

Medford Bureau of Land Management
3040 Biddle Road
Medford, Oregon 97501

October 2008

Devon South Allotment –
STANDARDS OF RANGELAND HEALTH ANALYSIS



Table of Contents

Introduction

Overview of the Evaluation area and principle findings

Assessment

The Existing Environment and an Overview of Rangeland Health Assessment Process

Maps

Map 1- Devon South Allotment map

Tables

Table 1 - Elevational zones within the Devon South Allotment

Table 2 - Special Status Species (Terrestrial Wildlife)

Table 3 - *Bird Species of Conservation Concern*

Table 4 - RHFA Indicator Summary

Assessment Participants (Name and Discipline):

Kimberly Hackett	-Rangeland Management
Steve Slavik	-Rangeland Management
Ted Hass	- Soils
Steven Godwin	- Terrestrial Wildlife
Jennifer Smith	- Aquatic/Fisheries
Tim Montfort	- Hydrology
Dulcey Schuster	- Botany

INTRODUCTION

This is an Oregon/Washington Bureau of Land Management (BLM) Standards of Rangeland Health Evaluation that addresses the Devon South Allotment (10043). The allotment is located south of highway 140 in T. 36 S., R. 1E. , Sections 14 and 15 Willamette Meridian (Map 1). The analysis area is 412 BLM acres with 13 cows permitted from April 16-June 30, totaling 33 Animal Unit Months (AUMs).

Vegetation

The vegetation in this allotment is predominately a mosaic of (*Ceanothus cuneatus*), Oregon white oak (*Quercus garryana*) woodland with Pacific madrone (*Arbutus menziesii*) on the northern slopes. Ponderosa pine (*Pinus ponderosa*), and Pacific poison oak (*Toxicodendron diversilobum*) are also components of the plant community within the Devon South Allotment. Native grasses, including needlegrass (*Achnatherum sp.*), and California oatgrass (*Danthonia californica*) grow in the open areas and Oregon white oak understory. Species such as tall fescue (*Festuca arundinacea*), blue wildrye (*Elymus glaucus*), and California brome (*Bromus carinatus*) grow in the denser understory of Pacific madrone and Ponderosa pine, depending on local conditions of soil, topography, and shade. Forb species such as shooting star (*Dodecatheon hendersonii*), deltoid balsamroot (*Balsamorhiza deltoidea*), Klamath fawnlily (*Erythronium klamathehense*), Menzies' larkspur (*Delphinium menziesii*), (western buttercup) (*Ranunculus occidentalis*), and common lomatium (*Lomatium utriculatum*) are common throughout the allotment. Annual and short-lived perennial weedy grasses, including medusahead (*Taeniatherum caput-medusae*) and bristly dogstail (*cynosurus echinatus*), grow within the allotment.

Soils

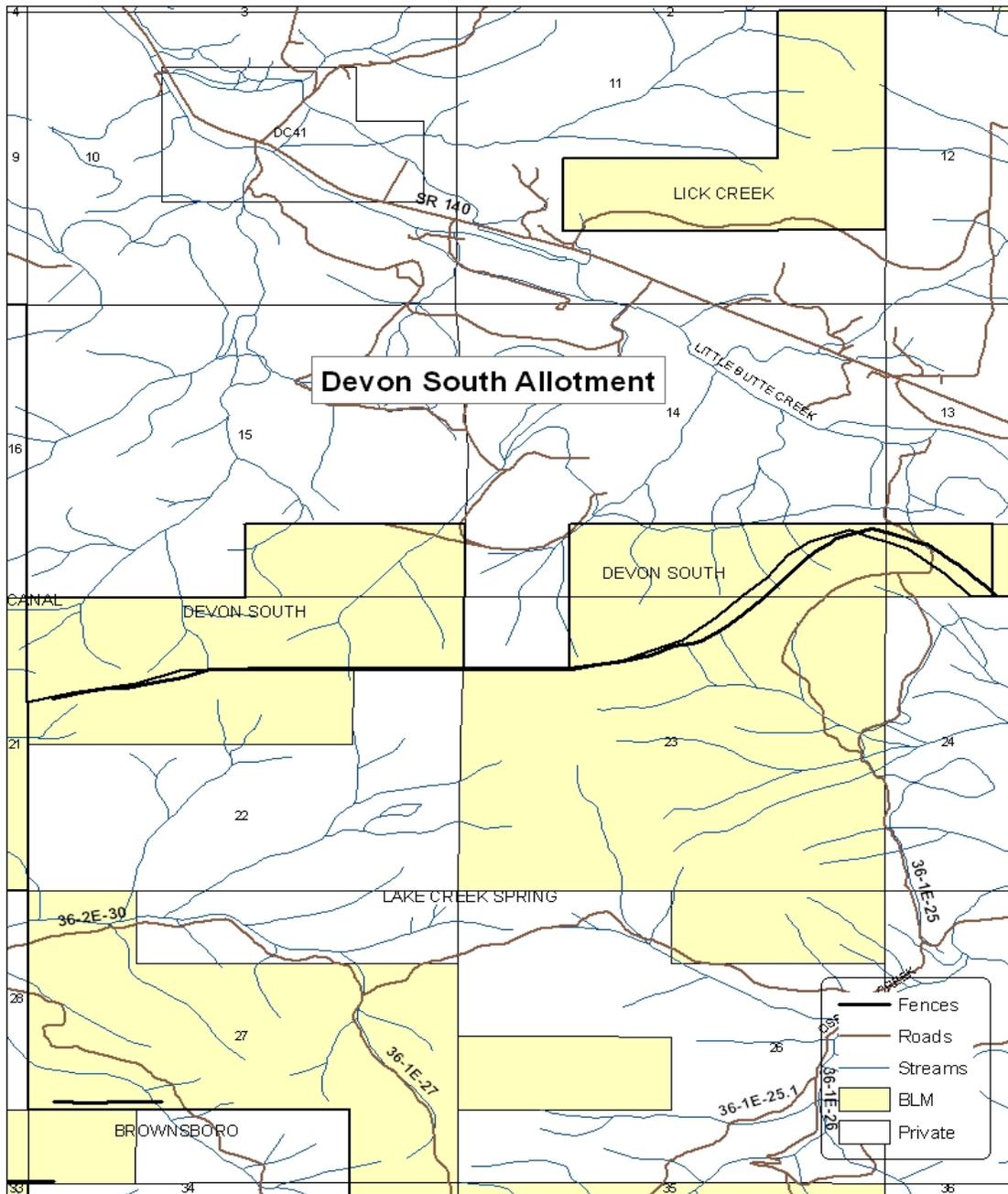
The soils identified in this allotment formed from colluvium and alluvium from andesite, breccia and tuffs. The soils are found on slopes ranging from 12 to 60 percent. The dominant soil series identified on this allotment were Medco, McMullin and McNull. The Medco soil is moderately deep, moderately well drained on hillslopes. Permeability is very slow in the Medco soil. Available water capacity is about 4 inches. The effective rooting depth is limited by a dense layer of clay at a depth of 6 to 18 inches. Runoff is medium, and the hazard of water erosion is moderate.

The McMullin soil is shallow and well drained. Permeability is moderate in the McMullin soil. Available water capacity is about 2 inches. Runoff is rapid, and the hazard of water erosion is high. Rock outcroppings are often intermingled with the McMullin soil series. McNull is a moderately deep, well drained soil. Permeability is slow in the McNull soil. Available water capacity is about 4 inches. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate.

Hydrology

The Devon South Allotment encompasses the headwaters of several frontal tributaries to Little Butte Creek, a tributary to the Rogue River. There are no perennial streams within the allotment boundary but there are almost three miles of intermittent streams and one mile of dry draws. When these streams are flowing, water is "captured" by the Medford Irrigation District canal that parallels Little Butte Creek, downstream of the allotment boundary. Capture would normally occur outside the irrigation season, at a time when water from the canal flows several miles before being released into Antelope Creek.

Map 1- Devon South Allotment map



ASSESSMENT

Rangeland Health Assessments are required on each allotment prior to consideration of grazing lease renewal. These assessments are conducted by an interdisciplinary team of resource specialists who assess ecological processes, watershed functioning condition, water quality conditions, special status species, and wildlife habitat conditions on an allotment. Assessments include field visits to the allotments and evaluation of all available data. All available data will be used to make an overall assessment of rangeland health as described in the *Standards for*

Rangeland Health and Guidelines and Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington (Standards and Guidelines) (USDI 1997), in light of the Fundamentals of Rangeland Health at 43 CFR § 4180.1.

The Standards and Guidelines identify five specific standards that are used to determine the degree to which “ecological function and process exist within each ecosystem.” Standards address the health, productivity, and sustainability of the BLM-administered public rangelands and represent the minimum acceptable conditions for the public rangelands. The guidelines are management practices that will either maintain existing desirable conditions or move rangelands toward statewide standards within reasonable timeframes.

This assessment summarizes existing resource conditions on the Devon South Allotment using information derived from rangeland field assessments; BLM monitoring data; and all other available data in relation to the five specific standards described in the Standards and Guidelines (USDI 1997).

Primary Supporting Data:

Rangeland Health Field Assessments: Field assessments using the protocol described in *Technical Reference 1734-6: Interpreting the Indicators of Rangeland Health* (USDI and USDA 2005) were conducted July 23, 2008 at an ecological site mapped as loamy slopes on the Devon South Allotment.

Botany Surveys: Botany Surveys were conducted on the Devon South Allotment in 2008 using the Intuitive Controlled Survey. This method includes a complete survey in habitats with the highest potential for locating Survey and Manage species. The surveyor traverses through the project area enough to see a representative cross section of all the major habitats and topographic features, looking for the target species while en route between different areas. Most of the project area will have been surveyed. When the surveyor arrives at an area of high potential habitat (that was defined in the pre-field review or encountered during the field visit), a complete survey for the target species was made.

Standard 1 Watershed Function - Uplands

To meet this standard, upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate, and landform.

This standard focuses on the basic physical functions of upland soils that support plant growth, the maintenance or development of plant populations and communities, and promote dependable flows of quality water from the watershed.

To achieve and sustain rangeland health, watersheds must function properly. Watersheds consist of three principle components: the uplands, riparian/wetland areas and the aquatic zone. This standard addresses the upland component of the watershed. When functioning properly, within its potential, a watershed captures, stores and safely releases the moisture associated with normal precipitation events (equal to or less than the 25 year, 5 hour event) that falls within its boundaries. Uplands make up the largest part of the watershed and are where most of the moisture received during precipitation events is captured and stored.

While all watersheds consist of similar components and processes, each is unique in its individual makeup. Each watershed displays its own pattern of landform and soil, its unique climate and weather patterns, and its own history of use and current condition. In directing management toward achieving this standard, it is essential to treat each unit of the landscape (soil, ecological site, and watershed) according to its own capability and how it fits with both smaller and larger units of the landscape.

Numerous hummocky areas were observed throughout the allotment, the result of early season grazing by livestock on wet soils and/or season long grazing by wildlife such as elk. Because of the low precipitation and high clay soils of this allotment these areas do not appear to fully recover between grazing seasons.

A Rangeland Health Field Assessment (RHFA) was conducted on the allotment at a loamy slopes ecological site in July of 2008. Looking only at indicators pertaining to Soil/Site Stability revealed that all 10 indicators were rated none to slight, and zero were rated; slight to moderate, moderate, moderate to extreme, or an extreme to total departure.

Standard 2 Watershed Function - Riparian/Wetland Areas

To meet this standard, riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform.

Riparian-wetland areas are grouped into two major categories: 1. lentic, or standing water systems such as lakes, ponds, seeps, bogs, and meadows; and 2. lotic, or moving water systems such as rivers, streams, and springs. Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Riparian areas commonly occupy the transition zone between the uplands and surface water bodies (the aquatic zone) or permanently saturated wetlands.

Properly functioning condition of riparian and wetland areas describes the degree of physical function of these components of the watershed. Their functionality is important to water quality in the capture and retention of sediment and debris, the detention and detoxification of pollutants, and in moderating seasonal extremes of water temperature. Properly functioning riparian areas and wetlands enhance the timing and duration of stream flow through dissipation of flood energy, improved bank storage, and ground water recharge. Properly functioning condition should not be confused with the Desired Plant Community (DPC) or the Desired Future Condition (DFC) since, in most cases, it is the precursor to these levels of resource condition and is required for their attainment.

Very little information exists for stream systems in this 412-acre allotment that permits 13 cows from April 16 to June 30th. Several intermittent stream channels flow through the allotment and one perennial seep is located in the northwestern corner of the allotment in section 15. Riparian features throughout the allotment show little sign of cattle use. All drainages in the allotment are “captured” by the Medford Irrigation Ditch, effectively reducing connectivity between the allotment and any downstream perennial waters. A short section of the major channel on the east side of section 15 is entrenched but does not appear to be as a result of cattle grazing.

Standard 3 Ecological Processes

To meet this standard, healthy, productive, and diverse plant and animal populations and communities appropriate to soil, climate, and landform are supported by ecological processes of nutrient cycling, energy flow and the hydrologic cycle.

This standard addresses the ecological processes of energy flow and nutrient cycling as influenced by existing plant and animal communities. While emphasis may be on native species, an ecological site may be capable of supporting a number of different native and introduced plant and animal populations and communities while meeting this standard. This standard also addresses the hydrologic cycle which is essential for plant growth and appropriate levels of energy flow and nutrient cycling.

The ability of plants to capture sunlight energy, to grow and develop, plays a role in soil development and watershed function. Nutrients necessary for plant growth are made available to plants through the decomposition and metabolization of organic matter by insects, bacteria and fungi, the weathering of rocks and extraction from the atmosphere. Nutrients are transported through the soil by plant uptake, leaching and by rodent, insect and microbial activity. They follow cyclical patterns as they are used and reused by living organisms.

The ability of rangelands to provide habitat for wildlife and satisfy social and economic needs depends on the buildup and cycling of nutrients over time. Interrupting or slowing nutrient cycling can lead to site degradation, as these lands become increasingly deficient in the nutrients plants require.

Some plant communities, because of past livestock use, fire frequency, or other past extreme or continued disturbances, are incapable of meeting this standard. For example, shallow-rooted winter-annual grasses that completely dominate some sites do not fully occupy the potential rooting depth of some soils, thereby reducing nutrient cycling well below optimum levels. In addition, these plants have a relatively short growth period and thus capture less sunlight than more diverse plant communities. Plant communities like those cited in this example are considered to have crossed the threshold of recovery and often require great expense to be recovered. The cost of recovery must be weighed against the site's potential ecological/economic value in establishing treatment priorities.

There is a healthy mix of live and dead/decaying matter on the rangeland and the energy, nutrient, and hydrologic cycles are balanced, utilization is low enough to not disrupt these cycles. The dry meadows and oak woodland plant communities support a diverse mix of plant species. However, invasive annual grass species are scattered in patches throughout the allotment. In addition to reducing habitat quality for wildlife, annual grasses have shallower root systems and shorter life cycles than native perennial grasses, and thus have reduced capacity to hold the soil and retain water and nutrients. Introduction and establishment of exotic annual grasses occurred in past decades, and current livestock grazing is not intense enough to contribute to additional conversion of native plant communities to exotic annual grasslands.

Standard 4 Water Quality

To meet this standard, surface water and groundwater quality, influenced by agency actions, complies with State water quality standards.

The quality of the water yielded by a watershed is determined by the physical and chemical properties of the geology and soils unique to the watershed, the prevailing climate and weather patterns, current resource conditions, the uses to which the land is put and the quality of the management of those uses. Standards 1, 2 and 3 contribute to attaining this standard.

States are legally required to establish water quality standards and Federal land management agencies are to comply with those standards. In mixed ownership watersheds, agencies, like any other land owners, have limited influence on the quality of the water yielded by the watershed. The actions taken by the agency will contribute to meeting State water quality standards during the period that water crosses agency administered holdings.

No water quality data exists on the intermittent streams that flow through the allotment or the perennial seep located in the northwestern corner of the allotment in section 15. There are no 303(d) listed streams in the allotment. The riparian features throughout the allotment show little evidence of cattle use. Cattle use within the allotment was most concentrated where the intermittent channels are intercepted by the Medford Irrigation Canal. The riparian plant community is in healthy condition. Stream features in the allotment have adequate shade and are likely to maintain lower water temperatures during periods of surface flow. All drainages in the allotment are

intercepted by the Medford Irrigation Canal which effectively captures any sediment mobilized in the stream channels and eliminates connectivity with any perennial waters.

Standard 5 Native, T&E, and Locally Important Species

To meet this standard, habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate, and landform.

Federal agencies are mandated to protect threatened and endangered species and will take appropriate action to avoid the listing of any species. This standard focuses on retaining and restoring native plant and animal (including fish) species, populations and communities (including threatened, endangered and other special status species and species of local importance). In meeting the standard, native plant communities and animal habitats would be spatially distributed across the landscape with a density and frequency of species suitable to ensure reproductive capability and sustainability. Plant populations and communities would exhibit a range of age classes necessary to sustain recruitment and mortality fluctuations. The plant communities on this allotment are floristically diverse, healthy, and support a wide variety of animal species consistent with the surrounding soil, landscape and climate.

Species are recognized as "special status" if they are federally listed as threatened or endangered, proposed or a candidate for federal listing as threatened or endangered, or if they are a BLM sensitive or assessment species. BLM policy is to manage for the conservation of these species and their habitat so as not to contribute to the need to list and to recover these species.

Bureau Special Status wildlife: There are no known occurrences of Threatened or Endangered terrestrial wildlife species within this allotment.

Table 1: Elevational zones within the Devon South Allotment.

Zones	Representative Plant Communities
Interior Valley Zone	Grassland, Dry and Semiwet Meadows, Shrublands, Dry Oak Woodlands
Mixed Conifer Zone	Douglas Fir, Mixed Fir and Pine,

Special/unique habitats that support various wildlife species occur within the Devon South Allotment. These special habitats include seeps and springs, and meadows (USDI 1995a).

Special Status species known or likely to be present on the allotment are displayed in Table 2.

Table 2: Special Status Species (Terrestrial Wildlife)

Species	Species Status
bald eagle (<i>Haliaeetus leucocephalus</i>)	BS
Lewis' woodpecker (<i>Melanerpes lewis</i>)	BS
pallid bat (<i>Antrozous pallidus</i>)	BS
fringed myotis (<i>Myotis thysanodes</i>)	BS
coronis fritillary (<i>Speyeria coronis coronis</i>)	BS
Siskiyou short-horned grasshopper (<i>Chloealtis aspasma</i>)	BS
Franklin's bumblebee (<i>Bombus franklini</i>)	BS

BS - Bureau Sensitive

BLM recently issued interim guidance for meeting BLM’s responsibilities under the Migratory Bird Treaty Act and Executive Order (EO) 13186. Both the Act and the EO promote the conservation of migratory bird populations. The interim guidance was transmitted through Instruction Memorandum (IM) No. 2008-050. The IM relies on two lists prepared by the U.S. Fish and Wildlife Service in determining which species are to receive special attention in land management activities. The lists are *Bird Species of Conservation Concern* (BCC) found in various Bird Conservation Regions and *Game Birds Below Desired Condition* (GBBDC). Table 3 displays those species that are known or likely to present on the allotment.

Table 3: Bird Species of Conservation Concern

Species	Species Status
black-throated gray warbler (<i>Dendroica nigrescens</i>)	BCC
Lewis’ woodpecker (<i>Melanerpes lewis</i>)	BCC
olive-sided flycatcher (<i>Contopus cooperi</i>)	BCC
rufous hummingbird (<i>Selasphorus rufus</i>)	BCC
mourning dove (<i>Zenaida macroura</i>)	GBBDC
band-tailed pigeon (<i>Columba fasciata</i>)	GBBDC

BCC - Bird of Conservation Concern

GBBDC - Game Birds Below Desired Condition

Grazing occurs throughout all of the vegetative zones found in the Devon South Allotment, i.e., Interior Valley Zone, and Mixed-Conifer Zone. The impacts of grazing in the Mixed-Conifer Zone is most notable in the meadows and riparian areas that are interspersed throughout the more dominant conifer matrix. Grazing impacts in the Interior Valley Zone are more widespread due to the abundant grasses found in this zone; but, as in the other zones, cattle use tends to be concentrated in the meadows and riparian areas.

Livestock grazing primarily affects wildlife by changing vegetation composition, structure, and function. Grazing can result in a reduction of forage available to native herbivores (e.g. deer and elk), as well as reductions in vegetative ground cover for ground-nesting birds, rodents, and other wildlife species dependent on ground cover for protection, food, and breeding sites. Grazing also reduces water quality in seeps, springs, and streams used by native wildlife. The presence of livestock can also change local distribution and habitat use by native species due to interspecific behavioral traits. Generally, the extent of impacts to individual T&E species and their habitats are unknown.

A Bald Eagle nest is known to be located within this allotment, but is unlikely to be impacted by grazing as neither their treetop nest sites nor the fish and waterfowl upon which they feed are subject to significant impacts from grazing. The lack of impacts is also suggested by the fact that grazing has been occurring since before the eagles chose this nest site, and the eagles have successfully produced young on more than one occasion.

Some of the species of special interest found in the allotment are not greatly affected by grazing. The suite of species that would not be affected or affected only to a minor degree includes the following: Lewis’s woodpecker, black-throated gray warbler, olive-sided flycatcher, pallid bat and fringed myotis. Grazing has little or no impacts on these species because it does not physically reduce their numbers nor does it reduce feeding, breeding and sheltering opportunities. These species are primarily associated with the Mixed-Conifer zone except for Lewis’s woodpecker which is more closely associated with the Interior Valley Zone.

Some species of special interest are susceptible to the physical aspects of grazing, e.g., trampling, rubbing, and water quality degradation while others are sensitive to the removal of forage. Those in the former group include Siskiyou short-horned grasshopper. The Siskiyou short-horned grasshopper (a Bureau Sensitive Species) is known

to occur at a location within 6 miles of the boundary of this allotment. It may be dependent on Elderberry for the egg-laying phase of its life cycle, but has been located in areas without elderberry. Suitable habitat occurs within the Devon South allotment. Cattle have been documented to impact elderberry and other vegetation through use as rubbing objects. Siskiyou short-horned grasshoppers are actively feeding and reproducing from July through September and are likely to be impacted by reduction of Elderberry vegetation and by grass and forb resources upon which they depend for food and protective cover. As with the Siskiyou short-horned grasshopper, band-tailed pigeon are likely affected by grazing due to the impact to blue elderberry which is a preferred food for this species during migration. Those species in the latter group (i.e., affected by forage removal) include rufous hummingbird, mourning dove, coronis fritillary, band-tailed pigeon, deer, and elk. Rufous hummingbird, and coronis fritillary are likely affected by grazing due to the removal of plants used for nectaring. Herbaceous vegetation (violets) used by coronis fritillary for ovipositing and larval feeding can also be removed or trampled, and heavy grazing facilitates the invasion of non-native species (Xerces 2007, Hosten 2007a) which fail to provide these wildlife species with the foraging opportunities they require.

Franklin's bumblebee (a Bureau Sensitive Species) was once locally common throughout the Rogue Basin in southern Oregon. Now known to only one site confirmed active in 2006 (Robbin Thorp Pers. comm.), the species is in steep decline. This bee species favors open areas with abundant flowering shrub and forb species and rodent burrows used for nesting. Consumption of such shrubs and forbs, and trampling of suitable nesting sites limits the ability of this species to successfully maintain a population at formerly suitable sites.

Several bird species on these lists (e.g. olive-sided flycatcher, mourning dove, and band-tailed pigeon) depend on either seeds or insects for their diet and may also be affected by grazing.

There is little diet overlap between livestock and deer with greater overlap of preferred forage between livestock and elk. There is a tendency of both deer and elk to avoid areas being grazed by cattle (Hosten, P. E. et al. 2007b). Grazing in this allotment reduces forage during spring, summer, and fall and has corresponding detrimental effects on big game species.

Big Game Winter Range Area:

This allotment is within an area designated by the Medford RMP as a Big Game Winter Range Area for deer and elk. This designation is meant to identify areas to promote forage, hiding, and thermal cover for deer and elk (USDI 1994).

Special Status Species (Aquatic):

There are no known occurrences of Special Status or Threatened or Endangered aquatic species within this allotment.

Bureau Special Status fungi, lichens, and bryophytes:

There are no occurrences of special status fungi, lichens, and bryophytes.

Federally Listed, and Bureau Sensitive Status Vascular Plants:

There are no occurrences of special status vascular plant species.

Noxious Weeds:

There were no occurrences of broadleaved weeds within the allotment. Medusahead and other exotic annual grasses are present in some meadows within the allotment. Exotic annual grass infestations are of concern because they alter the ecological functioning of native plant communities, reduce the value of wildlife habitat, and provide inferior forage for wildlife and livestock (D'Antonio and Vitousek, 1992). The areas most likely to experience conversion from native perennial grasslands to exotic annual grasslands have already undergone conversion, and

current stocking rates are unlikely to convert additional areas of remnant native grassland. Field visits to the allotment and BLM monitoring data in surrounding areas suggests exotic annual grasses are not spreading rapidly under current grazing regimes. However, areas that experience soil and vegetation disturbance within the allotment are at risk for weed colonization. The BLM weed control program uses herbicides, biological control agents, and hand pulling to treat infestations across the landscape as time, budget, and personnel constraints allow.

RANGELAND HEALTH FIELD ASSESMENT SUMMARY OF FINDINGS

Rangeland Health is defined as the degree in which the integrity of the soil, vegetation, water, and air as well as the ecological processes of the rangeland ecosystem are balanced and sustained (USDA 1997). This qualitative assessment along with quantitative monitoring data is an attempt to look at how well ecological processes such as the water cycle (capture, storage, and safe release of precipitation), energy flow (conversion of sunlight to plant and then animal matter), and nutrient cycle (the cycle of nutrients through the physical and biotic components of the environment) are functioning. The product of this qualitative assessment is not a single rating of rangeland health, but an assessment of three interrelated attributes: Soil/site stability, Hydrologic function, and Biotic integrity. Attributes are rated based on what would be expected for the site or a “reference state” based on soils, climate and topography compared to the current state. The attributes are split into seventeen indicators that are rated as none to slight, slight to moderate, moderate, moderate to extreme, and extreme to total departures from the reference state (table 4).

A RHFA was completed at a pine-Douglas fir-fescue ecological site. The ecological site was chosen by using GIS (Global Information Systems) mapping that defined vegetative communities and soils followed by field surveys to determine a representative location to complete the assessment. The assessments were completed with an IDT (Interdisciplinary team).

Location 1: Loamy Slopes Summary

The overall rating for this location is a None-to-Slight departure from what would be expected for this site. Sixteen indicators (94%) were rated None to Slight, one indicator (6%) was rated Slight to Moderate, and zero of the indicators were rated Moderate, Moderate to Extreme, or Extreme to Total departures from the ecological reference condition.

Photo 1. Photo taken at the Loamy Slopes ecological site.



Table 4: RHFA indicator summary

Location 1: Pine-Douglas fir-Fescue					
Indicator	Degree of Departure from Ecological Site Description				
	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
1. Rills					✓
2. Water Flow Patterns					✓
3. Pedestals and/or Terracettes					✓
4. Bareground					✓
5. Gullies					✓
6. Windscored Blowouts					✓
7. Litter movement					✓
8. Soil surface resistance to erosion					✓
9. Soil surface loss or degradation					✓
10. Plant community composition and distribution relative to infiltration					✓
11. Compaction Layer					✓
12. Functional/Structural groups					✓
13. Plant mortality/ decadence					✓
14. Litter amount					✓
15. Annual Production					✓
16. Invasive Plants				✓	
17. Reproductive capability of Perennial plants					✓

References

D'Antonio, C. M. and Vitousek, P. M. 1992. Biological Invasions by Exotic Grasses, the Grass/Fire Cycle, and Global Change. *Annual Review of Ecology and Systematics*, 23:63-87.

Dusek, G.L. 1975. Range Relations of Mule Deer and Cattle in Prairie Habitat. *Journal of Wildlife Management* 39 (3) 605-616.

Ehrenfeld, J. G. 2003. Effects of Exotic Plant Invasions on Soil Nutrient Cycling Processes. *Ecosystems* 6:503-523.

US Department of Agriculture, U.S. Department of the Interior, Bureau of Land Management, and the Oregon Agricultural Exper. Sta.. 1993. Soil survey of Jackson County area, Oregon.

US Department of the Interior Bureau of Land Management, Portland, OR. 2008. Oregon and Washington Bureau of Land Management Special Status Species List.

US Department of the Interior, Bureau of Land Management. Portland, OR 1997. Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington.

US Department of the Interior, Bureau of Land Management, Medford District 1995. Record of Decision and Resource Management Plan.

US Department of the Interior, Bureau of Land Management, Medford District 1993. Medford Grazing Management Program Environmental Impact Statement.

Kimberly Hackett 10/3/08
Kimberly Hackett: Rangeland Management

Steven Godwin
Steven Godwin: Terrestrial Wildlife

Ted Hass 10-7-08
Ted Hass: Soils

Jennifer Smith 10.16.08
Jennifer Smith: Aquatic Fisheries

Tim Montfort 10/16/08
Tim Montfort: Hydrology

Dulcey Schuster 10/3/08
Dulcey Schuster: Botany/ Environmental Coordinator