammond Allotment Evaluation, Appendix B). From 1993 until 2012 there have been from 1,000 to 1,500 nonrenewable AUMs authorized to the grazing permit holder through an agreement specifically to manage the crested wheatgrass seedings. Nonrenewable AUMS are authorized on a year-to-year temporary basis and are not included on the 10-year grazing permit. The amount of nonrenewable AUMs authorized from 1993 to 2012 varied according to the weather and forage conditions of the grazing season. Use monitoring over time has demonstrated that the use of nonrenewable AUMs had been sustainable, and the carrying capacity had been consistently higher than what has been permitted.

Currently, the crested wheatgrass seedings are monoculture stands, covering a consistent set of ecological sites that transition from loam to claypan sites as elevation and precipitation increases from west to east (See map 3). The allotment has been rested from livestock grazing since 2014. As a result, the crested wheatgrass seedings have a multi-year accumulation of standing dead biomass within the "bunches." Another commonly used term for this occurrence is "wolf" or "wolfy plants," see photo 1 below. Wolfy plants have a heightened accumulation of dead material, which creates a self-shading situation at the base of the plant; as a result, the photosynthesis and transpiration are reduced. High photosynthetic rates are critical to health and vigor of a plant (Meays et al. 2000). Reducing the biomass of the wolfy plants would increase

[1] Animal Unit Month: The amount of forage necessary to sustain one cow or its equivalent for one month. A full AUM's fee is charged for each month of grazing by adult animals if the grazing animal: (1) is weaned, (2) is six months or older when entering public land, or (3) will become 12 months old during the period of use. For fee purposes, an AUM is the amount of forage used in one month by five weaned or adult sheep or goats or one cow, bull, steer, heifer, horse, or mule. The term AUM is commonly used in three ways: (1) stocking rate, as in X acres per AUM, (b) forage allocation, as in X AUMs in allotment A, and (3) utilization, as in X AUMs consumed from unit B.

their health and vigor by stimulating new growth that is more effective at photosynthesis and transpiration (Caldwell 1983).

The continued health and vigor of the crested wheatgrass is important because it is deep rooted and occupies the site, continues the hydrologic and nutrient cycling processes, and prevents annual invasive grass species such as cheatgrass and medusahead from invading and taking over the area. Annual invasive grass invasion is a serious ecological concern that affects rangeland health, wildfire behavior, wildlife habitat, and livestock grazing amongst other resources across the Great Basin.

Photo 1: Accumulation of biomass within crested wheatgrass stand in the Hammond Allotment. Photo taken July 10, 2018, in Webb Springs Pasture.

Purpose and need

The project is needed because livestock grazing rest since 2014 in the Hammond Allotment has allowed 5,800 acres of crested wheatgrass to accumulate standing biomass that has reduced the health and vigor of the stand. The standing biomass has also created additional risk of wildfire spread because of the amount and distribution of cured fine fuel.

The purpose of the project is to reduce standing biomass within the crested wheatgrass plants in order to increase their health and vigor and support continued ecological processes within the Hammond Allotment. Reducing the biomass within the crested wheatgrass seedings would also reduce the fine fuel accumulation, reduce fine fuel continuity, and reduce the risk of wildfire spread overall.

Decision to be made

Following this EA, the BLM will make a decision of either to authorize nonrenewable AUMs in the Hammond Allotment to reduce biomass accumulation in crested wheatgrass plants or take no action to resolve the accumulation of biomass within the crested wheatgrass plants.

Authorize nonrenewable livestock use: If the BLM decides to authorize nonrenewable AUMs, it would make additional decisions in the same decision record regarding:

- The amount and location of public land that could be used by the nonrenewable AUMs.
- The timing and season (length of time) the nonrenewable AUMs could be used.
- The number of years the nonrenewable use could be authorized.

Details are continued in chapter 2.

Scoping and issues

As the biomass in the crested wheatgrass stands in the Hammond Allotment has accumulated since 2014, there has been mounting interest locally to address the issue. The Harney County Court and Steens Landowners Working Group have both written letters to the Burns District Bureau of Land Management (BLM) expressing their concerns. Adjacent landowners and grazing permittees have also commented to the Burns District BLM about management of the crested wheatgrass seedings and made a call for reducing the standing biomass.

The public's concern has largely been due to the additional risk of large wildfires in the area as a result of fine fuel build up. There are scattered private lands with residences and associated structures within and near the Hammond Allotment. Because of the private property, this area would be a higher priority for suppression action should a fire occur. The public input to reduce the standing biomass is asking the BLM to consider proactive actions to not only reduce risk of

fire ignition and spread, but also to reduce fire intensity, which would create a safer situation should wildland fire fighters need to respond.

As a result of the public input, the BLM is considering alternatives in this environmental assessment (EA) that would simultaneously address the concerns about the health and vigor of the crested wheatgrass and the biomass (fine fuels) within the crested wheatgrass stands.

The BLM District Manager convened an interdisciplinary team (IDT) of specialists to consider input received and other available information (e.g., botanical evaluations of the site) and determine which issues warrant detailed consideration in this EA. The BLM considered the issues in the Alternatives section in chapter 2 of this EA.

Issues considered in detail in chapter 3

1. How would the level of livestock use under the alternatives affect the health and vigor of crested wheatgrass seedings?
2. How would the level of livestock use under the alternatives affect the achievement of Rangeland Health Standards 1 and 3?
3. How would livestock grazing change the characteristics of fine fuels to reduce wildfire spread?
4. How would the level of livestock use under the alternatives affect annual invasive grass?
5. How would the level of livestock use under the alternatives impact grassland obligate ground-nesting migratory birds?

The BLM considered several other issues during development of the EA, but did not analyze them in detail for a number of reasons, as summarized below. Additional details are in the project record and available from the BLM upon request.

Issues not considered in detail in chapter 3

1. The BLM considered whether **riparian areas** and **water quality** could be impacted by the project. Riparian areas and their associated streams are not accessible to livestock from the pastures where the nonrenewable grazing would take place. As a result, riparian areas were not considered in detail in chapter 3.
2. The BLM considered whether **cultural resources** could be impacted by the project. If cultural resource sites are located within existing livestock congregation areas, these sites have likely been affected during the last 100+ years of grazing. Possible effects are continued soil churning up to 12 inches deep, lateral and vertical movement of cultural materials, and artifact breakage. These effects are not significant because the site integrity has already been lost. Generalized grazing effects across the pastures by nonrenewable livestock use would not be measurable. Authorization of nonrenewable AUMs would not affect cultural sites within the Hammond Allotment because the pastures in question would not be grazed to a greater extent than allowable in the Andrews Management Unit (AMU)/Steens CMPA Resource Management Plans (RMP).

3. The BLM considered whether **botanical resources** could be impacted by project actions. The BLM conducted surveys for botanical resources, such as special status plants, including those on BLM lists as well as those designated as threatened or endangered in Oregon. No special status plant species were observed (Hammond Allotment Evaluation 2007, Hammond Permit Renewal (DOI-BLM-ORWA-B060-2019-003-CX) 2018). Therefore, the BLM does not expect the actions would have an effect on botanical resources, and the issue is not considered in detail in this EA.
4. The BLM considered whether **biological soil crusts** could be impacted by the project actions. The Oregon/Washington standards and guidelines (S&G) identified biological soil crusts as one of at least 12 potential indicators to be used in evaluating watershed function for uplands. The 2018 IDT, during the range assessments, searched for soil crusts and did not find many. This may be due to the complicated disturbance history of the area, historic improper grazing, and cultivation/herbicide preparation for planting crested wheatgrass in many of the allotment pastures that likely reduced biological soil crusts. Additionally, it is possible the high cover of grasses has suppressed soil crusts (TR-1730-2). Also, Davies and Bates in 2010 discussed that biological soil crusts do not appear to constitute a large portion of cover in either mountain or Wyoming big sagebrush plant communities in the northern Great Basin (the pre-disturbance plant community in the Hammond Allotment). Information on soil processes, as required by the S&Gs, is typically inferred from other monitoring information such as vegetative cover and density and litter cover. It can be assumed, in the absence of measurable and observable soil erosion and in the presence of healthy vegetative communities, soil processes are functioning correctly (AMU/Steens CMPA, RMP-23). There is no significant effect from any of the alternatives on biological soil crusts, therefore the low cover of biological soil crusts do not have an effect on achieving the Oregon/Washington S&Gs.
5. The BLM considered whether **recreation** could be impacted by the project. There is currently little public use on the project area. The majority of public use is to the west, on the Malheur Wildlife Refuge, or to the south on the North Steens Loop road. Walk in and driving access would continue to be available. None of the actions proposed in any of the alternatives would affect public access or recreational opportunities, including hunting access. Therefore, the issue is not considered in detail in this EA.
6. The BLM considered whether **wilderness study areas (WSA) and their values** would be impacted by the project. Effects to wilderness values in the Bridge Creek WSA were considered but not analyzed in detail. Proposed changes in grazing management practices include the use of nonrenewable livestock use. Livestock AUMs would be increased when there is an existing buildup of biomass (forage) or in favorable water years when available forage has exceeded normal water years. The temporary increase in AUMs meets the non-impairment standard because the increase is only available when those

conditions exist. The potential for new surface disturbances is mitigated by the wider availability of forage and water sources.

7. The BLM considered whether **wildlife** could be impacted by the project.
    a. The BLM completed wildlife surveys, habitat inventory and assessment, literature searches, and other research to determine which wildlife have habitat and are likely or not likely to be present in the project area. A summary of this is presented in appendix A. Where wildlife habitat is not likely it is not considered an issue to consider in detail in the EA.
    b. The project area provides habitat for and is occupied by **neotropical migratory birds.** The actions proposed in the alternatives could affect neotropical migratory birds and are analyzed in issue question 5.
    c. The project area is located in the northwestern-most contiguous portion of the **Greater Sage-Grouse** (*Centrocercus urophasianus*) habitat, also referred to as GRSG. According to the Oregon GRSG Approved RMP Amendment (ARMPA), the following table is the number of acres by designation type within the crested wheatgrass pastures of the Hammond Allotment.

Table 1. Acres of GRSG Habitat in Hammond Allotment per the Oregon GRSG ARMPA

Pasture Name	General Habitat Management Area (GHMA)	Priority Habitat Management Area (PHMA)	Acres of crested wheatgrass (not suitable for GRSG)
HOLE IN THE GRND #11	38	400	348
KNOX SPRING #5	0	2,534	2,117
LANDING STRIP #9	239	0	175
LARKSPUR RES #6	0	1,233	1,075
NORTH DUTCHOVEN #1	993	286	814
S DUTCHOVEN SEED #10	30	588	590
WEBB SPRINGS #4	0	1,565	708
Grand Total	**1,300**	**6,606**	**5,827**

There are no leks within the Hammond Allotment. Three GRSG leks occur within four miles southeast of the Hammond Allotment at 1 (occupied), 1.3 (unoccupied), and 2.3 (occupied) miles away respectively. The Hammond Allotment contains 6,606 acres of habitat designated as a PHMA associated with the Steens Priority Area of Conservation (PAC) and 1,300 acres designated as a GHMA. Most of the area identified as either PHMA or GHMA consist of crested wheatgrass seedings (see table 3 and map 3). Krumbo Creek, considered both PHMA and GHMA, is the only pasture within the allotment without crested wheatgrass seedings (see map 3) and is not proposed for nonrenewable grazing use.

Identification of PHMA or GMHA habitat relies on models that consider proximity to leks (Hagen 2011, Doherty et al. 2011) and concentrated use areas based on species home range (Hagen 2011, Warton 1989) but do not consider actual vegetative composition or structure within those areas. While the crested wheatgrass seedings would likely provide GRSG habitat in the future as native vegetation is re-established, these areas currently lack sagebrush structure and other vegetative components indicative of GRSG habitat and are therefore considered not suitable as GRSG habitat at this time and were not considered available GRSG habitat for this analysis. As it is expected that these areas have the potential to be habitat at some point in the future, their designation as GHMA or PMHA would be expected to remain unchanged. Monitoring and evaluation of these sites would continue, and acreage would be reincorporated as available PHMA and GMHA when re-established vegetation is adequate to provide seasonal habitat as appropriate.

In summary, although GRSG may travel through to access the meadows on the Malheur National Wildlife Refuge or higher elevation habitat on the Steens Mountain, it was determined the crested wheatgrass seeding pastures of the Hammond Allotment lack essential habitat requirements for vertical and horizontal cover because of the dominance of crested wheatgrass stands. The crested wheatgrass dominated pastures of the Hammond Allotment would have lacked these requirements regardless of what livestock grazing occurred. Actions proposed in this EA would, therefore, not have an effect on sage-grouse or their habitat. Consequently, the issue is not considered in detail in this EA.

8. The BLM considered whether **noxious weeds** could be impacted by the project. Inventory and treatment of noxious weeds is an ongoing process. The Hammond Allotment has limited occurrences of Canada and Scotch thistle, which have been treated and controlled and continue to be monitored. There are two Canada thistle sites, both along creeks inaccessible to livestock. There are three occurrences of Scotch thistle, two (including the largest site) of Scotch thistle are in Krumbo Creek pasture, which is not listed for nonrenewable AUM grazing. The third site is in the Larkspur Reservoir pasture. These sites were documented in the 2007 Hammond Allotment evaluation and considered controlled at that time. Livestock grazing, including nonrenewable use described in the proposed action, is still within the use level analyzed in the Andrews/Steens CMPA RMPs and would not compromise the plant community's ability to resist the invasion and spread of new occurrences. Furthermore, the sites continue to be monitored and controlled as needed by the Burns District weed program.

Chapter 2 Alternatives

Introduction

All acreage figures in this EA are best estimates based on available information and data, even when this is not noted in the text. For example, the number of acres to be grazed with nonrenewable AUMS in alternative 2 is listed as 5,800 acres, not as "approximately" 5,800 acres. The BLM used approximate numbers to enable analysis of effects based on currently available information.

The actions BLM is considering in this EA are summarized in table 1.

Alternatives considered in detail

Alternative 1 – No action

In this alternative, the BLM would take no action. The land would be grazed with the livestock for the same number of livestock and grazing season as on the 10-year grazing permit, which is April 1 to October 30 with 471 AUMs. The BLM would not authorize nonrenewable AUMs. The no action alternative is the only alternative that does not respond to the purpose and need for the action. The no action alternative provides a baseline for comparison of environmental effects (including cumulative effects) and demonstrates the consequences of not meeting the need for the action. The BLM is required to display the effects of no action.

Alternative 2 – Authorize nonrenewable AUMs (proposed action)

In this alternative, the BLM would authorize between 1,000 and 1,500 nonrenewable AUMs for use by cattle between March 1 to December 15 for the 2019 and 2020 grazing seasons. The nonrenewable AUMs would be used in conjunction with the 10-year grazing permit AUMs for the Hammond Allotment, which has a fixed season of April 1 to October 30 with 471 AUMs. The maximum total AUMS (10-year permit and nonrenewable added together) that could be used annually within the Hammond Allotment under this alternative would be 1,971.

The nonrenewable use would be flexible to meet the objective of reducing the biomass in the crested wheatgrass seedings, meaning the number of livestock and dates the livestock are in the pasture(s) may vary within the season-of-use dates. This is because studies, including those within Harney County, have shown that cattle interact with grazing crested wheatgrass differently by the grazing season. The summary of the studies is that crested wheatgrass growth is more palatable (more desirable to eat) in the spring (Hyder and Sneva 1963), while they are more likely to more evenly eat the residual growth (standing dead material) in the fall (Ganskopp and Bohnert 2004).

Utilization of the pastures would be consistent with the allowable use as stated in the AMU/ Steens CMPA RMPs, which is up to 60 percent utilization on non-native perennial bunchgrass

(crested wheatgrass). Where native vegetation is in the pastures, generally between the edges of crested wheatgrass seedings and the pasture fences, use would not exceed 50 percent on desirable perennial bunchgrasses regardless if it is 10-year grazing permit use or nonrenewable AUM livestock use. The target range of livestock utilization to increase the health and vigor of the crested wheatgrass and reduce fine fuels is between 40 percent[2] (AMU/Steens RMP Final Environmental Impact Statement (FEIS) page 4-185) and 60 percent, which is the maximum allowable use level directed by the RMP. The livestock would be removed if the allowable use is close to being exceeded, regardless of the date.

Nonrenewable use would be in 5,800 acres of crested wheatgrass seedings within the following pastures: Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs. These pastures are predominately crested wheatgrass seedings (see table 3) and pasture fences enable finer control by the permittee of the grazing use. The remainder of the pastures in the allotment that feature a higher percentage of native vegetation would continue to be used with the AUMs and schedule authorized with the 10-year grazing permit.

Livestock distribution across the pastures would rely on existing range developments, including water developments (ponds, pipeline, and trough systems) and fences between pastures and the allotment boundary. Routine maintenance and reconstruction (within the existing development footprint) is a term and condition of the 10-year grazing permit and is outside of this analysis, which is specific to nonrenewable AUMs. Livestock distribution may also be increased by strategic placement of salt, mineral, and protein supplements and active management by herding the cattle.

Use of nonrenewable AUMs for meeting resource objectives is specifically provided for in the AMU/Steens CMPA RMPs, including "reducing the quantity of standing, dead herbaceous material in nonnative seedings" (refer to pages 54 and 53 in the plans, respectively). Depending on the current year's grass production amount, reduction of biomass within the crested wheatgrass stands may take multiple grazing seasons to accomplish. Production would be monitored prior to turnout, and after livestock have left the pasture, to determine the effectiveness of the grazing in reducing crested wheatgrass biomass and consequently plan for the following grazing season. Determination of NEPA Adequacy (DNA) documentation would be completed on an annual grazing season basis after 2020 if the biomass within the crested wheatgrass warrants the continuation of authorizing nonrenewable AUMs.

[2] Forage quality could decline in nonnative seedings in areas where livestock utilization is measured at 40 percent or less (page 4-185 AMU/Steens CMPA FEIS)

Table 2. Summary of Alternatives.

	Alternative 1 – No action	Alternative 2 – Authorize nonrenewable AUMs
Nonrenewable AUMS authorized	Does not authorize nonrenewable AUMs; only uses permitted AUMs.	Authorize nonrenewable AUMs. Number of cattle and start and end dates of grazing would be determined by seasonal conditions within constraints described.
Season and amount of nonrenewable AUM livestock use	None	Between March 1 to December 15, not to exceed 1,500 nonrenewable AUMs total.
Number of years nonrenewable available	Not applicable	2019 and 2020. DNA required if action needed after 2020.

Alternatives considered but not analyzed in detail

The focus of the proposed action is to reduce the biomass of crested wheatgrass seedings in the Hammond Allotment to increase the health and vigor of the grass and reduce fine fuels that increase the risk of wildfire spread. Two additional alternatives were considered but are not analyzed in detail and are as follows:

Mechanical Mowing

An alternative to use mowers to mechanically clip crested wheatgrass was considered but not analyzed in detail because it would not meet the purpose and need and is technically infeasible. Mowers could be used to clip the crested wheatgrass, which would improve the health and vigor of the crested wheatgrass. However, mowing would turn the standing biomass within the "bunch" into excess litter at the soil surface, which then creates risk of wildfire spread by creating continuous fine fuels. Increasing continuous fine fuels would not meet the purpose and need to reduce fine fuel accumulations and continuity. Baling the mowed crested wheatgrass to remove this risk is technically infeasible given the limitations of the equipment commonly available to complete the task, paired with rocky, uneven, and difficult to access terrain.

Prescribed Fire

An alternative using prescribed fire to remove the standing biomass was considered but not analyzed in detail because it is technically infeasible and would not meet the purpose and need of the proposed action. The conditions in which crested wheatgrass burns successfully occur during the same timing as peak fire season. It is technically infeasible to implement this alternative because BLM cannot initiate prescribed burning under these conditions. Additionally, this alternative would not meet the purpose and need for action because fire could cause mortality in the crested wheatgrass plants due to their excess biomass, which would cause them to burn hotter and longer. Should the plants be killed, the site would then be open for invasive annual grass such as cheatgrass or medusahead to invade before the crested wheatgrass fully recovered. This

would not meet the purpose and need for action to improve vigor and health of the crested wheatgrass seedings.

Other ongoing and future actions

Ongoing actions the BLM plans to consider or implement in the project area that are not part of the alternatives include permitting livestock grazing and invasive plant inventory and treatment. There are no other reasonably foreseeable actions (projects) within the Hammond Allotment.

These ongoing actions would occur regardless of alternative. Each is described briefly, below.

1. **Livestock Grazing**
   As discussed in the Alternative section, the BLM permits livestock grazing in the allotment from April 1 to October 30 each year, rotated between all of the pastures within the Hammond Allotment. The effects of livestock grazing under a 10-year permit would affect actions proposed in the current EA (additional use in the form of nonrenewable AUMs); therefore, there would be a cumulative impact. However, with limiting the utilization level to what is allowed for and analyzed in the AMU/Steens CMPA RMP FEIS (page 4-179), findings in the Hammond Allotment Evaluation from 2007, and the updated S&Gs from 2018, there should not be additional effects than those analyzed in the AMU/Steens CMPA RMP FEIS. Maintenance and reconstruction of range developments would be ongoing in support of the 10-year grazing permit terms and conditions.

2. **Invasive Species Inventory and Treatments**
   Invasive species inventory is ongoing across the district with a focus on the Mud Creek and neighboring south side of Hammond Allotment in 2019 and 2020. There is an ongoing invasive species treatment program across the Burns District that includes aerial treatments (Integrated Invasive Plant Management for the Burns District Revised EA (DOI-BLM-OR-B000-2011-0041-EA)). Aerial treatment of medusahead in the neighboring Mud Creek Allotment is slated for 2019 or 2020. Treatment of the medusahead in the Mud Creek Allotment may reduce the seed source along the southern boundary of the Knox Springs pasture. Livestock grazing on crested wheatgrass seedings in the same area at the moderate use level would increase the health and vigor of the crested wheatgrass seeding to help it resist the establishment and spread of medusahead (issue question 4 analysis in this EA). Treatments in the Mud Creek Allotment would not lead to cumulative effects to the Hammond Allotment because it is outside the allotment boundary (see more discussion under Cumulative Effects section of issue question 4).

Conformance of alternatives with policy

The actions proposed in the alternatives would be in conformance with the land use plan that directs management of public land in this area, the 2005 AMU RMP, and 2005 Steens CMPA RMP and subsequent amendments to this plan, including the Oregon GRSG ARMPA (USDI 2015). The proposed action conforms to RMP direction for livestock grazing, vegetation, wildlife, and invasive species, as described below and illustrated with citations from the RMP.

Livestock grazing

- Manage for a sustained level of livestock grazing while maintaining healthy public land resources. Provide for a sustained level of livestock grazing in the CMPA, while meeting resource objectives and requirements for the S&Gs.[3] Implement administrative solutions and rangeland projects to provide proper management for livestock grazing while meeting resource objectives and requirements for S&Gs (USDI 1997) (Grazing Management, RMP-53).
- Objective LG 1: Manage livestock grazing to maintain or improve Greater Sage-grouse habitat by achieving Standards for Rangeland Health (Oregon GRSG ARMPA, 2-17).

Vegetation

- Maintain, restore, or improve the integrity of desirable vegetation communities including perennial, native, and desirable introduced plant species. Provide for their continued existence and normal function in nutrient, water, and energy cycles. Maintain or restore native vegetation communities through sound landscape management practices. Manage desirable nonnative seedings to meet resource objectives (Rangelands, RMP-30).
- Goal Veg 1: Increase the resistance of Greater Sage-grouse habitat to invasive annual grasses and the resiliency of Greater Sage-grouse habitat to disturbances such as fire and climate change to reduce habitat loss and fragmentation. (Oregon GRSG ARMPA, 2-10).

Wildlife

- Provide diverse, structured, resilient, and connected habitat on a landscape level to support viable and sustainable populations of wildlife, fish, and other aquatic organisms. Maintain, restore, or improve habitat. Manage forage production to support wildlife population levels identified by the Oregon Department of Fish and Wildlife (ODFW) (Fish and Wildlife, RMP-33).

Invasive species

- Control the introduction and proliferation of noxious weeds, and reduce the extent and density of established populations to acceptable levels. Treat noxious weeds and inventory for new infestations using the most effective means available, as outlined in the

[3] The Code of Federal Regulations at 43 CFR § 4180.1 directs BLM to manage public lands to provide that, "(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities." Establishing compliance with the Fundamentals of Range Health section of the regulation is further defined in the Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Oregon/Washington BLM adopted August 12, 1997, which will be referred to as the "standards" or "guidelines" or together as "S&Gs."

Burns District's Integrated Management Program EA/Decision Record (DR) (Noxious Weeds, RMP-32).

The following management objectives, **specific to the Hammond Allotment**, are from the AMU/Steens Mountain CMPA RMP/ROD, Appendix J - Allotment Management Summaries, J-27, as amended by the 2015 Oregon GRSG ARMPA/ROD:

- Improve the ecological condition of upland vegetation communities.
- Maintain the ecological condition of upland vegetation communities.

The proposed action has been designed to conform to the following documents that direct and provide the framework for management of BLM lands within Burns District—

- Taylor Grazing Act (43 U.S.C. 315), 1934;
- The National Environmental Policy Act (NEPA) (42 U.S.C. 4320–4347), 1970;
- Federal Land Policy Management Act (FLPMA) (43 U.S.C. 1701), 1976, as amended;
- Steens Mountain Cooperative Management and Protection Act of 2000;
- Public Rangelands Improvement Act (43 U.S.C. 1901), 1978;
- National Historic Preservation Act (16 U.S.C. 470 et seq.), 1966;
- S&Gs for Public Lands Administered by the BLM in the States of Oregon and Washington, August 12, 1997;
- Integrated Invasive Plant Management for the Burns District Revised EA (DOI-BLM-OR-B000-2011-0041-EA), 2015;
- State, local, and tribal laws, regulations, and land use plans; and
- All other Federal laws that are relevant to this document, even if not specifically identified.

Chapter 3 Affected Environment and Environmental Effects

Issue: How would the level of livestock use under alternative 2 affect the health and vigor of crested wheatgrass seedings?

Affected environment

Crested Wheatgrass and the Response to Livestock Grazing

As an introduced nonnative species crested wheatgrass (*Agropyron cristatum* (or in the past known as *A. desertorum*)) interacts with livestock grazing differently than the other native, deep-rooted perennial bunchgrasses, within the Hammond Allotment as well as across the Great Basin. Crested wheatgrass originated in Eurasia and likely evolved in its native environment under heavy grazing by large groups of ungulates (Meays et al. 2000). Crested wheatgrass has been widely investigated and is known for being persistent, vigorous, and tolerant to drought and livestock grazing. These qualities made it a favorite for seeding semiarid rangelands (Hyder and Sneva 1963) that were in poor condition after decades of improper grazing in the 1800s and early 1900s, and where spring grazing opportunities were scarce. D.W. Hedrick in 1967 held "Perhaps

the greatest benefit (of having crested wheatgrass to graze in the spring) has been an indirect one in the later spring and summer feed in the upper foothills of the Steens Mountains. Grazing crested wheatgrass during this crucial early spring period has deferred turnout on the native species with a resulting boost in their stand and production."

When compared to bluebunch wheatgrass (*Psuedoroegneria spicata*), a native deep rooted bunchgrass present within the Hammond Allotment, crested wheatgrass puts more effort in producing biomass in the form of leaves. Studies have shown that crested wheatgrass has up to 50 percent more green foliage than bluebunch wheatgrass in the same growing environment (Caldwell et al. 1983). Over time, with successive growing seasons, the leaves and stems of crested wheatgrass die and accumulate in the base of the grass plant, which creates a light limited or "self-shading" situation. When self-shading occurs, the photosynthesis of the plant is decreased. Maintenance of high photosynthetic rates is critical to the health and vigor of a plant especially during the time of year when water and nutrients are plentiful (Meays et al. 2000). Livestock can decrease the amount of self-shading occurring by reducing the previous year biomass and current year growth by consuming this material. When this was tested by removing 60–85 percent of the green foliage, the result was a more favorable photosynthetic to transpiration ratio (P:T ratio) (Caldwell et al. 1983). A favorable P:T ratio allows the crested wheatgrass to quickly reestablish leaves to maintain photosynthesis for the production of subsequent roots, stems, and leaves. Another measure of health and vigor is evidence of reproduction; crested wheatgrass reproduces vegetatively (tillering) and by seed.

Definition: Plant Vigor

Relates to the relative robustness of a plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant and its parts in relation to its age and the environment in which it is growing.

Society for Range Management. 1998. Glossary of terms used in range management, fourth edition.

Crested Wheatgrass Response to Livestock Grazing by Grazing Season

The response of the crested wheatgrass seedings to livestock grazing also varies by the season in which they are grazed. Moderate spring and fall livestock use (40–60 percent utilization) can be used to reduce standing biomass within the crested wheatgrass seedings without having negative impacts to the plants. A summary of studies on crested wheatgrass grazed annually in the spring (April–end of June) by livestock conducted between the 1940s and 1970s found that average utilization between 65–70 percent either maintained or improved crested wheatgrass production (Laycock and Conrad 1981, Frischknect and Harris 1968). Fall use of cool season grasses (such as crested wheatgrass) when plants are dormant can be heavier than during the growth period (spring) as the removal of dead material has little direct effect on the plant (Trlica 2013). Furthermore, local studies suggest that uniform utilization of wolf plants would be best accomplished if grazing occurs after standing forage has cured (Ganskopp et al. 2004).

Photo 2: Photo of crested wheatgrass in South Dutch Oven Pasture in June 2008 after consistent moderate spring grazing. This is what the crested wheatgrass stands looks like without a biomass accumulation.

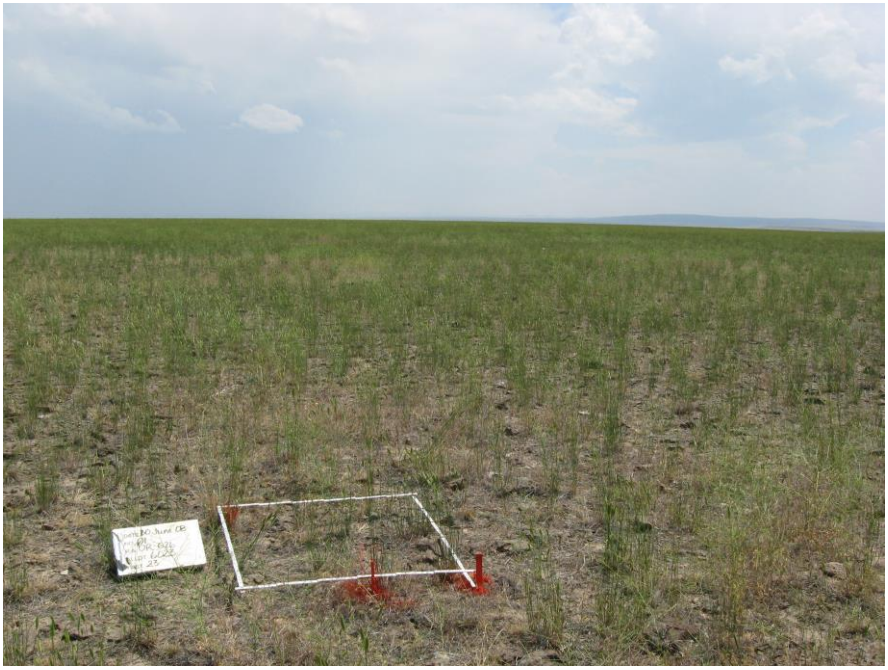
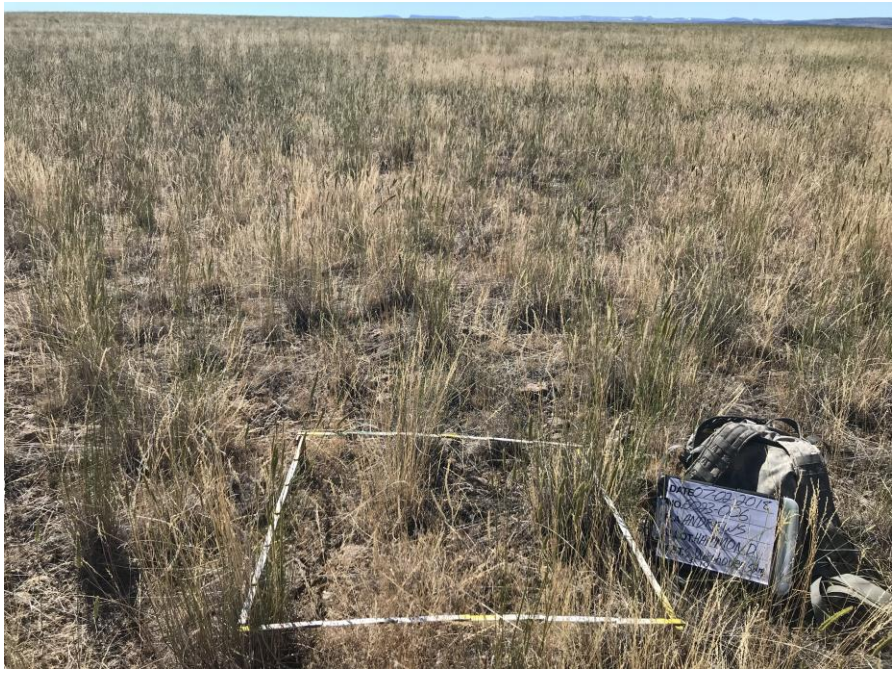


Photo 3: Photo of crested wheatgrass in South Dutch Oven in June 2018, rested since 2014.



Assumptions and methodology

The proposed action calls for moderate livestock utilization of crested wheatgrass, which is between 40 and 60 percent by weight. Although studies vary greatly on how utilization is classified, for the purposes of this document and analysis specific to crested wheatgrass, *light use is 40 percent or less, moderate 41–65 percent, and heavy 65 percent or greater*. Protocols from BLM Technical Reference 1734-03, titled Utilization Studies and Residual Measurements, would be used to determine livestock use during, after, and before grazing (this may be the case in determining if fall use is needed to meet the target utilization).

Another assumption that has been referred to is that pastures are predominately crested wheatgrass. Table 3 demonstrates the acreage of crested wheatgrass by pasture.

Table 3. Acres of Crested Wheatgrass Seedings per Pasture for Proposed NR AUM Livestock Use.

Pasture Name	Acres Crested Wheatgrass	BLM Acres within Pasture	% of Pasture Crested Wheatgrass
HOLE IN THE GRND #11	348	437	80
KNOX SPRING #5	2,117	2,492	85
LANDING STRIP #9	175	237	74
LARKSPUR RES #6	1,075	1,242	87
NORTH DUTCHOVEN #1	814	1,197	68
S DUTCHOVEN SEED #10	590	590	100
WEBB SPRINGS*	708	1,549	45
Grand Total	**5,827**	**7,744**	**75**

*Nonrenewable AUMs would be for the west side of the pasture where the crested wheatgrass dominates.

Effects

Alternative 1

This is the no action alternative, where grazing as described on the 10-year grazing permit would continue from April 1 to October 30 with 471 AUMs. Crested wheatgrass seedings in the allotment, specifically in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures would receive overall light utilization by livestock. The direct effect would be that biomass would continue to accumulate within the crested wheatgrass bunches and wolfy plants would persist. The indirect effect would be that crested wheatgrass would continue to self-shade and be less vigorous because photosynthesis and transpiration are at a reduced level. Less vigorous or decadent crested wheatgrass would create openings in the site and increase the likelihood that invasive species could invade. Moderate utilization may occur near congregation areas, such as water developments, but would be limited to those areas.

Alternative 2

Alternative 2 would authorize between 1,000 and 1,500 nonrenewable AUMs of livestock grazing on crested wheatgrass seedings within the Hammond Allotment, specifically in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures that are predominantly crested wheatgrass seedings. Additional livestock use, for more time than what is authorized by the 10-year grazing permit, would directly affect crested wheatgrass by removing biomass to the moderate utilization level (40–60 percent) target within the next two grazing seasons. A moderate utilization level would indirectly affect crested wheatgrass by stimulating grass regrowth of leaves, stems, and roots, which would have more photosynthetic and transpiration capability, and ultimately contributing to a boost in health and vigor of the grass (photos 2 and 3). Increasing the vigor of the crested wheatgrass would keep the site occupied by the deep-rooted perennial bunchgrass and increase the ability of the site to resist invasive species. Having the ability to use livestock grazing in the spring with a follow-up graze period in the fall, as needed, would result in most uniform achievement of the target utilization on the crested wheatgrass (40 to 60 percent use) and best respond to the purpose and need for action.

Cumulative effects

There are no known reasonably foreseeable projects in the Hammond Allotment.

Grazing by nonrenewable AUMs is considered in the effects analysis for this issue question and does consider the ongoing 10-year grazing permit use under alternative 2. Furthermore, the utilization level is not to exceed that which was analyzed in the AMU/Steens CMPA RMP FEIS. Therefore, grazing effects to crested wheatgrass from the 10-year grazing permit would combine with grazing effects of nonrenewable use; however, they would not produce a greater cumulative effect than the direct and indirect effects already described above.

Issue: How would the level of livestock use under alternative 2 affect the achievement of Rangeland Health Standards 1 (Watershed – Upland) and 3 (Ecosystem Processes)?

Affected environment

Hammond Allotment Ecological Setting

The ecological sites[4] within the Hammond Allotment follow a consistent pattern across the pastures where the nonrenewable grazing would occur (see map 3). The Hammond Allotment is bounded on the west by the Malheur National Wildlife Refuge meadows. As the topography in the allotment rises in elevation 800 feet from west to east (towards the Steens Mountain), the soils transition from loamy to soils with a higher clay content. The precipitation increases from

[4]Ecological sites are defined as a distinctive kind of land with specific soil and physical characteristics that differ from other kinds of land in its ability to produce a distinctive kind and amount of vegetation and its ability to respond similarly to management actions and natural disturbances.

10 inches at the lowest point to up to 16 inches at the highest point. Since the ecological sites function similarly and have been planted to crested wheatgrass across this range, the effects from livestock use to the crested wheatgrass seedings are expected to be similar. Ecological site information (summarized in an ecological site description[5]) is the basis for comparison when completing range assessments (Interpreting Indicators for Rangeland Health, TR-1736-6, 2006, version 4) that in turn support S&G determinations, along with other sources of information and data.

Evaluation of Hammond Allotment in 1993

The initial grazing evaluation covering the Hammond Allotment was completed in 1993. The 1993 grazing evaluation preceded the 43 CFR 4180 Fundamentals of Rangeland Health regulations and the resulting Oregon/Washington S&Gs, so conditions were rated differently than they would be today. The 1993 results for the North Dutch Oven, Webb Springs, Knox Springs, and Larkspur Reservoir pastures were rated in "Excellent Seeding" condition, while the Landing Strip and Hole in the Ground pastures were rated in "Excellent/Good Seeding" condition (2007 Hammond Allotment Evaluation, page 6). The management objectives for all of the pastures listed was to "maintain" them. The 2007 evaluation looked back to review the upland 1993 objectives and determined they had been met.

Evaluation of Hammond Allotment from 1993 to 2007

The 2007 evaluation incorporated the Fundamentals of Rangeland Health and Oregon Washington S&Gs into the process. The livestock grazing between 1993 and 2007 included the 10-year grazing permit (473 AUMs) as well as nonrenewable AUMs (averaged 943 over that period). Livestock use during that time hit the target use range of the proposed action for this project (40–60 percent use on crested wheatgrass) approximately 76 percent of the time (Hammond Evaluation 2007, pages 7–8). The grazing use during that time rarely exceeded the target level of 60 percent use on crested wheatgrass (Hammond Allotment Evaluation 2007, pages 7–8). None of the exceeded use was over 70 percent, which studies support is still a level of use that maintains or improves crested wheatgrass stands (see Issue Question 1, Affected Environment). In 2007 the Standards for Rangeland Health Determination for the Hammond Allotment documented that Standards 1 and 3 were achieved, indicating that the use on the crested wheatgrass had been appropriate to maintain upland watershed (soil) function and ecological process. Grazing using both the 10-year permitted use and nonrenewable use continued through the 2012 grazing season.

Evaluation of Hammond Allotment 2007–2018

In 2018, the Hammond Allotment was assessed by an IDT using the Interpreting Indicator for Rangeland Health (IIRH) protocol to inform conformance to Oregon Washington S&Gs. The S&G determination found that Standards 1 and 3 were achieved in the Hammond Allotment (2018 Hammond Allotment S&G Determination). Standards 1 and 3 were achieved because the

[5] For a full description of what ecological sites descriptions are, refer to the National Resource Conservation Service website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/ecoscience/desc/.

review of the 17 indicators of rangeland health indicated that the sites were functioning in regards to soil/site stability, hydrologic function, and biotic integrity attributes when compared to the reference condition for the ecological site being rated (for a list of ecological sites by pasture refer to appendix C). There was one notable departure from the reference condition under the biotic integrity attribute, which was the conversion of the vegetation community from sagebrush to crested wheatgrass. The Oregon Washington S&Gs allow for this under Standard 3 by stating, "While emphasis may be on native species, an ecological site may be capable of supporting a number of native and introduced plant and animal populations and communities while meeting this standard". The summary of the IIRH assessment and the rationale for determination by standard is as follows:

Standard 1

Bare ground throughout the allotment matches what is expected for the reference state.[6] The allotment is primarily a crested wheatgrass seeding. Some shrubs are present within seeded areas. However, the percent of shrubs is below the ecological site description (ESD). With the lack of the shrub component competing for resources, grass and forb production have increased filling the interspaces. During the 2018 Indicators of Rangeland Health Assessment, it was found that the soil and site stability related indicators typically showed no departure from reference. These upland soils are exhibiting infiltration and appropriate permeability rates, storing available moisture, and showing little to no sign of erosion. Recent drought conditions may have potentially limited water erosion on the site. However, fall, winter, and spring of 2016/2017 were wetter than normal, with no evidence of erosion. Precipitation the site is receiving appears to be being captured and stored properly. There are no signs of rills, gullies, or water flow patterns. The upland soils in this allotment are supporting deep-rooted perennial vegetation. The dominant (40–60 percent plant composition) species present throughout the allotment is crested wheatgrass. Other native grasses that are found within the allotment include Sandberg's bluegrass and Thurber's needlegrass as minor (2–10 percent plant composition) components, with Idaho fescue and bluebunch wheatgrass being found in trace (<2 percent plant composition) amounts. These species are part of the reference community. The abundance of bluebunch wheatgrass and sagebrush on this site is much lower than is expected of a reference community, which is common of crested wheatgrass seedings that have historically been managed as crested seedings and continue to be managed as seedings. Also present throughout the allotment is cheatgrass, which exists at levels from common to trace depending on the disturbance the area has received. Areas of cheatgrass are limited but are widespread throughout the allotment.

Indicators used include amount and distribution of plant cover, litter, bare ground, and rock; plant composition and community structure; biological activity; and signs of erosion and overland flow. Monitoring data used in the determination were long-term trend monitoring (Pace

[6] Reference state: The reference state is the state where the functional capacities represented by soil/site stability, hydrologic function, and biotic integrity are performing at an optimum level under the natural disturbance regime. This state usually includes, but is not limited to, what is often referred to as the potential natural plant community (PNC). The reference state is what is used to determine departure from expected and is documented on the reference sheet.

180 and photo points), Indicators of Rangeland Health assessments, and professional observations.

Standard 3

Reference state for the majority of this allotment is either Wyoming big sage with deep-rooted perennial grasses, or low sagebrush with deep-rooted perennial grasses. The sagebrush component has been greatly reduced, with an increase in herbaceous production (crested wheatgrass). Crested wheatgrass is a deep-rooted perennial that provides site stability.

Based on the ESD, composition on this site should be approximately 60–80 percent grasses, 5–10 percent forbs, and 15–30 percent shrubs. Monitoring has found the site ranges from 97–100 percent grasses, 1–2 percent forbs, and 0–1 percent shrubs. Composition differs from ESD because Hammond Allotment is a crested wheatgrass seeding. This allotment has historically been managed as a seeding and continues to be managed as a seeding. Nutrient cycling is occurring effectively as evidenced by plant composition and biological activity including plant growth.

Indicators used: Plant composition and community structure; accumulation, distribution, and incorporation of plant litter and organic matter into the soil; and root occupancy in the soil profile. Monitoring data used in the determination were long-term trend monitoring (Pace 180 and photo points), Indicators of Rangeland Health assessments, and professional observations.

Assumptions and methodology

The assumption is that because Standards 1 and 3 were achieved in the 2007 and 2018 Hammond Allotment determinations under the same level livestock use authorized under the 10-year permit combined with nonrenewable use from 1993–2012, that Standards 1 and 3 would continue to be achieved under the management described in alternative 2.

Effects

Alternative 1

This is the no action alternative, where grazing as described on the 10-year grazing permit would continue from April 1 to October 30 with 471 AUMs. Crested wheatgrass seedings in the allotment, particularly in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures would receive overall light utilization by livestock. In the short term (1–5 years) Standards 1 and 3 would continue to be achieved. In the long term (5–10 years), if the biomass in the crested wheatgrass continues to accumulate, the direct effect is the reduction of vigor of the crested wheatgrass plants (because of too much standing biomass) and resulting litter that could be in excess of what is expected for the reference condition. Stagnant crested wheatgrass plants and excess litter could impact nutrient cycling negatively, indirectly effecting the achievement of Standard 3. Standard 1 would be negatively affected indirectly if crested wheatgrass plants

started becoming decadent, because deep-rooted perennial bunchgrasses function to stabilize soils.

Alternative 2

Alternative 2 would authorize between 1,000 and 1,500 nonrenewable AUMs of livestock grazing on crested wheatgrass seedings within the Hammond Allotment, specifically in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures that are predominantly crested wheatgrass seedings. Past management records (1993–2012) show that additional livestock for additional time than what is authorized by the 10-year grazing permit would reliably remove biomass to the moderate utilization level (40–60 percent) target. Grazing to the moderate utilization level on crested wheatgrass would increase the vigor of the plants and reduce standing biomass that could otherwise become excess litter. The direct effect would be short-term maintenance, and long-term improvement to nutrient cycling contributing to the conditions needed to achieve Standards 1 and 3. Furthermore, studies conducted in Harney County have shown that spring grazing of crested wheatgrass may create an opportunity for native species such as sagebrush to re-enter the crested wheatgrass seedings more than a non-grazed seeding (Nafus 2015). An increase in native species would have a positive effect to Standard 3. Standard 1 would be positively affected indirectly because healthy deep-rooted perennial bunchgrass, such as crested wheatgrass, functions to stabilize soils.

Cumulative effects

There are no known reasonably foreseeable projects in the Hammond Allotment.

Grazing by nonrenewable AUMs is considered in the effects analysis for this issue question and does consider the ongoing 10-year grazing permit use under alternative 2. There should be no additional negative cumulative effects of the 10-year grazing permit use and nonrenewable use to Standards 1 and 3 because the timing, number of animals, and utilization level have been implemented in the past with a record of standard achievement.

Issue: How would livestock grazing change the characteristics of fine fuels to reduce wildfire spread?

Affected environment

Currently there is a five-year accumulation of biomass within the crested wheatgrass seedings in the Hammond Allotment. Because much of the allotment was converted from sagebrush to crested wheatgrass, the herbaceaous (grass) production dramatically increased in the absence of competition for resources from shrubs. Without an influence to reduce the biomass (examples are wildfire, livestock grazing, grasshopper infestation), it has accumulated to the point it is continuous across the whole area including the interspaces between grass plants (see photo 4 close-up and photo 3 distance view). Should an ignition source present itself, naturally by lightning or human caused, the crested wheatgrass seedings would readily burn because the fine

fuel is cured and continuously available to keep fire spreading. Standing dead plant material (less than 0.25 inch diameter) extends the fire season; since it is not in contact with the ground it dries out more quickly, is ready to ignite, and sustains combustion better than other available fuels. Recent large wildfires (100,000 acres and larger) in Harney County and Southeast Oregon (Miller Homestead 2012, Holloway 2012, and Buzzard 2014) have been where this situation has played out and have created an awareness amongst the local community to encourage BLM to manage for fine fuels. These extremely large wildfires burned similar vegetation and ultimately consumed over 1,000,000 acres of rangelands and GRSG habitat.

Photo 4. Close up of accumulation of fine fuels in crested wheatgrass in North Dutch Oven Pasture in 2018.

The Harney County Court and local community members have contacted the BLM and expressed their concern with fire risk in this area. Because of the interest by the public, and other management considerations such as the threat to GRSG habitat by wildfires, recent studies have been conducted that look at the way livestock influence fuel characteristics in the Great Basin (Davies et al. 2015, Davies et al. 2017). Two studies looked at the season of use of livestock grazing and its influence on fuel characteristics, one study focused on spring and fall use, the other winter use. The spring and fall livestock grazing study looked at the probability of fire propagation, meaning the ability of the fire to get started and get large. The winter study looked at using livestock as a fuel treatment to reduce the likelihood of fire spread and fire severity.

Wildfire season is variable from year to year but, in general, for this area it is from mid-June through the end of August. The main finding of the grazing studies was that grazing in any season[7] increased fuel moisture by reducing the amount of dead (cured) fuels in the bunchgrasses, therefore increasing the live:dead material ratio. Live material has more moisture than dead material does, thus increasing the live:dead ratio reduces the ignition potential and amount of initial fire spread early in the fire season. Overall, spring grazing would be the most effective at creating lasting effects later into the fire season by decreasing fine fuel height, biomass, and fine fuel continuity because it affects current year growth as well as past years' growth. Both fall and winter grazing increase the live:dead material ratio going into the following growing season. In either study, the emphasis was on using grazing to influence fuel characteristics after a high herbaceous production year or where there is a buildup of biomass.

Assumptions and methodology

Although the studies investigating livestock grazing influence on fuel characteristics were conducted on native range, the information is still relevant because it was conducted within the vicinity of the project area with similar livestock utilization levels as proposed, they found no livestock use on sagebrush, and the measurements were taken on deep-rooted perennial bunchgrasses. A comparison of the studies is in table 4 below. By using a target utilization rate of 40–60 percent on crested wheatgrass, the assumption is there would be a similar impact to fuels characteristics of the crested wheatgrass seedings in the Hammond Allotment as in the grazing studies.

[7] The studies defined grazing seasons as: Spring (May–June), Fall (September), and Winter (November–early April).

Table 4. Comparison of Fuel Characteristics by Grazing Season (Davies et al. 2015 and 2017)

Herbaceous (Grass) Fuel Characteristics	Control (Ungrazed)	Spring (May/June)	Fall (September)	Winter (November–April)
		Cattle Utilization 40–50%		Cattle Utilization 40–60%
Fuel moisture	Baseline	By July: 1.6–1.9 times more moisture By August: 2.0–2.2 times more moisture than control	Not measured	2.1–2.3 times more moisture than control mean of June, July, August measurement
Fuel cover	Baseline	170% less	140% less	140% less
Fuel continuity	Baseline	1.5 times less than control	No difference with control	1.4 times less than control
Biomass	Baseline	Reduced 66%	Reduced 49%	Reduced 58%
Probability of ignition	Baseline	Reduced by 170–220%	Reduced by 170–220%	Not measured
Probability of bunchgrass burning	Baseline	200% less likely to burn	No difference from control	Not measured
Initial fire spread	Baseline	Greatest reduction in spread probability	Much less probability than control in July, difference with control washes out by August	Not measured

Effects

Alternative 1

This is the no action alternative, where grazing as described on the 10-year grazing permit would continue from April 1 to October 30 with 471 AUMs. Crested wheatgrass seedings in the allotment, particularly in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures would receive light utilization by livestock. The direct effect of light utilization on the crested wheatgrass would result in an inconsistent reduction in the live:dead ratio for fine fuels. Utilization around areas where livestock congregate, such as water developments, would be higher and provide some reduction in fuel continuity in localized areas. Indirectly light utilization would provide inconsistent biomass removal and fuel moistures, resulting in areas within the pastures that would be primed to burn should an ignition source occur. In the long term, when vigor of the crested wheatgrass is reduced, the proportion of green stems decreases within the bunch. When the proportion of dead to living stems is too high, that can moderate the effects of the green plant material, and it is no longer enough to retard ignition or fire spread.

Alternative 2

Alternative 2 would authorize between 1,000 and 1,500 nonrenewable AUMs of livestock grazing on crested wheatgrass seedings within the Hammond Allotment, specifically in the Hole

in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures that are predominantly crested wheatgrass seedings. Past management records (1993–2012) show that additional livestock for additional time than what is authorized by the 10-year grazing permit would reliably remove biomass to the moderate utilization level (40–60 percent) target. The direct effect would be to remove biomass from the crested wheatgrass plants to increase the live:dead ratio across the pastures and, at the same time, decrease fuel continuity. The indirect effect would be to increase the fuel moisture of the crested wheatgrass stands, thereby shortening the effective fire season, and reduce the likelihood of fire spread should an ignition occur.

Cumulative effects

There are no known reasonably foreseeable projects in the Hammond Allotment.

Grazing by nonrenewable AUMs is considered in the effects analysis for this issue question and does include and consider the ongoing 10-year grazing permit use under alternative 2. There should be no negative cumulative impacts as a result of managing fine fuels described under alternative 2 because the grazing proposed has been implemented in the past with a record of Standards 1 and 3 achievement. There would be a positive cumulative impact to the soils and vegetation within the allotment and outside of the allotment if catastrophic wildfire ignition was avoided or wildfire spread reduced by the proposed action. Quantifying this impact is speculative; however, it is generally accepted that catastrophic wildfire can have short- and long-term negative impacts to soils and vegetation depending on how severe the intensity of the wildfire gets.

Issue: How would the level of livestock use under alternative 2 affect invasive annual grass?

Affected environment

Cheatgrass (*Bromus tectorum*) is an annual invasive grass that does occur in small areas, yet consistently distributed across the Hammond Allotment (2018 Hammond Allotment S&Gs). Cheatgrass is a management concern because it competes with desirable native vegetation for resources such as nutrients and water and can invade and overtake a rangeland, leading to increased soil erosion, decreased vegetative productivity, and decline in habitat values for wildlife. Crested wheatgrass is one of the few species that is able to out-compete undesirable annuals such as cheatgrass (Arredondo et al. 1998). If established in an annual grass invaded site, crested wheatgrass can stabilize the soil and hinder further exotic annual grass invasion (Davies et al. 2010b; Davies et al. 2015). Therefore, managing for the health and vigor of crested wheatgrass within the Hammond Allotment would be the most effective way to manage against cheatgrass establishment and spread. Moderate spring utilization on crested wheatgrass by livestock has shown to maintain or increase their productivity as discussed in the Affected environment section under Issue Question 1 in this EA. Moderate winter livestock use on crested

wheatgrass found no difference in annual grass biomass between grazed and ungrazed areas (Davies et al. 2017).

Assumptions and methodology

Ongoing inventories of invasive annual grasses would be conducted to continue to build the knowledge base on cheatgrass occurrences within the allotment. Current information demonstrates that cheatgrass is mainly in disturbed areas, particularly roadsides.

Effects

Alternative 1

Grazing, as described on the 10-year grazing permit, would continue from April 1 to October 30 with 471 AUMs. Crested wheatgrass seedings in the allotment, particularly in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures, would receive light utilization by livestock. There would be little to no direct or indirect effect to cheatgrass under this alternative in the short term (1–5 years). In the long term (5+ years), if the crested wheatgrass continues to accumulate biomass and experience reduction in vigor and decadence, cheatgrass may be able to spread in those areas. Due to the ongoing 10-year grazing permit use, moderate livestock use would continue to occur around livestock congregation areas, such as water developments, thus maintaining crested wheatgrass health to compete with annual invasive grass such as cheatgrass.

Alternative 2

Alternative 2 would authorize between 1,000 and 1,500 nonrenewable AUMs of livestock grazing on crested wheatgrass seedings within the Hammond Allotment, specifically in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures that are predominantly crested wheatgrass seedings. Past management records (1993–2012) show that additional livestock for additional time than what is authorized by the 10-year grazing permit, would reliably remove biomass to the moderate utilization level (40–60 percent) target. Moderate use on crested wheatgrass would directly affect the plant by reducing biomass, and allowing the plant to perform vital functions such as photosynthesis and transpiration more effectively. The indirect effect would be a healthy and vigorous crested wheatgrass stand that would be able to compete with cheatgrass where it is present, and prevent the establishment and spread of cheatgrass in other areas.

Cumulative effects

There are no known reasonably foreseeable projects within the Hammond Allotment.

Grazing by nonrenewable AUMs is considered in the effects analysis for this issue question and does include and consider the ongoing 10-year grazing permit use under alternative 2. There

should be no negative cumulative impacts as a result of additional nonrenewable AUMs in the allotment because livestock grazing would increase the health and vigor of crested wheatgrass that would provide effective competition with cheatgrass. That competition from crested wheatgrass with cheatgrass would serve to reduce its establishment and spread.

In the neighboring allotment, the Mud Creek Allotment, aerial treatment of medusahead in 2019 or 2020 could contribute a long-term positive effect to the Hammond Allotment by reducing a medusahead seed source from the south. Moderate livestock grazing of the crested wheatgrass seedings along the southern allotment boundary in the Knox Springs pasture could create a positive cumulative effect by maintaining the health and vigor of the crested wheatgrass stand, therefore making it more effective at resisting establishment and spread of annual invasive grasses such as medusahead.

Issue: How would the level of livestock use under the alternatives impact grassland obligate ground nesting migratory birds?

Affected environment

The Migratory Bird Treaty Act of 1918 identifies migratory birds regardless of their status as common or rare. Breeding bird surveys conducted in the vicinity of the allotment show a stable trend in species richness and abundance with changes to species composition occurring in response to crested wheatgrass seedings and wildfires. This has resulted in an increase of species favoring grassland habitats and a subsequent decrease in shrubland adapted species (USGS 2017). Common migratory birds observed or expected to occur in the area based on available habitat in a given area include Western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), Brewer's blackbird (*Euphagus cyanocephalus*), red-tailed hawk (*Buteo jamaicensis*), cliff swallow (*Petrochelidon pyrrhonota*), savannah sparrow (*Passerculus sandwichensis*), gray flycatcher (*Empidonax wrightii*), common raven (*Corvus corax),* vesper sparrow (*Pooecetes gramineus*), Brewer's sparrow (*Spizella breweri*), and sage thrasher (*Oreoscoptes montanus*).

Nesting, foraging, and roosting habitat for migratory birds occurs in scattered patches alongside crested wheatgrass seedings throughout the allotment. Available habitat located within the area includes sagebrush steppe, aspen stands, willow and other deciduous shrubs, cliff bands, ponds/reservoirs, juniper woodlands, and both native and nonnative perennial bunchgrasses. Past and present actions that have led to the current conditions of populations and habitat of resident and migratory birds within the affected area also include current and historic grazing, crested wheatgrass seeding, invasive species, wildland fire, and drought.

Assumptions and methodology

No breeding bird or other extensive migratory bird surveys have been conducted directly within the Hammond Allotment. However, as habitats occurring within the nearest breeding bird survey

route are similar to those present within the allotment considered here, it is assumed that similar trends in species composition and abundance would be expected in coinciding habitats within a relatively close proximity.

It is also assumed that habitat quality and quantity is dependent on location within the allotment and the specific habitat type and patch size required for individual bird species. Observations made during field visits to the various pastures within the allotment indicate that migratory birds expected to occur in represented habitat types are present. In general, nesting habitat for cliff dwelling species occurs within and adjacent to the Hammond Allotment. Nesting habitat for birds that construct nests between or on top of rocks, in shrubs, or on the ground is present throughout the allotment where such habitat features are available. Foraging habitat for migratory birds is present and, as with nesting habitat, quantity and quality of available habitat is dependent on the type of forage being sought, the ecological condition of the site, and patch size of contiguous habitat.

Effects

Alternative 1

Grazing, as described on the 10-year grazing permit, would continue from April 1 to October 30 with 471 AUMs. Crested wheatgrass seedings in the allotment, particularly in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures, would receive light utilization by livestock. Ground nesting birds occur throughout the allotment. Grazing cattle can directly affect those species by reducing the amount of ground vegetation, which can result indirectly in decreased availability of potential nest sites (Walsberg 2005, Ryder 1980). Decreased ground vegetation also decreases the amount of hiding cover for ground nesting species, which can result in increased nest predation (Fondell and Ball 2005, Keyser et al. 1998, Ryder 1980).

Alternative 2

Alternative 2 would authorize between 1,000 and 1,500 nonrenewable AUMs of livestock grazing on crested wheatgrass seedings within the Hammond Allotment, specifically in the Hole in the Ground, Knox Springs, Landing Strip, Larkspur Reservoir, North Dutch Oven, South Dutch Oven, and the western half of Webb Springs pastures that are predominantly crested wheatgrass seedings.

The direct effects of alternative 2 would be similar as those described in alternative 1. However, increased grazing (from light to moderate grazing), particularly during the spring and early summer nesting period, could result in a greater likelihood of predation and reduced nesting success for migratory birds. Cattle present during the nesting season can also trample nests (Koerth et al. 1983, Guthery and Bingham 1996, Paine et al. 1996, and Sharps et al. 2017).

Cumulative effects

There are no known reasonably foreseeable projects in the Hammond Allotment.

Grazing by nonrenewable AUMs is considered in the effects analysis for this issue question and does include and consider the ongoing 10-year grazing permit use under alternative 2. There should be no negative cumulative impacts as a result of additional nonrenewable AUMs in the allotment. Based on breeding bird surveys coordinated by the U.S. Geological Survey's (USGS) Patuxent Wildlife Research Center, populations of migratory birds in the area have remained relatively stable, and species composition is consistent with habitat availability (USGS 2017). Proposed changes to grazing would not exceed the current utilization rate of 50 percent of native grasses and 60 percent of nonnative desirable grasses. As utilization would remain the same with the proposed changes, habitat availability would be unchanged and effects to migratory birds would therefore be negligible. The proposed changes would also improve habitat by limiting the accumulation of fine fuels and reducing the spread of invasive annual grasses that compete with vegetation preferred by most migratory birds.

Chapter 4 Public and Other Involvement

Notifications

The EA and finding of no significant impact (FONSI) were made available for review on BLM's website. Agencies, Native American Tribes, permittees, and members of the public with a known interest in grazing management activities within the allotment were notified by mail of the availability of the EA for review. This mailing list is contained in the project file.

List of preparers

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Appendix A – Wildlife in the Project Area

The Bureau of Land Management (BLM) completed wildlife surveys, habitat inventory and assessment, literature searches, and other research to determine which wildlife have habitat and are likely to be present in the project area, and how they could be impacted by each alternative. The table below summarizes the results for species the United States Fish and Wildlife Service (USFWS) lists as threatened, endangered, or proposed for listing, BLM sensitive species, species of local interest, and other species.

In accordance with Section 7 of the Endangered Species Act (ESA), as amended, the lead agency, in coordination with USFWS, must ensure that any Federal action to be authorized, funded, or implemented would not adversely affect a federally listed species or its designated critical habitat. Of these species, none would be affected by implementation of the alternatives because the project area is not located in designated critical habitat nor does the habitat contain the primary constituent elements required for these species to persist. Special status species (SSS) include those species federally listed under the ESA by the USFWS and in the BLM/United States Forest Service (USFS) Interagency Special Status/Sensitive Species Program (ISSSSP).

Special Status Species Management Policy 6840 requires the BLM to not only manage species listed under the ESA, but also to manage special status/sensitive species to prevent the need for future listing under the ESA. Species of other interest include those protected under various Federal laws (Migratory Bird Treaty Act, Bald and Golden Eagle Act, etc.). The status of the species in the project area are listed in the table below. Species that are not present or do not have habitat within the project area are not discussed further in this EA. Information on these species was reviewed from the ISSSSP as well as other research used to determine how sensitive species use the project area and the impacts this project would have on the species. The analysis area is considered the project area and is further referred to as such.

Mammals potentially occurring in the project area include badger, red fox, coyote, desert cottontails, white-tailed jackrabbit, ground squirrels, chipmunks, mice, voles, shrews, pocket gophers, and big game species. Additional wildlife species are present in the project area, but their population sizes are stable on average and do not currently exhibit negative density or distribution trends.

The Migratory Bird Treaty Act (MBTA), as amended, was implemented for the protection of migratory birds. Unless permitted by regulations, the MBTA makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including feathers or other body parts, nests, eggs, or migratory bird products. In addition, Executive Order 13186 sets forth the responsibilities of Federal agencies to implement the provisions of the MBTA by integrating bird conservation principles and practices into agency activities and by ensuring that Federal actions evaluate the effects of actions and agency plans on migratory birds. Oregon BLM non-sensitive migratory birds that could nest in the project area include vesper sparrow, horned lark, black-billed magpie, and common raven. Oregon Breeding Bird Atlas was used to identify potential birds in the area. Habitat requirements were then considered; if the action alternatives would not impact the species or habitat components, no further analysis will be completed because no impacts would occur.

The Status of Species Threatened, Endangered, or Proposed for Listing; BLM Sensitive Species; Species of Local Interest; and Other Species in the Project Area.

Species and Designation	Observed in EA Area	Likely to be in EA Area	Further Consideration Needed	Reason for Inclusion or Elimination for Further Analysis
Avian				
Greater Sage-Grouse (*Centrocercus urophasianus*)	No	Yes	Yes	See issues considered but not analyzed in detail #7c, Wildlife.
American peregrine falcon (*Falco peregrinus*)	No	No	No	No suitable habitat is present in the project area due to a lack of high cliff bands.
Bald eagle (*Haliaeetus leucocephalus*)	No	No	No	No suitable nesting habitat is present in the project area due to distance to large water bodies and trees of adequate size to support nest structures. Atypical foraging habitat is present.
Black-necked stilt (*Himantopus mexicanus*)	Yes	Yes	No	As proposed, the proposed actions maintain current grazing utilization level not to exceed 50% on native vegetation. For these reasons, no measurable impacts to Black-necked stilt or its habitat are expected, and further evaluation will not be carried forward in this analysis.
Bobolink (*Dolichonyx oryzivorus*)	Yes	Yes	No	Occurs in areas of contiguous shrubs with abundant grass and forb understory within the evaluation area. The proposed grazing would maintain current utilization level not to exceed 50% and would, thereby, not alter the amount of habitat available. For these reasons, no measurable impacts to bobolink or its habitat are expected, and further evaluation will not be carried forward in this analysis.
Franklin's gull (*Leucophaeus pipixcan*)	No	No	No	No suitable habitat is present in the project area due to a lack of marshes and lakes within or adjacent to the allotment.
Black rosy finch (*Leucosticte atrata*)	No	Yes	No	Habitat, including rocky areas and cliffs as well as sagebrush steppe, is present within the allotment. Proposed grazing changes would either have no effect or improve foraging habitat over time.
Lewis' Woodpecker (*Melanerpes lewis*)	No	No	No	No open pine woodland habitats are present within the allotment.
Snowy egret (*Egretta thula*)	Yes	Yes	No	Limited habitat is available where water sources containing adequate forage species such as frogs, aquatic insects, and crustaceans are present and occur adjacent to willow or other dense deciduous cover. As snowy egrets are associated with riparian, marsh, and tree habitats occurring next to water, proposed grazing of perennial and annual grasses is not

Species and Designation	Observed in EA Area	Likely to be in EA Area	Further Consideration Needed	Reason for Inclusion or Elimination for Further Analysis
				expected to impact this species. For this reason, no measurable impacts to snowy egrets or their habitat are expected and further evaluations for this species are not carried forward in this analysis.
Western snowy plover (*Charadrius alexandrinus nivosus*)	No	No	No	No suitable habitat is present within the project area due to a lack of alkali playas.
White-headed woodpecker (*Picoides albolarvatus*)	No	No	No	No open ponderosa pine or other woodland habitats are present within the allotment.
Yellow-billed cuckoo (*Coccyzus americanus*)	No	No	No	No suitable habitat is present within the project area due to a lack of large expanses of riparian woodlands.
Reptiles and Amphibians				
Columbia spotted frog (*Rana luteiventris*)	No	No	No	No habitat is available within the allotment due to the lack of permanent bodies of water or streams.
Mammals				
Gray wolf (*Canis lupis*)	No	No	No	No known populations of wolves have been documented in the area. Due to close proximity to human population, wolves are unlikely to occur within the Hammond Allotment. For this reason, no further analysis will be carried forward.
Canada lynx (*Lynx canadensis*)	No	No	No	No habitat is available within the allotment due to the lack of boreal coniferous forest.
Pallid bat (*Antrozous pallidus*)	No	Yes	No	Livestock grazing, proposed range developments, and maintenance would have no effect on bat hibernacula or roosting and breeding habitats. Proposed grazing changes that incorporate growing season rest periods would likely improve foraging habitat over time. For these reasons, further analysis will not be carried forward.
Townsend's big-eared bat (*Corynorhinus townsendii*)	No	Yes	No	Livestock grazing as proposed would have no effect on bat hibernacula or roosting and breeding habitats. For this reason, further analysis will not be carried forward.
Spotted bat (*Euderma maculatum*)	No	Yes	No	Livestock grazing as proposed would have no effect on bat hibernacula or roosting and breeding habitats. For this reason, further analysis will not be carried forward.
Fringed myotis (*Myotis thysanodes*)	No	Yes	No	Livestock grazing as proposed would have no effect on bat hibernacula or roosting and breeding habitats. For this reason, further analysis will not be carried forward.

Species and Designation	Observed in EA Area	Likely to be in EA Area	Further Consideration Needed	Reason for Inclusion or Elimination for Further Analysis
Wolverine (*Gulo gulo*)	No	No	No	No montane boreal habitat is present within the allotment.
Pygmy rabbit (*Brachylagus idahoensis*)	No	No	No	No pygmy rabbit habitat is available; there has been no observation of pygmy rabbits within the allotment. For this reason, further analysis will not be carried forward.
Kit fox (*Vulpes macrotis*)	No	No	No	No large expanses of alkali shrub habitats are present within the allotment.
Insects				
Western bumblebee (*Bombus occidentalis*)	No	No	No	No habitat occurs for Western bumblebees nor are they likely to be present within the Hammond Allotment. For these reasons, no further analysis for western bumblebees will not be carried forward in this document.

Appendix B – References Cited in EA or Used in Analysis

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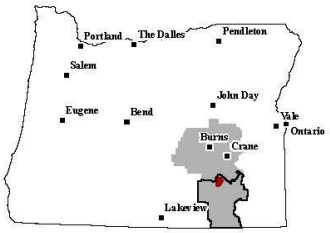
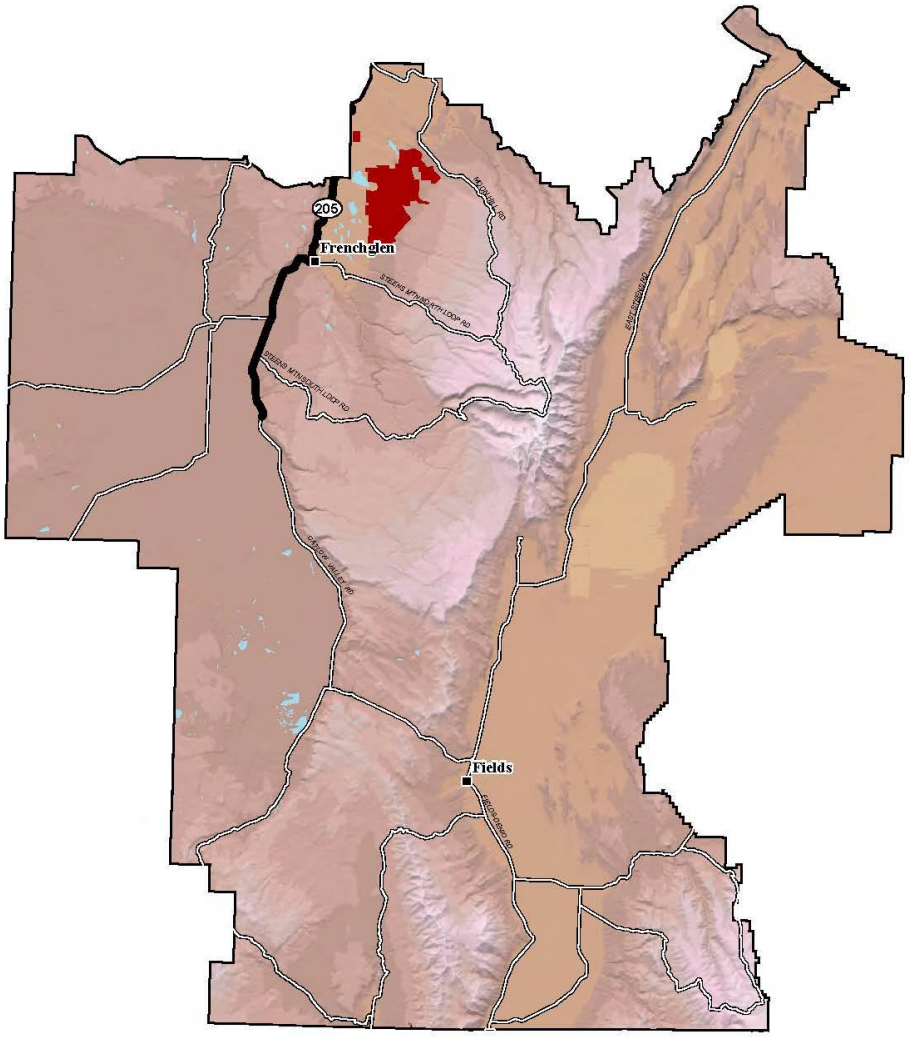
Appendix C – Ecological Sites by Acres within the Crested Wheatgrass Pastures

Pastures Proposed for NR AUM Livestock Use by Acres of Ecological Site

PASTURE NAME ECOLOGICAL SITE NAME	ACRES BY RANGE SITE
HOLE IN THE GROUND #11	**437**
LOAMY 10–12	437
KNOX SPRING #5	**2,514**
CLAYEY 10–12	50
CLAYPAN 12–16	62
LOAMY 10–12; CLAYEY 10–12	2,090
LOAMY 12–16	234
NORTH SLOPES 12–16	47
SOUTH SLOPES 12–16; MISC LAND TYPE	30
LANDING STRIP #9	**238**
DROUGHTY LOAM 11–13	238
LARKSPUR RES #6	**1,233**
LOAMY 10–12	45
LOAMY 10–12;CLAYEY 10–12	1,031
LOAMY 12–16	103
SOUTH SLOPES 8–12; MISC LAND TYPE	55
NORTH DUTCHOVEN #1	**1,279**
LOAMY 10–12	1,269
NORTH SLOPES 12–16	10
SOUTH DUTCHOVEN SEED #10	**618**
LOAMY 10–12	618
WEBB SPRINGS #4	**1,386**
CLAYEY 10–12	431
LOAMY 10–12	8
LOAMY 10–12; CLAYEY 10–12	593
LOAMY 12–16	294
SOUTH SLOPES 8–12; MISC LAND TYPE	60
Grand Total	**7,705**

Hammond Allotment Vicinity Map





Allotment Boundary

Andrews Resource Area Boundary

Highways

Not All Roads Are Shown

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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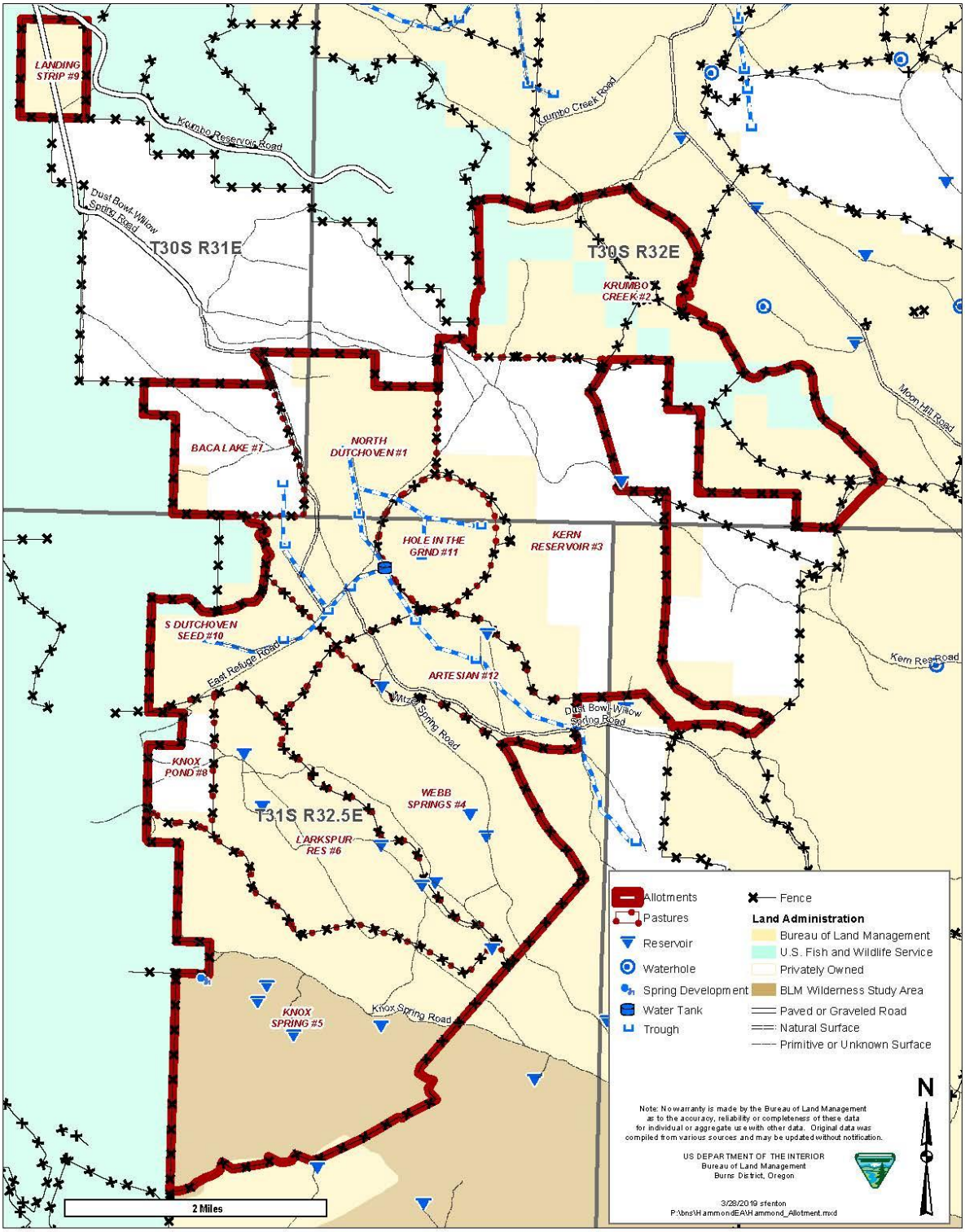
Hammond Allotment
Boundary and Range Improvements



Hammond Allotment
Ecological Sites and Crested Wheatgrass Seedings