Medford Bureau of Land Management
3040 Biddle Road
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Conde Creek Allotment –

STANDARDS OF RANGELAND HEALTH ANALYSIS

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INTRODUCTION

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.

Public lands within this region of southwestern Oregon are topographically diverse. Elevation varies from about 3,000 feet to 5,500 feet near the divide between Conde and Lost Creeks. Most of the allotment is in the transient snow zone and receives approximately 33 inches of rainfall between November and April. Plant communities represent several different ecosystems and the diversity associated with each, including coniferous forests, meadows and riparian habitats. Stringer meadows throughout the allotment offer a unique ecosystem with correspondingly interesting flora and fauna. Aquatic habitat conditions have been the centerpiece of most management actions and ongoing grazing adjustments.

This document is an Oregon/Washington Bureau of Land Management (BLM) Standards of Rangeland Health Evaluation that addresses the Conde Creek Allotment (20117). The Conde Creek Allotment is 5,346 acres with 168 cows permitted from June 16–September 30 totaling 591 Animal Unit Months (AUMs). Additionally, 352 AUMs are permitted under an exchange of use agreement for a total of 943 AUMs. Administration occurs within the Ashland Resource Area, Medford District. Herein, BLM summarizes resource condition findings derived from long-term monitoring studies and rangeland field assessments in relation to Oregon and Washington Standards and Guidelines (S&Gs). The findings and alternatives will be considered and analyzed in an Environmental Assessment (EA) and be used as the basis for a grazing lease renewal decision.

Existing Terms and Conditions

The following are the terms and conditions under the current lease (2006-2016)

- Turn-out will be based upon range readiness
- Actual use reports are to be returned within 15 days of the off-date
- Maintenance of assigned range improvements is a requirement of the lease
- Billings are due upon receipt and must be paid prior to turn-out
- Late payment may result in unauthorized use, late fees and/or interest penalty
- BLM approved ear tags are required

Recent Improvements

Improvements since 2006 under the current lease include:

- A protective exclosure was constructed in Section 7, along Conde Creek which excludes grazing around an affected riparian area. The exclosure is approximately 4 acres in size and excludes approximately 500 feet of Conde Creek on either side of the Conde Creek road. The exclosure

was constructed using five strands of smooth wire fencing material with a twenty foot T-bar spacing and four panel corners made of steel.

- A protective exclosure was constructed in Sec. 31, in the Big Glades area to exclude grazing in an affected riparian area. The exclosure at Big Glades is approximately ½ an acre in size and protects a perennially wet seep that is approximately 30 feet x 70 feet. The exclosure was constructed using five strands of smooth wire fencing material with a twenty foot T-bar spacing and four panel corners made of steel.

- An extension of an existing exclosure (BLM project number 750535, Aspen Exclosure) now protects an area inhabited by the mardon skipper from livestock grazing, a species that is a federal candidate for listing under the Endangered Species Act. Under the Bureau Special Status Species Policy (BLM Handbook 6840, 2008) candidate species are to be managed as Sensitive Species. The extension increases the size of the current exclosure from approximately ¼ acre to 2.17 acres in size.

Vegetation

Vegetation in the Conde Creek Allotment is primarily conifer forest (mixed fir and white fir) with areas of hardwood, shrubland, and grasslands. Cattle graze meadows and harvested forest openings within a matrix of varied conifer communities. Plant communities vary in the Conde allotment from mixed-conifer stands of varying ages to open meadows with heavy riparian influences and grass-dominated herbaceous communities. Dry uplands are dominated by pine species and incense cedar (*Calocedrus decurrens*). Manzanita species (*Arctostaphylos* species) are present in some areas, as well.

The conifer-dominated forests, comprised primarily of white fir, ponderosa pine, Douglas fir and incense cedar (*Abies concolor*, *Pinus ponderosa* and *Psuedotsuga menziesii*), generally have low-to-moderate levels of herbaceous species (forbs) present, and moderate-to-high shrub cover, depending both on age of the stand and the aspect. Dominant species of forbs in mature (mid- to late-seral) conifer stands include prince's pine (*Chimaphila sp*.), inside-out flower (*Vancouveria hexandra*), broadleaf starflower (*Trientalis latifolia*), Scouler's hairbell (*Campanula scouleri*), Pacific trillium (*Trillium ovatum*) and fairy bells (*Disporum hookeri*). Dominant shrubs can include hollyleaved barberry (*Mahonia aquifolium*), common snowberry (*Symphoricarpos albus*) and wild currants (*Ribes* sp.). Younger conifer stands are often dominated by Douglas fir, ponderosa pine and incense cedar, with common snowberry, oceanspray (*Holodiscus discolor*), wild currants and Cascade barberry (*Mahonia nervosa*) often comprising the dominant shrubs. Herbaceous cover in these harvested units is usually sparse and grass-dominated (native and non-native).

Riparian areas are a mix of open meadows with riparian influence (ponds, seasonal and perennial wetlands) and drainages that reflect more of a conifer-dominated plant-community (i.e. seasonal and perennial creeks, seeps). The open meadows are primarily shrub and grass-dominated during grazing season, with grass species including California oatgrass (*Danthonia californica*), Kentucky bluegrass (*Poa pratensis*), Idaho fescue (*Festuca idahoensis*) and bulbous bluegrass (*Poa bulbosa*). Shrub species can include common snowberry, rose spiraea (*Spiraea douglasii*) and wild currant. Scattered conifer species can be found in most meadow areas, primarily on the periphery, and can include Douglas and white firs, ponderosa pine and incense cedar.

Non-native annual and perennial grass species can be found throughout much of Conde allotment, including smooth brome (*Bromus hordeaceous*), cheat grass (*Bromus tectorum*), dogstail (*Cynosurus echinatus*), ripgut brome (*Bromus diandrus*), bulbous bluegrass (*Poa bulbosa*) and medusahead rye (*Taeniatherum caput-medusae*). Broadleaved weeds that occur within the allotment include Himalayan

blackberry (*Rubus discolor*), bull thistle (*Cirsium vulgare*), Klamath weed (*Hypericum perforatum*) and Canada thistle (*Cirsium arvense).* Survey records indicate that the non-native grasses can be found primarily in meadows (dry, wet and semi-wet), clearings and roadsides, while the broadleaved species are generally near existing roads.

Soils

The soil series found on this allotment are the Bybee, Farva, Kanutchan, McMullin, McNull, Medco, Pinehurst, Sibannac, Tatouche, and Woodseye. These soils are found on slopes ranging from 6 to 60 percent. A brief description is found below and a map displaying the location of the soils on the landscape is on file in the Medford District office.

The Bybee soil is very deep and somewhat poorly drained. It formed in colluvium derived dominantly from andesite, tuff, and breccia. Permeability is very slow and available water capacity is about 9 inches. The effective rooting depth is limited by a dense layer of clay at a depth of 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The water table, which is perched above the layer of clay, is at a depth of 1 to 3 feet from December through May.

The Farva soil is moderately deep and well drained on hillslopes. Permeability is moderately rapid and available water capacity is about 3 inches. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate.

The Kanutchan soil is deep and somewhat poorly drained in basins. Permeability is very slow and available water capacity is about 7 inches. The effective rooting depth is limited by the water table, which is within a depth of 1.5 feet from December through May. Runoff is slow, and the hazard of water erosion is slight.

The McNull soil series is a moderately deep and well-drained soil on hillslopes. It formed in colluvium derived dominantly from andesite, tuff, and breccia. 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 on slope less than 35 percent and high on slopes over 35 percent.

The McMullin soil is shallow and well drained. Permeability is moderate and available water capacity is about 2 inches. The effective rooting depth is 12 to 20 inches. Runoff is slow or medium, and the hazard of water erosion is slight or moderate. Rock outcrop consists of areas of exposed bedrock and runoff is very rapid in these areas.

The Medco soil series is a moderately deep and moderately well drained soil 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 or rapid, and the hazard of water erosion is moderate or high. The water table, which is perched above the layer of clay, is at a depth of 0.5 foot to 1.5 feet from December through March.

The Pinehurst soil series is a very deep and well drained soil on plateaus. Permeability is moderately slow and available water capacity is about 10 inches. The effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight.

The Sibannac soil is a very deep and poorly drained soil in basins. Permeability is moderately slow and available water capacity is about 12 inches. The effective rooting depth is limited by the water table, which is within a depth of 1 foot from January through June. Runoff is slow, and the hazard of water

erosion is slight.

Tatouche - Permeability is moderately slow in the Tatouche soil. Available water capacity is about 8 inches. The effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is moderate on slope less than 35 percent and high on slopes greater that 35 percent.

The Woodseye soil is shallow and somewhat excessively drained. It formed in colluvium derived dominantly from andesite. Permeability is moderate in the Woodseye soil. Available water capacity is about 1 inch. The effective rooting depth is 10 to 20 inches. Runoff is slow or medium, and the hazard of water erosion is slight or moderate. Rock outcrop is intermixed with the Woodseye soil on the landscape consists of areas of exposed bedrock. Runoff is very rapid in these areas.

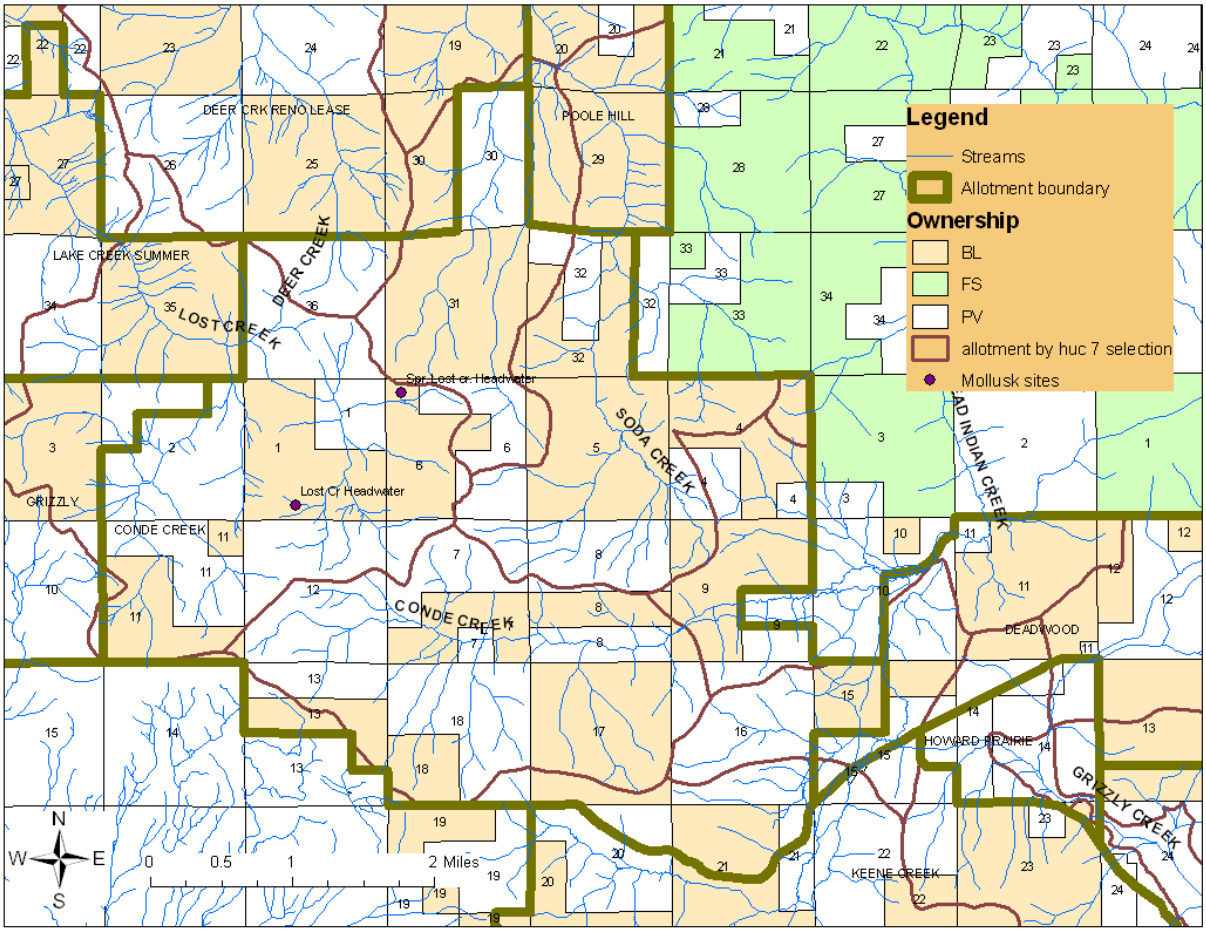
The Bybee and Medco soil have perched water tables often into May so range readiness could be affected on wetter than normal years. These series along with Tatouche have clay loam and clay soil textures on which cattle can have serious detrimental affects when saturated with water. The McMullin soil is a shallow soil that is often associated with Rock outcroppings which limits the available water for plant growth. The shallow soils have low water holding capacity and limits site productivity.

Areas of concern for livestock are primarily localized areas of compaction and disturbance in riparian meadows. Some of the soils that remain wet later in the season exhibit a weak compaction layer and in drainages where the surrounding areas are dominated by annual grasses the soils surface resistance to erosion is lower than would be expected in the fir forest and pine fescue ecological sites (USDI 2007b).

Hydrology

This allotment encompasses the headwaters of several drainages: Lost Creek, Deer Creek, Soda Creek, Conde Creek, Dead Indian Creek, and a sliver in the Walker Creek drainage. Lost, Deer, and Soda Creeks are tributaries to South Fork Little Butte Creek and Conde Creek is a tributary to Dead Indian Creek (Map 1). Walker Creek is a tributary to Bear Creek. Within the allotment boundary, there are 19 miles of perennial streams, 31 miles of intermittent streams, and 30 miles of dry draws. Elevation within the allotment ranges from 3000 feet to 5500 feet. Rain predominates in the lower elevations (below 3,500 feet) with the majority occurring in the late fall, winter, and early spring. A mixture of snow and rain occurs between approximately 3,500 feet and 5,000 feet and this area is referred to as either the rain-on-snow zone or transient snow zone (USDI 2000:19). Talent Irrigation District (TID) diverts water from Conde and Dead Indian Creeks into Howard Prairie Reservoir.

Map 1. Allotment Boundary and Ownership

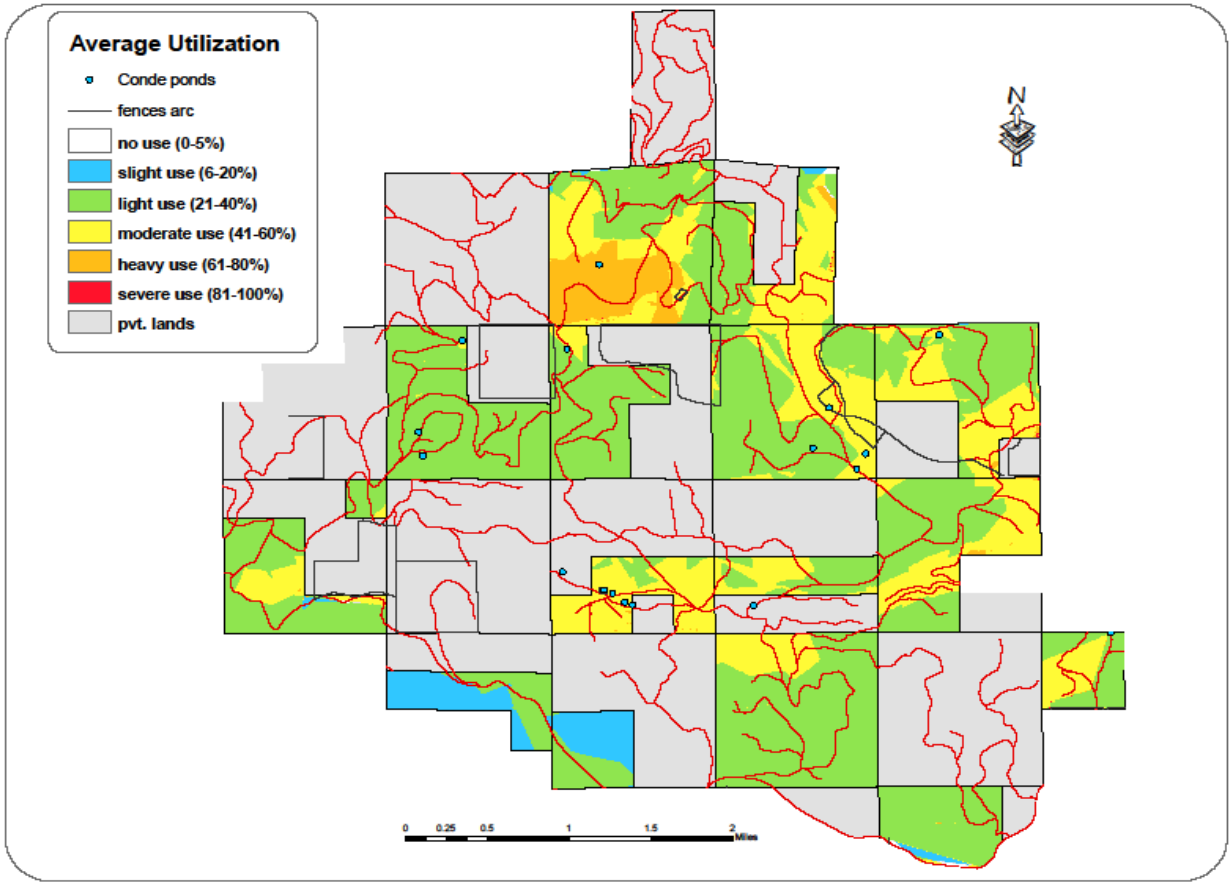


Utilization Data, Transect Data and Actual Use

Utilization data is collected using the key species method and mapping use zones (TR 4400-3, 1996). A seven class delineation is used (No Use: 0-5 percent, Slight Use: 6-20 percent, Light Use: 21-40 percent, Moderate Use: 41-60 percent, Heavy Use: 61-80 percent, Severe Use: 81-100 percent). A composite map depicting average utilization was created using data collected (1984-2003) for the Conde Creek allotment to illustrate the use over time within the allotment (Map 2). In 2006, heavy utilization occurred on approximately 160 acres of the allotment (or 3%), but was disproportionately located on meadow/grassland vegetation types. In 2014, despite being a severe drought year, heavy utilization is estimated to have occurred on approximately 36 acres (or less than 1%).

Utilization mapping and transect data collected show an overall decrease in utilization comparing 1984-2003 data with utilization in 2006 and 2014. The trend since 1984 has been a decrease in the amount of heavy utilization. The major variables defining utilization include proximity to water, roads, and elevation. Utilization patterns depict the transition from summer to fall grazing when uplands are drier and grazing becomes concentrated in riparian areas (Hosten et al. 2007a).

Map 2. *Map of Average Livestock Utilization in the Conde Creek Allotment 1984-2003*



Current stocking rates have been reduced since the 1970s and the stocking rate is currently lower than permitted use (Figure 1). Data from 2009-2014 indicates stocking rates similar to 2004-2008. Permitted use is the number of AUMs authorized in the *Medford District Resource Management Plan* (1995).

Figure 1. *Actual Use Data*

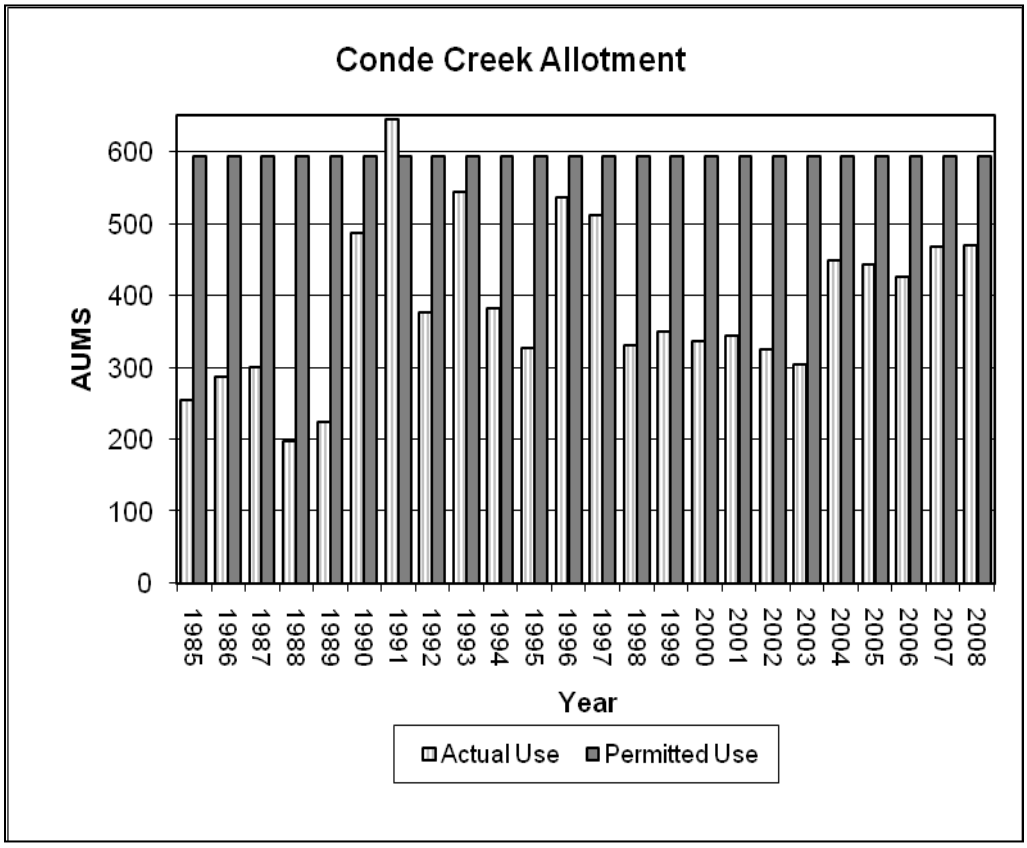
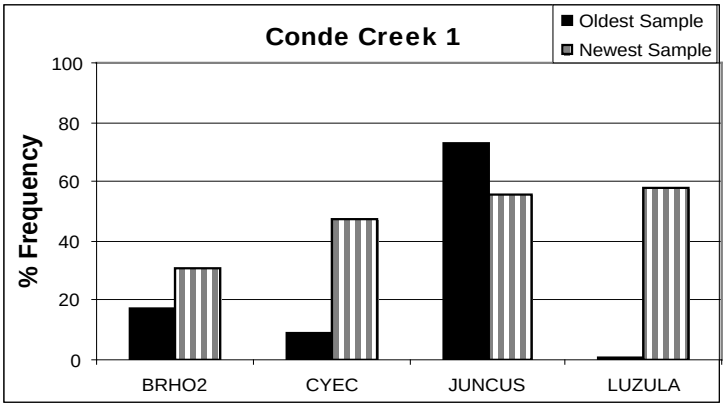
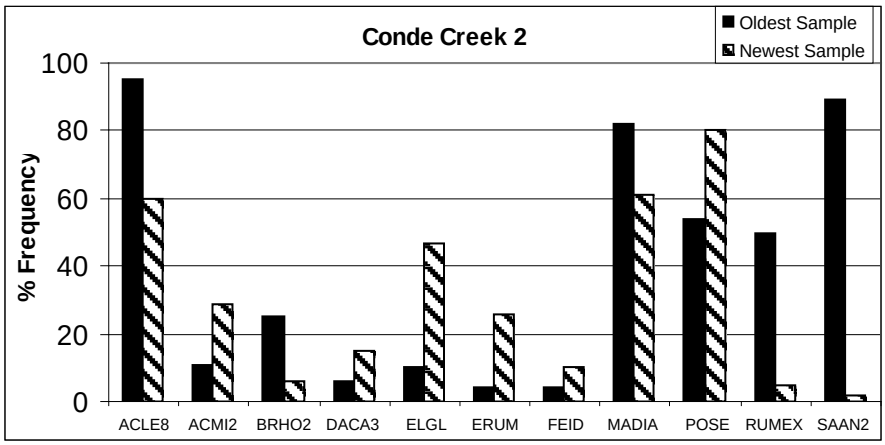


Figure 2. *The collection of trend data using the Nested Frequency Method was collected at the transect in 37S 3E section31 in 1996, 2001, and 2006.*



Species showing significant change include a decrease in a *Juncus sp.* and an increase in a *Luzula sp.* these species are native, perennial grass-likes. Other species showing changes include an increase in soft brome (*Bromus hordeaceous)* and bristly dogstail *(Cynosurus echinatus)* these species are non-native, invasive, annual grasses. The condition of this site is showing a downward trend because of the invasion of non-native annual grasses.

Figure 3. *The collection of trend data using the Nested Frequency Method data was collected at the transect in 38S 3E section 7 in 1990, 1995, and in 2006.*



Species showing significant change include Lemmon's needlegrass (*Achnatherum lemmonii)*, California oatgrass (*Danthonia californica)*, blue wildrye (*Elymus glaucus)*, Idaho fescue *(Festuca idahoensis)*, and Sandberg bluegrass (*Poa secunda)* these species are native, perennial bunchgrasses. A non-native, invasive, annual grass species with a decrease in frequency is soft brome (*Bromus hordeaceous).* Forbs showing a significant change include an increase in perennial native forbs such as common yarrow (*Achillea millefolium)*, and sulphur-flower buckwheat (*Eriogonum umbellatum)*, and a decrease in annual native forbs such as tarweed (*madia sp.)*, dock (*Rumex sp.)* and prairie burnet (*sanguisorba annua).* The condition of this site is showing an upward trend because of the increase in native perennial grasses and forbs and the decrease of a non-native annual grass.

Land Ownership

BLM manages 47 percent of the analysis area associated with the Conde Allotment. Private lands encompass 53 percent of the analysis area, and include land owned by industrial forest companies, residential landowners, and cattle ranches.

ASSESSMENT

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 Conde Creek Allotment using information derived from rangeland field assessments: the Livestock Impacts Study, 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

Data used by the BLM to support this assessment includes, but is not limited to, the following studies and monitoring projects.

The 5,346-acre allotment lies within the 238,598-acre Little Butte Creek Watershed, or 2.2% of its land area. The allotment lies within the 125,778-acre Water Quality Restoration Plan area, or 4.2% of that land area. Hence, unless the data from those documents show a site-specific connection to the allotment, there is a very low degree of influence from the allotment on the larger assessment areas.

Data specifically for the allotment includes:

Rangeland Health Field Assessments: Field assessments using the protocol described in *Technical Reference 1734-6: Interpreting the Indicators of Rangeland Health, ver. 4.0* (USDI and USDA 2005) were conducted August 22, 2006 at one site in each of five distinct ecological types on the Conde Creek Allotment: dry rocky meadow, semi wet meadow, wet meadow, Douglas fir forest, and pine fescue forest.

Periodic monitoring is conducted to ensure management objectives are met or moving toward meeting the *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*.

Trend monitoring using BLM protocol (TR 1734-4, 1999) consists of data collection at 2 established Nested Plot Frequency Transect study sites on approximately a 5-year interval.

Areas have been selected for conducting key upland forage species utilization studies. Methods currently used on the Conde Creek allotment are the Key Species Method, and Mapping Use Zones using BLM technical reference *Utilization Studies and Residual Measurements* (Cooperative Extension Service et al. 1999).

Monitoring occurs at riparian areas of concern; currently evaluated as *Functioning at Risk with a Downward Trend* or *Not Functioning* as well as other riparian areas that are currently evaluated as *Functioning at Risk with an Upward Trend* or *Properly Functioning*. Monitoring sites have been chosen in the field, in cooperation with the lessees at the end of the grazing season in 2012. These monitoring sites are established following the Multiple Inventory Monitoring (MIM) protocol and are utilized to monitor streambank alteration, stubble height and streambank stability and cover.

Hydrologic/Riparian, Habitat, and Photo Point Surveys: Hydrologic/riparian surveys are conducted using the Ashland Resource Area Stream Survey Protocol. Location, flow duration, channel classification/morphology data for streams, wetlands, and other hydrologic features; instream large wood; impact descriptions and restoration opportunities, especially related to livestock, transportation, and vegetation throughout the allotment is collected. Properly functioning condition (PFC) is assessed during the surveys. These BLM stream surveys were completed for Lost Creek (1998), Conde Creek (1995), and Soda Creek (1995 and 1998). On BLM lands within the allotment ODFW collected habitat survey data in the Conde, Soda, Deer, and Lost Creek basins in 1991 - 1997. Photo point monitoring occurred at several sites in this allotment (BLM 2003-2008).

Baseline Stream Temperature Monitoring: Seasonal 30-minute interval stream temperature data is collected at four long-term monitoring sites within this allotment using USGS and Oregon DEQ-established methodologies. Additionally, stream temperature data has been collected at two other shorter-term sites.

Stream Channel Cross Sections: Stream cross-section measurements are collected at two monumented sites in this allotment. Measurement methodologies include standard cadastral survey techniques and those outlined in Rosgen (1996). Sites are measured at five-year intervals (approximately) and after major flood events. Cross-sections provide a reference point from which to document changes in channel morphology, conduct flow measurements, and estimate flood flows. Documentation of changes in channel morphology provides an indication of stability and functioning of the upstream surface hydrologic system.

Botany Surveys: Botany surveys were conducted within the Conde Creek Allotment using the Intuitive Controlled Survey and for various project types, including proposed timber sales, and fuels and silviculture projects. 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. 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 is made.

Surveys conducted within the allotment area in 2004-2009 have primarily been focused in areas that were in consideration for timber management activities (timber sales, silviculture and fuels treatments) and have generally excluded the meadows and other open riparian areas. Landscape level surveys were conducted across the allotment area in 1998-1999, providing valuable information on landscape conditions, plant communities, ecotypes and sensitive plant populations.

Wildlife Surveys: Surveys have been conducted in various parts of the allotment for northern spotted owl, butterflies, small mammals, fisher, birds (including Neotropical migrants), and Siskiyou short-horned grasshoppers using the appropriate survey protocols. Also the Oregon Department of Fish and Wildlife has conducted black-tailed deer trend counts.

Data partially or wholly outside of the allotment includes:

Aquatic Macroinvertebrate Monitoring: Macroinvertebrate monitoring was conducted by Aquatic Biology Associates at one site within and two downstream of this allotment using methods that meet or exceed state or EPA protocols for the sampling of benthic macroinvertebrates. Three springs in the Conde Creek Allotment were sampled for aquatic mollusk presence, species data, and livestock impacts (Frest and Johannes 2005, USDI 1999-2006).

Livestock Impacts Studies: This collection of reports includes studies that provide a historic and spatial context to the examination of individual plant and wildlife species. Historic anecdotes and photos provide a glimpse of vegetation condition at the time of Euro-American settlement and the remainder of the 19th century. More recent plot (range trend plots) and stand examinations (derived from Natural Resources Conservation Service and Soil and Vegetation Inventory Method) provide a baseline for re-examining change over the past 30 years. Other studies focus on the distribution of weeds, native ungulates, and aquatic macroinvertebrates. These studies are considered within the larger context of patterns in topography, vegetation, soils, past management, and utilization by native and non-native ungulates. Two factors allow the BLM to use the results of the Livestock Impact Studies beyond the Cascade-Siskiyou National Monument:

1) A few of the studies extended beyond the monument boundaries (riparian exclosure project) by virtue of having widely dispersed observations, and
2) Other studies are of regional significance, allowing the extrapolation of results beyond the monument boundaries within areas of similar environmental character.

Standard 1: Watershed Function – Uplands

To meet this standard, upland Soils exhibit infiltration and permeability rates, moisture storage, and stability that is 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.

Indicators Used to Evaluate this Standard

A set of indicators has been identified for which site-specific criteria will be used to determine if this standard is being met.

Amount and distribution of bare ground, rock, stone, gravel, plant litter, and plant cover—

Upland sites with bare soil consequent to past disturbance (livestock, and road construction) show less bare soil and succession towards perennial plant domination. Livestock exclosure studies indicate the relation between livestock use and bare ground is dependent on the predominant grass (Hosten unpubl.).

Sod-forming grasses such as California oat grass may increase with grazing pressure, while bunchgrasses decline in canopy cover to reveal more bare soil.

The three ecological RHFA sites within this allotment that represent the uplands (dry rocky meadow, fir forest and pine/fescue) showed levels of bare ground consistent with what would be expected at those ecological sites, with none-to-slight departures (USDI 2007b).

Plant litter amounts at these same three ecological sites showed varied results. In the dry rocky meadow and pine/fescue sites, there is a documented slight-to-moderate departure, and a none-to-slight departure in the fir forest (USDI 2007b).

Plant cover within these three ecological sites can be a measure of composition or production. Indicator 15 (Annual Production) indicates that there is a none-to-slight departure within the fir forest ecological site, while the dry meadow and pine/fescue sites indicate that there is a slight-to-moderate departure from what would be expected at those ecological sites. Regarding Indicator 17 (Invasive Plants), which is a component of plant community composition; there is a slight-to-moderate departure in both the fir forest and the pine/fescue ecological sites, and an extreme departure in the dry rocky meadow. (USDI 2007b). This is presumably due to the expected lower production rates in this ecological type, and the vulnerability to invasive species such as medusahead rye, bulbous bluegrass and bristly dogtail. Plants need time for growth, seed development and storage of carbohydrates to remain vigorous and productive.

Continued grazing during the plant's regrowth period eventually causes roots to die back, the plant to lose vigor, and seed development to cease. The result can be a change in plant community, usually from more productive, more palatable species to a less productive and less palatable group of plants. (USDI 1998)

Studies indicate that livestock strongly influenced vegetation at the end of the 19th and early 20th centuries when stocking rates were ten times higher than the current (Hosten et al. 2007a). Before the introduction of annual grasses, perennial bunchgrasses were the primary native species in rangelands in the West (DiTomaso 2000). Studies also show that many plant communities are still recovering from past livestock-induced annual grass domination (Hosten et al. 2007d). Perennial grass species do not have high seedling vigor, and do not readily recover from grazing (DiTomaso 2000). More recent invasion by bulbous bluegrass (introduced as a consequence of range seedlings) and its preference for gentle slopes is an indirect measure of livestock influence on bulbous bluegrass invasion (Hosten et al. 2007d). Cheat grass (*Bromus tectorum*), another nonnative grass (annual), is the most dominant weed species in the intermountain west, occupying an estimated 40 million hectares. Cheat grass can be used as livestock forage, but in some years it provides only 10% of the productivity of the perennial species it replaced (DiTomaso 2000). Although early-season non-native grass species are not showing a strong upward trend in the nested frequency data (data historically gathered in late summer), early-season (May, early June) field visits and observations by specialists indicate that both bulbous bluegrass and cheat grass are often prevalent in open areas with slight-to-moderate slopes in the upland areas.

Accelerated erosion and overland flow—

Rainfall in this allotment allows for the maintenance of sufficient vegetation cover to minimize erosion and overland flow. There is some concern with the amount of litter protecting the soil particularly in areas where annual grasses are the dominant species. In the RHFA, there are six indicators pertaining to erosion: four sites showed a departure from the ecological site description. The dry rocky meadow and the wet meadow ecological sites were rated as having a slight-to-moderate departure for water flow patterns. The pine fescue ecological site was rated as having a slight-to-moderate departure for soil surface loss or degradation. The pine fescue and fir forest ecological sites were rated as having a slight-to-moderate departure for soil surface resistance to erosion (USDI 2007b).

Root occupancy in the soil profile—

The general trend in herbaceous vegetation from annual domination towards perennial vegetation (Hosten et al. 2007d) signifies improved root occupancy of the soil profile through much of the Allotment.

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.

Indicators Used to Evaluate this Standard

Site-specific criteria from the following set of indicators will be used to determine if this standard is achieved. The criteria are based upon the potential (or upon the capability where potential cannot be achieved) of individual sites or land forms.

Frequency and duration of soil saturation—

The frequency and duration of flooding are controlled by topographic position and site condition, seasonal rainfall patterns, and influence of beaver. Exclosure studies indicate high livestock use can impede the development of willow stands (Hosten 2007b). Existing willow and aspen stands show little recruitment from year to year except where cattle have been excluded. Channel downcutting caused by riparian degradation lowers local water tables and reduces the volume of base stream flow during the critical summer period. Within the Conde Allotment there are 24.6 acres of riparian woodlands on BLM lands, which are assumed to be primarily aspen and willow stands.

Water diversions and impoundments—

Talent Irrigation District (TID) diverts water from Conde and Dead Indian Creeks into Howard Prairie Reservoir. Only the Conde Creek diversion is within this allotment (T38S R3E Section 9) however both diversions are unscreened allowing fish from the Howard Prairie Reservoir access to both Dead Indian and Conde Creeks. It is suspected that populations of Klamath speckled dace (*Rhinichthys osculus*) were introduced from Howard Prairie Reservoir into the South Fork of Little Butte Creek through this

diversion ditch. The Conde Creek diversion, located upstream of Owens Prairie (T38S R3E Section 9), is a barrier to upstream migrations in most flow conditions and dewaters the stream channel during much of the irrigation season.

Proper Functioning Condition—

The BLM uses a proper functioning condition (PFC) assessment to determine the condition of riparian areas on perennial and intermittent streams. PFC is a qualitative method based on quantitative science (USDI 1998). This assessment considers hydrology, vegetation, and erosion/deposition attributes and processes to evaluate the condition of riparian areas. It can often serve as a surrogate indicator for all the listed parameters. The assessment places riparian areas into one of four categories: proper functioning, functional-at risk, nonfunctional, or unknown. The functional-at risk category is further defined by a trend: upward, downward, or not apparent.

PFC assessments were conducted during BLM stream surveys (1995, 1998) in Conde (1995), Lost (1998), and Soda (1995 and 1998). Not all streams within the allotments were surveyed for PFC. Therefore, it should be noted that the data in Table 3 is not inclusive of all stream miles. Only perennial and intermittent streams are assessed for PFC. For all stream miles evaluated within the allotments for PFC, approximately half were characterized as either functioning properly or functioning at risk with an upward trend.

PFC assesses the condition of any riparian-wetland area that provides enough available water to the root zone to establish and maintain riparian-wetland vegetation. PFC is a measure of functionality, not a process to determine the causes of non-functionality; the PFC assessment can document if particular habitat indicators are compromised, but it does not necessarily determine why/how/when indicators are being compromised. However, several facts point to livestock grazing likely contributing to non-functionality. The season of use on this allotment (June16 – September 30) coincides with the end of the growing season. This allows cattle to access riparian areas into the early fall, allowing no time for plant regrowth or bank stabilization prior to winter rains. In addition, cattle tend to linger and congregate in riparian areas throughout the entire grazing season because of convenience of forage, water, and shade.

Table 1. Proper Functioning Condition Assessment for Stream Reaches on BLM-Administered Lands within the Allotment.

Stream Name	Stream Miles Assessed	Proper Functioning Condition (% of assessed miles)	Functional-At Risk, Trend Upward (% of assessed miles)	Functional-At Risk, Trend Not Apparent (% of assessed miles)	Functional-At Risk, Trend Downward (% of assessed miles)	Nonfunctional (% of assessed miles)
Dead Indian Creek	1.0	-	-	-	70	30
Lost Creek	2.0	55	39	-	6	-
Soda Creek	8.1	24	15	13	29	19
Conde Creek	5.5	31	28	8	30	3

Streambank/shoreline stability—

Active bank erosion is contributing fine sediment to all the streams in this allotment. ODFW surveys (1991-1997) found actively eroding streambanks along 69% of Soda Creek reaches within the allotment. In Conde Creek, active erosion was observed along 16% of the stream length surveyed (3,736 feet) within the allotment (ODFW 1991-1997). Stream surveys (BLM 1995 and 1998) found actively eroding streambanks along 55% of surveyed reaches in Conde Creek, 34% in Soda Creek, and 46% in Dead Indian Creek. Streambank alteration (Cowley and Burton 2004) measurements of 33-49% were observed

at two sites along Conde Creek and one site along Soda Creek in 2005. These studies did not determine the specific causes of streambank alteration. However, repeated field observations show active erosion occurring along many of the perennial stream banks as a result of grazing (BLM 2003-2008) (though there may be other factors not related to livestock grazing that were not identified in the field observations). Focused cattle use along perennial seeps, springs, and channels in the late summer and early fall contribute to bank disturbance and streamside vegetation consumption leaving stream channels and banks vulnerable to seasonal high flow events and subsequent sediment increases and channel widening. While this sediment would be mobilized at a time when turbidities are naturally elevated, exposed and disturbed banks would be susceptible to continued degradation throughout the winter months with no time for recovery post-grazing season.

Sediment deposition—

Fine sediment (sand, silt, clay) exceeded the PFC benchmark of greater than 20 percent fines (Klamath Province/Siskiyou Mountains Matrix of Factors and Indicators) for the following streams: Conde Creek (46 percent) and Soda Creek (67%) (ODFW 1991-1997). High levels (45%) of fine substrate were also observed in the headwaters of Lost Creek (BLM 1995 and 1998). Soda and Lost Creeks are listed by Oregon Department of Environmental Quality (ODEQ) for exceeding sediment standards.

The common observation of cattle caused post holing and bank shearing and the corresponding siltation in seeps, springs, streams and ponds on the Conde Creek Allotment indicates bank destabilization and sediment transport along watercourses. This has been observed repeatedly along most perennial water courses in the allotment over the last 10 years (2000-2009) by BLM hydrology and fisheries staff. Flood events also contributed to general bank erosion.

Upland watershed conditions—

The major influences on upland condition that impact riparian condition are livestock grazing, road density, and logging.

Amount and distribution of plant cover—

Long term trends documented in repeat photos show bare ground replaced by vegetative cover (Hosten and Whitridge 2007). More recent field observations (BLM 2003-2009) indicate that areas of high forage use by livestock have more bare ground than less utilized sites. This is supported by PFC surveys. Streams and seeps still show considerable disturbance by native and non-native ungulates (Hosten 2007b, Hosten and Whitridge 2007, BLM 2003-2008).

Stubble height—

Interdisciplinary teams have identified multiple riparian areas where stubble heights do not meet the heights recommended in the literature. For recovery of depleted meadow riparian systems, ten to fifteen centimeters (4-6 inches) of forage stubble height should remain on streamside areas at the end of the growing season, or at the end of the grazing season after fall frost, to limit potential impacts to the herbaceous plant community, the woody plant community, and streambank stability (Clary 1999). In other situations, fifteen to twenty centimeters (6-8 inches) of stubble height may be required to reduce browsing of willows or limit trampling impact to vulnerable streambanks (Clary and Leininger 2000). According to Hall and Bryant (1995), cattle preference will shift to woody vegetation as stubble height for the most palatable species (Kentucky bluegrass) approaches three inches but in sedge and rush communities the shift will happen earlier and six to nine inch stubble heights may be more suitable (Marlow pers. comm. 2003). Along accessible, perennial waters in this allotment, stubble heights are

generally less than two inches by the end of the grazing season (BLM photo point monitoring 2003-2008).

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.

The focus of this standard is on the ecological processes of energy flow and nutrient cycling as influenced by existing plant and animal communities. Standard 5 specifically addresses plant and animal species.

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.

Indicators Used to Evaluate this Standard

A set of indicators has been identified for which site-specific criteria will be used to determine if this standard is being met.

Accumulation, distribution, and incorporation of plant litter into the soil—

Litter accumulation in upland areas is thought to conserve soil moisture within the soil profile, protect the soil surface from raindrop impact, and help prevent the establishment and persistence of broadleaved weeds with winter rosettes. A litter layer and competition by winter annual seedlings may also prevent the establishment and persistence of native grasses, forbs, and rare plants (Frost and Hosten 2007). Three of the sites analyzed as part of the RHFA had litter amounts below the expected percentage due to the high abundance of annual grass. Of the 5 ecological sites visited in this allotment, litter amount (Indicator

14) showed a slight-to-moderate departure in the dry rocky meadow, wet meadow, and pine/fescue sites. This may be attributed to the departures in Indicator 16 (Invasive Plants) in all three of these sites, with the inclusion of non-native annual grasses as "invasive plants." The fir forest and semi-wet meadow sites showed departures of none-to-slight from what is expected at these sites (USDI 2007b).

Wildlife community structure—

While livestock influence deer and elk movement, it is not known if this alters native ungulate community structure or population beyond the constraints of suburban and agricultural expansion into former deer and elk winter range. While richness and diversity of small mammals is not influenced by livestock grazing in riparian, woodland, and mixed conifer communities, small mammal biomass is less in moderate to severe utilization levels versus ungrazed or lightly grazed areas (Johnston and Anthony. In review a, b).

Ungulate use appears to lead to an increase in abundance of ground nesting birds, but may not favor overall reproductive success by these species. This may result from a decrease in the cover of shrubs which provides more nest sites for ground-nesting birds. Ungulate use has a negative influence on abundance of shrub-nesting birds including migratory neo-tropical birds (Alexander et al. 2008). It is not known if the increased abundance of shrubs found in formerly open, fire-mediated plant communities (Hosten et al. 2007c) compensates for livestock influence on shrub-nesting bird species

Ungulate utilization has been shown to negatively influence butterflies with grass host plants (Runquist In prep.).

Aquatic community structure—

This system experiences reduced connectivity from road-stream crossings, irrigation withdrawals, and a diversion dam. Migration of aquatic organisms is particularly restricted on Conde Creek at the TID diversion dam site.

Plant composition and community structure—

Plant community structure can be described in two levels: plant series and plant association. Series is assigned by determining which species comprise "the dominant, most shade-tolerant, regenerating tree species on the site…Plant associations are described primarily by the presence or absence, or abundance of plant species" (USDA 1996). Plant series found within the Conde Allotment uplands and forested areas include the Douglas Fir, Ponderosa Pine and White Fir series, and associations within the allotment are generally within these series (e.g. PSME-PIPO, PIPO-PSME or ABCO-BENE2). Dominant shrubs and forbs vary within these areas, depending on canopy cover, soil type, slope, aspect and elevation. Dominant shrubs include thimbleberry (*Rubus parviflorus*), snowberry, wild currants and rose species (*Rosa sp*). Common early-season forbs include white inside-out flower (*Vancouveria hexandra*), anemone (*Anemone* sp), Pacific woodrush (*Luzula comosa*), wakerobin species and sweetcicely (*Osmorhiza chilensis*). Later season forbs can include inside-out flower, Pacific woodrush, sweetcicely, wild strawberry (*Fragaria vesca*) and native and non-native graminoids.

Regarding conifer-dominated sites, the Rangeland Health Assessment Summary of Findings indicates that, within the Pine/Fescue Ecological Site, there was a Slight to Moderate departure in 7 of the 17 indicators, including those indicators related to plant community and composition, functional/structural groups, annual production and invasive plants. The Fir Forest Ecological Site had a Slight to Moderate departure due to the presence of dog tail (*Cynosurus echinatus*) and soft brome (*Bromus hordeaceus*), which have colonized these areas following disturbance. (It should be noted that these two species are not

early season species. This data may not accurately account for the presence of bulbous bluegrass or other early season introduced non-native species that may or may not affect degrees of departure findings.)

Meadows are also found in many areas. Within the Conde Allotment, there are an estimated 327 acres of meadows, hardwoods, and shrublands (which represent those areas most likely to contain suitable browse for cattle) out of 5347 acres of BLM lands (8%). There are 959 acres of Riparian Reserves (18%) within the allotment, and meadows, hardwoods, and shrublands comprise 18% of the Riparian Reseves (data from GIS Veg Condition information). Because these areas do not generally have widespread regenerating dominant tree species, they are not described in the *Field Guide to the Forested Plant Associations of Southwestern Oregon*, and therefore cannot be classified in this same manner. Plant composition in meadows varies in relation to the season and the proximity to water. Early season forbs in the wet areas include a mix of California false hellebore, Howell's yampah, early-season willow species (*Salix* sp), timothy, straightbeak buttercup (*Ranunculus orthorhyncus*), water sedge (*Carex aquatalis* var *dives*), checker lily (*Fritillaria affinis*) and bigleaf lupine (*Lupinus polyphyllus*). Early season forbs in the drier areas adjacent to the riparian zone include small camas (*Camassia quamash*), larkspur (*Delphinium* sp), slender cinquefoil (*Potentilla gracilis*), bulbous bluegrass, cheat grass, timothy and narrow-leaf blue-eyed Mary (*Collinsia linearis*). Perennial grass species include California oatgrass (*Danthonia californica*), Lemmon's needle grass (*Achnatherum lemmonii*), Idaho fescue (*Festuca idahoensis*), and Sandburg bluegrass (*Poa secunda*).Shrub cover in both areas described is sparse, occurring in higher densities in the understory of the upland coniferous stands or in open upland areas. Scattered trees may occur within these meadows, but they tend to be individuals or small groups, and are generally ponderosa pine, Douglas fir or white fir. There are also populations of quaking aspens (*Populus tremuloides*) in some of the meadows, and measures have been taken (in some instances) to prevent herbivory of these populations through the establishment and upkeep of exclosure fences around several small aspen groves Additionally, young aspen were planted in 2008 adjacent to upper Soda Creek, and a small exclosure erected around the seedlings. Survival of seedlings was poor, and to date only a few are left.

The wet meadow and semi-wet meadow sites measured slight-to-moderate departures in Indicator 17 (reproductive capability of perennial plants). This response could potentially be attributed to a number of factors, and cannot assuredly be attributed to the presence of ungulates on the Conde Creek Allotment. Possible factors (other than herbivory) could include litter accumulation or a natural variation due to shifting weather patterns. However, numerous studies relating perennial reproductive success and herbivory have been conducted, with results indicating that plants can be negatively affected by herbivory by displaying a reduction in reproductive potential, limited distribution and a modified competitive ability. Herbivory can have varied effects on a plant's compensatory abilities, ranging from overcompensation to undercompensation, depending on the conditions determining the plant's ability to replace tissue consumed by herbivores. The strongest factor in determining the compensatory ability, according to Maschinski and Whitham, is the timing of herbivory. In a three-year study, plants grazed later in the growing season produced significantly fewer fruits than did ungrazed plants, thus reducing their reproductive success (Maschinski and Whitham 1989).

The Rangeland Health Assessment Summary states the following regarding dry meadow health within the Conde Allotment:

> The dry meadows are generally less productive and more vulnerable to invasive plant influences from species including medusahead rye, annual bromes, bristly dogstail, yellow starthistle, and a variety of other weedy species. 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. Annual grassland furthermore often accumulates a layer of thatch where decomposition and nutrient cycling are different than in native plant communities. Current livestock grazing is not considered a significant contributing

> factor in the rangeland health decline on these dry meadows. However, to improve conditions management tools such as seeding with native plants, herding, resting, and/or changing season of use should be analyzed. It is apparent from the Bureau's upland assessment that the dry meadows have suffered declines in plant productivity, distribution, and vigor. (USDI 2007b)

Studies indicate that livestock strongly influenced vegetation at the end of the 19th and early 20th centuries when stocking rates were ten times higher than the current (Hosten et al. 2007a). Studies also show that many plant communities are still recovering from past livestock-induced annual grass domination (Hosten et al. 2007d). Perennial grass species do not have high seedling vigor, and do not readily recover from grazing (DiTomaso 2000). More recent invasion by bulbous bluegrass (introduced as a consequence of range seedings) and its preference for gentle slopes is an indirect measure of livestock influence on bulbous bluegrass invasion (Hosten et al. 2007d). Although early-season non-native grass species are not showing a strong upward trend in the nested frequency data (data historically gathered in late summer), early-season (May, early June) field visits and observations by specialists indicate that both bulbous bluegrass and cheatgrass are often prevalent in open areas with slight-to-moderate slopes.

Studies also indicate that livestock are retarding the development of riparian vegetation associated with seeps and springs. Past conversion of seeps and springs to stockponds and their limited size result in livestock concentrations and consequent soil and vegetation impacts preventing recovery of seeps and springs (Hosten and Whitridge 2007).

Age class distribution—

The reproductive capability of perennial plants was reduced at two of the five sites analyzed (RHFA 2007).

Soil compaction—

The main effect that livestock grazing has on the soil resource is disturbance leading to increased erosion and increase in bulk density when cattle grazing occurs during wet soil conditions. Cattle can exert both beneficial and detrimental effects on a grazed area. The greatest detrimental concerns, perhaps, are the physical effects of treading (trample or crush underfoot).

The interaction of several factors determines the amount of potential soil damage that may result. Soil moisture content, soil physical properties, type of forage, stocking rate, and number of days grazed all interact greatly in creating treading damage. The most basic concept is that the application of weight (cattle) to soil which is wet, will compress more soil into smaller volumes, thereby increasing bulk density of soil (weight per unit volume). The effect of this compaction is a diminished volume of soil pore space in the plant rooting zone that can store oxygen and water.

Because the effect of treading is greatest at the soil surface, this can lead to decreased soil permeability of both air and water. Lowered rates of water infiltration may lead to higher rates of surface runoff during heavy rains and to greater soil erosion, a problem often related to overgrazing (Wells, 1997).

The nature of the forage can also affect the rate at which treading damage occurs. Established forages that have a prolific rooting system in the top 6 to 10 inches of soil (form a good sod), can absorb more treading energy than those forages that do not form a dense rooting mass, thereby slowing the rate at which soil damage can occur. 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. Annual grassland furthermore often accumulates a layer of thatch where decomposition and nutrient cycling are different than in native plant communities (Ehrenfeld, 2003).

The inability of riparian vegetation to extend beyond cut-banks within livestock exclosures constructed 10 to 20 years ago indicates that soil compaction may be a concern in heavily utilized riparian areas (Hosten 2007b; Hosten and Whitridge 2007). A wet meadow and semi wet meadow site had a weak compaction layer, not expected for the site most likely as a result of livestock utilization when soils are wet (USDI 2007b).

Fire—

While average fire-return interval is longer than immediately prior to settlement by Euro–Americans, the vegetation is still considered to be within the 'natural range of variability' at the stand-level.

Succesional processes—

Vegetation plots across the landscape show an increase in native perennial grass abundance. Annual production was less then what would be expected at two of the five sites analyzed (USDI 2007b).

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.

Riparian plant community structure influences water quality by shading, thus maintaining lower water temperature.

Indicators Used to Evaluate this Standard

A set of indicators has been identified for which site-specific criteria will be used to determine if applicable water quality standards are being met.

Direct measures of water quality—

Barr et al. (In prep.) found significantly lower water temperature and higher levels of dissolved oxygen in ungrazed versus grazed springs. Past conversion of seeps and springs to stockponds and the restricted area of lentic systems result in livestock concentrations and consequent soil and vegetation impacts preventing recovery of some lentic areas.

The Oregon Department of Environmental Quality (DEQ) is required by the federal Clean Water Act (CWA) to maintain a list of stream segments that do not meet water quality standards for one or more

beneficial uses. This list is called the 303(d) list because of the section of the CWA that makes the requirement. DEQs 2004/2006 303(d) list is the most recent listing of these streams (ODEQ 2006a).

As of the 2004/2006 Oregon 303(d) list there are five water quality listed streams that run through the allotment boundaries. Conde Creek and Dead Indian Creeks are listed (mouth to headwaters) as water quality limited for temperature. Deer Creek is listed (mouth to headwaters) as water quality limited for sediment. Soda Creek and Lost Creek are listed (mouth to headwaters) as water quality limited for and temperature and sediment. These streams ultimately drain into South Fork Little Butte Creek which is also on DEQ's 2004/2006 303(d) list for exceeding the summer temperature, *E. coli* and sedimentation criterion. Conde Creek is listed for temperature based on the 2004 listing criteria. Soda Creek, Lost Creek and South Fork Little Butte Creek are listed based on the 1998 list date temperature and sediment criteria. Deer Creek is listed based on the 1998 sediment criteria.

These streams ultimately drain into South Fork Little Butte Creek which is also water quality limited for exceeding the summer temperature, *E. coli* and sedimentation criterion. However, it is impossible to quantify the contributions of these pollutants resulting from management of the Conde Allotment on the South Fork Little Butte Creek, because pollutants stem from numerous other sources, are spatially distributed across the entire allotment and catchment, and are also temporally distributed throughout the year.

Temperature—

The Oregon water quality temperature standard that applies to drainages within the allotments was approved by EPA on March 2, 2004 and is found in OAR 340-041-0028 (4) (a-c) (ODEQ 2006). The most sensitive beneficial uses affected by excessive temperatures include resident fish and aquatic life, salmonid fish spawning, and rearing (ODEQ 2004:5).

There are a total of 7.3 stream miles listed for temperature (4.2 miles for summer temperature and 3.1 miles for year around temperature) in the allotment of which 4.4 miles (0.1 miles on Dead Indian Creek, 1.1 miles on Conde Creek, 1.0 miles on Lost Creek and 2.2 miles on Soda Creek) are on BLM-administered lands.

Stream temperature is influenced by riparian vegetation, channel morphology, hydrology, climate, and geographic location. While climate and geographic location are outside of human control, the condition of the riparian area, channel morphology and hydrology can be altered by land use. Human activities that contribute to degraded thermal water quality conditions include: agricultural activity; rural residential developments; water withdrawals; timber harvests; local and forest access roads; (USDI and USDA 1997). Timber harvest, roads, livestock grazing, and OHV use are the primary impacts specific to federally managed lands that have the potential to affect water quality conditions in the allotment.

The BLM collected summertime stream temperature data at locations within the South Fork Little Butte Creek watershed between 1994 and 2005 (Table 2). The 7-day statistics for all sites listed in Table 2 exceed the established 2004 temperature criteria. Perennial streams are designated as core cold-water habitat, therefore the seven-day-average maximum for these streams may not exceed 16.0°C (60.8°F) outside the salmon and steelhead period of spawning use. Prior to the 2004 list, the Oregon DEQ 7-day maximum listing criteria was 17.8°C (64.0°F).

Table 2. Temperature summary for selected streams within the allotment

Stream Name	Period of Record[1]	7-day Statistic (ave. for all years)	Range of 7-day Statistic	
			Minimum	Maximum
Dead Indian Creek (above Conde Creek)	94-01, 03-05	74.9	72.5	77.6
Conde Creek (above TID diversion)	94-97, 99-03, 05	72.1	69.2	74.0
Conde Creek @ lower BLM line, Sec. 9 NE1/4 SW1/4	98-01	73.6	73.1	74.8
Lost Creek (above Coon Creek)	95-96, 98-01, 03-05	70.1	64.8	72.8
Soda Creek (near South Fork confluence)	94-01, 03-05	67.7	63.6	70.4
Soda Creek at Section 5/32 line	98	73.3	73.3	73.3

1/ Temperature measured from June to September

The BLM administered lands along the assessed reaches of Conde and Lost Creek meet the target shade (Table 3). However, Soda Creek is currently below the target shade threshold. Of the 4.9 miles assessed for shade on Soda Creek, only the upper 0.8 mile is in need of additional shade. Existing shade on this upper reach is 12 percent and target shade is 80 percent. Current shade on the rest of Soda Creek is equal to the target shade.

Stream temperatures are on an upward trend (decreasing) on federal land as previously harvested riparian vegetation recovers. On non-federal lands, near-stream vegetation disturbance/removal and water withdrawals continue to adversely affect stream temperatures (ODEQ 2004).

Table 3. Percent-Effective Shade Targets for BLM-Managed Lands within or near the Allotment Boundaries (ODEQ 2004: Appendix A)

Stream	Tributary to	Stream Miles Assessed on BLM	Current Shade[1] (%)	Target Shade[1] (%)	Additional Shade Needed[2] (%)	Time to Recovery[3] (years)
Conde Creek	Dead Indian Creek	1.1	88	88	0	0
Lost Creek	South Fork Little Butte Creek	4.4	92	92	0	0
Soda Creek	South Fork Little Butte Creek	4.9	78	89	11	30

1/ Current shade and target shade refer to percent-effective shade defined as the percent reduction of solar radiation load delivered to the water surface. Shade values are averages for all BLM stream miles assessed.

2/ Additional shade needed is the increase in percent-effective shade required to meet the target shade.

3/ If current shade is greater than or equal to the target shade, the time to recovery is listed as 0 years. If current shade is less than the target shade, the time to recovery is listed as the number of years needed to reach full system potential percent-effective shade. At a value equal to the target shade or ≥ 80 percent effective shade, a stream is considered recovered and the stream should not be a candidate for active restoration. Additional shade should come from passive management of the riparian area. Any increase over the target shade or 80 percent effective shade is considered a margin of safety. Years to recovery are a weighted average of recovery time for individual stream reaches.

Sediment—

Sediment is a natural part of a healthy stream system with equilibrium between sediment input, routing, and in-stream storage. Under natural conditions, there is generally a balance between the amount of fine sediment, coarse bed load sediment, and larger elements of instream structure (i.e. wood, boulders). Sedimentation results from either stream channel or upland erosion. Disturbances that change riparian vegetation, increase the rate or amount of overland flow, or destabilize a stream bank may increase the rates of stream bank erosion and result in sedimentation increases (ODEQ 2004). Disturbances in the uplands that remove vegetation reduce soil stability on slopes or channel runoff can increase sediment inputs (ODEQ 2004).

Natural erosion processes occurring in the allotment area such as landslides, surface erosion, and flood events contribute to increased sedimentation (USDI and USDA 1997). Sediment sources resulting from human activities include roads; logging (tractor skid trails, yarding corridors, and landings); off-highway vehicle (OHV) trails and concentrated livestock grazing in riparian zones. While there are a number of natural and anthropogenic sources of sediments, there are observations that directly correlate livestock grazing as the source of some of the sedimentation in the allotment (as noted for discussions in Standard 2 on streambank disturbance). For example, cattle induced post holing, hoof shear, bank destabilization, and head cutting have been observed in and adjacent to watercourses in actively grazed pastures in the headwaters of Soda and Conde Creeks, activities which resulted in obvious contributions of fine sediment directly to aquatic habitats.

The BLM allotment acres within the drainage area of sediment listed streams are summarized in Table 4.

Table 4. Allotment Acres draining to Sediment Listed Streams (BLM-Administered Lands)

Deer Creek and Tributaries	Lost Creek and Tributaries	Soda Creek and Tributaries	South Fork Little Butte Creek and Tributaries
18 ac.	1,055 ac.	1,928 ac.	5,347 ac.

Coliform—

Fecal coliform bacteria are produced in the guts of warm-blooded vertebrate animals, and indicate the presence of pathogens that cause illness in humans. E. coli is a species of fecal coliform bacteria. A variety of everyday activities cause bacterial contamination in surface waters (ODEQ 2004:9). The largest sources of contamination include runoff from agricultural, industrial, rural and urban residential activities (ODEQ 2004:9). Sources of bacteria from BLM-administered lands include animal feces (wild and domestic, including livestock such as cattle) and inadequate waste disposal by recreational users. The BLM does not monitor fecal coliform and it is often difficult, as it is with the other parameters, to attribute livestock impacts to the monitoring results.

Stream surveys in 1995 and 1998 identified negative water quality impacts within the allotment that were grazing related. However, none of the streams within the allotment are listed for coliform. In addition, management measures used to limit the presence of livestock in stream channels or riparian zones in order to reduce sedimentation (USDI 2006a) will also minimize the amount of bacterial contamination in surface water from BLM-managed lands.

Water diversions and impoundments—

There are two ways that water diversions increase stream temperature; 1) by reducing volume in the mainstem and 2) as warmed ditch water is returned to the main channel. This ditch water is also of lower water quality as it picks up excess nutrients and sediment. Small impoundments increase water temperatures by slowing water movement and increased cumulative insolation. Talent Irrigation District (TID) diverts water from Conde and Dead Indian Creeks into Howard Prairie Reservoir. The Conde Creek diversion, located upstream of Owens Prairie (T38S R3E Section 9) dewaters the stream channel during much of the irrigation season.

Conversion to stock ponds—

Stock pond conversions limit connectivity, increase water temperatures, provide suitable habitat for non-native species introductions, and reduce stream flow in downstream channels. There are approximately 8 stock ponds or watering developments in the Conde Creek Allotment.

Riparian plant community cover/structure, lotic—

Riparian plant community structure influences water quality by shading, thus maintaining lower water temperature. Lack of overhanging and streambank vegetation likely influences water quality by facilitating higher temperatures and suspended sediments.

Beneficial uses—

The allotment falls within the state delineated source water areas for the Medford Water Commission and the cities of Gold Hill, Rogue River, and Grants Pass. The surface water source for these four public water systems is the Rogue River. Little Butte Creek is a tributary to the Rogue River. The allotment is located over 27 miles upstream from the closest public water system intake, which would diminish any effects from the Conde allotment beyond recognition, as the water quantity in the Rogue River and the myriad other tributaries contributed to the Rogue below the Little Butte Confluence would render detection of Little Butte Creek (a small fraction of the total volume of flow) water impossible.

A source water assessment is in progress for the Medford Water Commission and assessments have been completed by the DEQ and the Oregon Department of Human Services for the cities of Gold Hill, Rogue River, and Grants Pass. The completed assessments include an inventory of potential contaminant sources within the source water areas. Grazing animals were identified as a potential contaminant source for the Gold Hill, Rogue River, and Grants Pass drinking water protection areas.

Cold-water aquatic life such as salmon and trout are the most sensitive beneficial uses in South Fork Little Butte Creek and its tributaries (ODEQ 2004:5).

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.

To meet this standard, native plant communities and animal habitats would be minimally affected by the use of their habitats by livestock. Applying the assessment of this standard in this manner assures that effects from other sources are not confounding the effects of livestock grazing.

Indicators Used to Evaluate this Standard

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 strategic 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. Therefore, this standard would require that no trend occur toward listing as a result of livestock grazing.

Table 3-13. Known or Suspected Special Status Species

Common Name	Scientific Name	Status
Northern Spotted Owl	*Strix occidentalis caurina*	FT - Suspected
Fisher	*Martes pennanti*	FC - Suspected
Mardon Skipper Butterfly	*Polites mardon*	FC - Known
Bald Eagle	*Haliaeetus leucocephalus*	BS - Known
Foothill Yellow-legged Frog	*Rana boylii*	BS - Suspected
Northwestern Pond Turtle	*Actinemys marmorata marmorata*	BS - Suspected
Pallid Bat	*Antrozous pallidus*	BS - Suspected
Fringed Myotis	*Myotis thysanodes*	BS - Suspected
Chase Sideband	*Monadenia chaceana*	BS - Suspected
Travelling Sideband	*Monadenia fidelis celeuthia*	BS - Suspected
Siskiyou Hesperian	*Vespericola sierranus*	BS - Suspected
Siskiyou Short-horned Grasshopper	*Chloealtis aspasma*	BS – Known
Oregon shoulderband Snail	*Helmithoglypta hertleini*	BS - Suspected
Western Bumblebee	*Bombus occidentalis*	BS – Suspected

FT = Federal threatened
FC = Federal Candidate
BS = Bureau Sensitive

Livestock grazing primarily impacts wildlife by changing vegetation composition, structure, and function. Livestock grazing may result in a reduction of forage available to native herbivores (e.g., deer and elk), as well as reductions in vegetative cover for ground nesting birds, burrowing rodents, and other wildlife species dependent on ground cover for protection, food, and breeding sites (e.g., Mardon skipper butterfly).

Grazing also may reduce water quality in seeps, springs, and streams used by native wildlife. The presence of livestock can change local distribution and habitat use by native species due to interspecific behavioral traits. Currently, grazing occurs in all vegetation communities and condition classes in the allotment, but is most prevalent in the grassland/meadow and open forest vegetation communities. Riparian areas are favored grazing sites in all vegetation communities in the allotment.

The following potential interactions between native, T&E, locally important species and livestock are indicators whether standard #5 is being met.

Species of Special Concern that are Minimally Affected by Grazing

Some of the species of special concern found in the allotment are not greatly affected by grazing. The suite of species that is not affected or affected to only a minor degree includes the following: northern spotted owl, bald eagle, fisher, olive-sided flycatcher, black-throated gray warbler, flammulated owl, northern goshawk, pallid bat and fringed myotis. These species are primarily associated with the Mixed-Conifer and White Fir Zone forest stands. Grazing does not physically reduce the numbers of these species nor does it appreciably reduce feeding, breeding and sheltering opportunities.

Northern Spotted Owl—

There are no known northern spotted owl nest sites in the allotment. Northern spotted owls prefer dense forest habitat and grazing is light to non-existent in these areas due to a lack of forage. Grazing does not affect this species in this allotment.

Bald Eagle—

Bald Eagle nests are known to be located near Howard Prairie Lake and may on occasion, occur within this allotment, but are unlikely to be impacted by grazing as neither their treetop nest sites nor the fish and waterfowl upon which they feed are subject to impacts from grazing.

Fisher—

Fishers are confirmed to occupy forested habitat near the Conde Creek Allotment. Fishers are unlikely to be impacted by grazing as they primarily utilize forested areas and depend upon large wood for denning sites, and small to medium sized mammals for prey. Denning sites and prey species are unlikely to be impacted by grazing.

Olive-sided Flycatcher and Black-throated Gray Warbler—

Flycatchers and warblers feed primarily on insects, and nests are generally located relatively high in conifers (Marshall et al., 2003) where they are not disturbed by cattle. There could be a minor impact to this species if an occasional nest is placed near the ground where nesting could be disrupted by cattle.

Flammulated Owl and Northern Goshawk—

These species are associated with mature forest stands. Grazing impact to these stands is minimal. Thus these species are not affected by grazing in this allotment.

Pacific Pallid Bat and Fringed Myotis—

These bats are associated with a variety of habitats including conifer forests and oak-woodlands. They forage primarily on flying insects, and roost in mines, caves, abandoned buildings, and crevices and cavities in large trees. Due to their foraging and roosting habits, impacts from grazing are undetectable.

Deer and Elk—

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 et al., 2007b). Grazing in this allotment reduces forage during spring, summer, and fall, and has

corresponding detrimental effects on big game species. However, the area encompassed by this allotment is not home to large concentrations of elk. Instead it is used in the same manner as the large surrounding landscape which consists of a similar mosaic of forests and meadow openings. Elk are likely to continue to used this allotment despite grazing by cattle. Under the management guidelines established for this grazing allotment the sorts of habitat degradation described above would be very limited and effects to these species are expected to be insignificant.

Small Mammals—

While richness and diversity of small mammals is not influenced by livestock grazing in riparian, woodland, and mixed conifer communities, small mammal biomass is less in grazed versus ungrazed areas (Johnston and Anthony In review a, b). However, a study of small mammals near this allotment (in the Cascade Siskiyou National Monument) indicates that several small mammals are reduced in number in areas of moderate to severe use. Total small mammal biomass is reduced in moderate to severe use areas by 138 g/ha (Johnston and Anthony. In review a, b). Biomass of small mammals was significantly lower on heavily versus lightly grazed sites.

Birds—

Ungulate use appears to lead to an increase in abundance of ground nesting birds, but may not favor overall reproductive success by these species. This may result from a decrease in the cover of shrubs which provides more nest sites for ground-nesting birds. Ungulate use has a negative influence on abundance of shrub-nesting birds including migratory neo-tropical birds (Alexander et al. 2008). It is not known if the increased abundance of shrubs found in formerly open, fire-mediated plant communities (Hosten et al. 2007c) compensates for livestock influence on shrub-nesting bird species.

Mardon Skipper Butterfly—

The Mardon skipper butterfly is a Bureau Sensitive Species and is listed as a Federal Candidate species under the U.S. Endangered Species Act. One reproductive site is known within the allotment. Twelve known sites occur in the Ashland Resource Area. The "primary threat" listed for each of these sites in the 2011 Conservation Assessment (version 1.1) is "grazing." Mechanisms through which livestock may impact this species include trampling, eating food sources, and facilitating invasion of non-native plants (Xerces, 2007, 2010). With the construction of a protective exclosure at the reproductive site, impacts to the Mardon Skipper in the Conde Creek Allotment are greatly reduced.

An existing exclosure (Project 75035, Aspen Enclosure) will protect areas known to be inhabited by the Mardon Skipper. This exclosure (extended since 2009) will aid this butterfly species through limiting trampling of eggs, larvae, or adults and through increased availability of preferred vegetation for oviposition and nectaring.

Survey and Manage and Bureau Special Status fungi, lichens, liverworts and bryophytes—

Currently, there are no known occurrences of Bureau Special Status lichens or bryophytes (nonvascular species) within the allotment area.

Two species of fungi (*Plectania milleri* and *Ramaria rubribrunnescens*) are present within the Conde Allotment area, and have the designated status of "Strategic", which requires no mitigation or management strategies.

Species of Special Concern that are Potentially Affected by Grazing

Species of special concern that are susceptible to the physical aspects of grazing, e.g., from trampling, rubbing, and water quality degradation, or affected by vegetation removal are:

Foothill Yellow-legged Frog and Northwestern Pond Turtle—

These species are dependent on riparian and aquatic habitat; therefore, they can be adversely affected when these habitats are degraded by grazing. Habitat degradation occurs through streambank trampling; wading in shallow ponds, springs, and streams; and defecation/urination in springs and seeps. Pond turtles also use upland habitat for nesting and nests can be trampled by cattle.

Travelling Sideband, Chase Sideband, and Siskiyou Hesperian—

These mollusks are commonly associated with rocky, moist, forested areas. Due to the concentrated grazing in riparian areas, habitat quality may be degraded. There also is potential for individuals of these species to be trampled. Impacts to these species would be limited by the tendency of cattle to avoid rocky, forested areas.

Rufous Hummingbird and Mourning Dove—

These species are common shrub nesters. Browsing and rubbing can disturb nesting activities, and in some cases nests can be destroyed. Doves also occasionally nest on the ground and these nests are susceptible to trampling. Doves are seedeaters and grazing reduces the seed available to this species.
Some graminoids because of drought, immaturity, or other stressors such as repeated heavy grazing do not set seed and others may be grazed after seed set. Hummingbirds depend on flowering plants for nectar, and grazing reduces the number of nectar-producing plants that reach the flowering stage. This occurs through both utilization and trampling.

Siskiyou Short-horned Grasshopper—

This species is known to occur at one location within the boundary of this allotment. It is often associated with blue elderberry for the egg-laying phase of its life cycle. Siskiyou short-horned grasshoppers are actively feeding and reproducing from July through September and are likely to be impacted by reduction of grass and forb resources upon which they depend for food and protective cover. Suitable habitat occurs at many locations within the Conde Creek Allotment. Cattle have been documented to impact elderberry through use as rubbing objects. The existing exclosure in section 7, associated with the Mardon Skipper butterfly, will also protect this species and its habitat.

Western Bumblebee—

This species is associated with open grass and forb dominated habitats. Western Bumblebees nest primarily in abandoned burrows constructed by gophers or other burrowing rodents. They feed on nectar and pollen from flowering plants. Their subterranean nests may be damaged by trampling and the flowering plants upon which they feed may be consumed or damaged.

Grasshopper Sparrow—

This species is likely to be directly affected by grazing. A ground nesting bird, the grasshopper sparrow depends on forbs, grasses and shrubs for protection. Its diet consists of insects and seeds, both of which

are impacted by consumption of the vegetation in the open grassland habitat that this bird requires. Several other 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 in this same manner.

Lentic Macro-invertebrate Community—

Disturbance-intolerant taxa decline with increased average livestock utilization across the Cascade Siskiyou National Monument located approximately 5 miles south of the Conde Creek Allotment. Parker (1999) found springs in East Fork Creek trampled by livestock with concomitant increases in fine sediment and loss of riparian vegetation. Loss of riparian vegetative cover results in increased sun exposure and decreased insect productivity.

Lotic Macro-invertebrate Community—

Barr et al. (2007) found that road density, livestock use, and logging likely acted interdependently to increase fine sediments in first and second order streams. Macro-invertebrate richness and diversity remained high for all four streams examined within the CSNM, and in comparison to other samples within the Utah State University National Aquatic Monitoring Center. In Conde Creek, upstream of the TID diversion, biotic/habitat integrity was limited by high levels of embeddedness and silt, low flows, lack of shade, and simplified habitat (Aquatic Biology Associates 2001). This same survey found very few positive indicators (feeding group diversity, cold water biota, cold water taxa richness, and habitat complexity) while the negative indicators (collector dominance and tolerant taxa) were moderate.

Aquatic macro-invertebrates—

A study examining patterns of aquatic macro-invertebrates in streamside riparian influence found that the combined influence of road density, logging, and livestock reduced aquatic macroinvertebrate richness (Barr et al. In review). Studies in seeps and springs found that high diversity and species indicative of clean water were compatible with low to moderate ungulate use (Dinger et al. 2007). Higher use resulted in a loss of intolerant species.

Aquatic mollusks—

There were no statistically significant associations of aquatic mollusk richness with livestock utilization (Barr and Frest In prep.); however, aquatic communities of larger and minimally altered springs are more diverse than are those of small and more disturbed springs. Sada & Vinyard (2002) established that 158 of 199 Great Basin endemic aquatic animal taxa are found only or primarily in mid- to low-level springs. These authors concluded that spring degradation and biotic population decline and loss were primarily due to anthropogenic factors, including livestock grazing in mollusk-occupied spring habitats.

Portions of the Conde Creek Allotment, specifically the headwaters of Lost Creek, are within a hotspot of *Flumicola* endemism. Little Butte pebblesnails (sp. 38) have been confirmed in three locations on the allotment and are suspected throughout the Lost Creek drainage. Areas rated non- quantitatively as severely grazed are more likely to lack springsnails entirely or to have low densities. While there may be localized “hot spots”, there are no large scale severe grazing sites on the Conde allotment.

Bureau Special Status Aquatic Species—

Southern Oregon/Northern California (SONC) coho salmon (*Oncorhynchus kisutch*), a “threatened species” under the Endangered Species Act (ESA) and Klamath Mountain Province (KMP) steelhead, a

"sensitive" species on the State Director's Special Status Species List (USDI 2008), are restricted to the lower 0.6 mile of Soda Creek (approximately 1.5 miles downstream of the allotment boundary) where a falls restricts upstream fish passage. A 12' waterfall restricts all upstream fish passage of the above noted species on Dead Indian Creek, approximately 5.0 miles downstream of the allotment boundary. Coho and steelhead use about ¼ mile of Deer Creek (approximately 3.0 miles downstream of the allotment boundary) for spawning, rearing and migration (ODFW 2002) before the gradient and narrow channel make the habitat unsuitable. In Lost Creek, steelhead have been confirmed to stream mile 3.7 but gradient restricts CCH to the lower 2.0 miles (approximately 4.0 miles downstream of the allotment boundary.

Populations of Little Butte pebblesnails (*Fluminicola* sp. 38) have been documented in this allotment, in the headwaters of Lost Creek. Very little information exists on the abundance or distribution of the Special Status species caddisflies.

Riparian grazing negatively effects aquatic species and their habitat by compromising the physical integrity of stream banks, increasing fine sediment, removing vegetation, and in some cases by trampling the organisms. Degraded streambanks and associated trampling increase compaction, width:depth ratios, and sedimentation all of which negatively influence habitat. Increases in fine sediment occur where cows have direct access to streams and this sediment is transmitted downstream during fall rains. Livestock use, especially in wet areas, change flow patterns in these naturally sensitive sites. Grazed riparian vegetation allows higher levels of solar radiation to reach water surface in seeps/springs/streams resulting in increased water temperatures. Late season grazing does not allow for plant regrowth before fall and winter rains when vegetation acts a sediment trap and bank stabilizer.

Federally Listed and Bureau Special Status Vascular Plants—

No occurrences of any federally listed plant species are known on federal lands within the allotment. The allotment is outside the range of federally listed plants known to occur on the Medford District of the BLM *(Fritillaria gentneri , Limnanthes floccosa, Arabis macdonaldiana,* and *Lomatium cookii)* as defined by the U.S. Fish and Wildlife Service (USDI Fish and Wildlife Service, 2003).

A total of 18 populations of special status vascular plants occur within the allotment (Table 5 and Map 3). Each of the 3 species that comprise the 18 populations is listed as "Sensitive" per the State Director's list that was finalized in February 2008.

TABLE 5: Special Status Species within the Conde Allotment

Scientific Name	2008 Status	Lifeform	Total # of Populations	# populations in 6-40% use	# populations in 41-80% use
Cimicifuga elata	SEN	Vascular plant	6	6	2*
Scirpus pendulus	SEN	Vascular plant	9	9	1*
Cypripedium montanum	SEN	Vascular plant	3	3	0
Plectania milleri	STR	Fungus	3	0	3
Ramaria rubribrunnescens	STR	Fungus	1	0	1

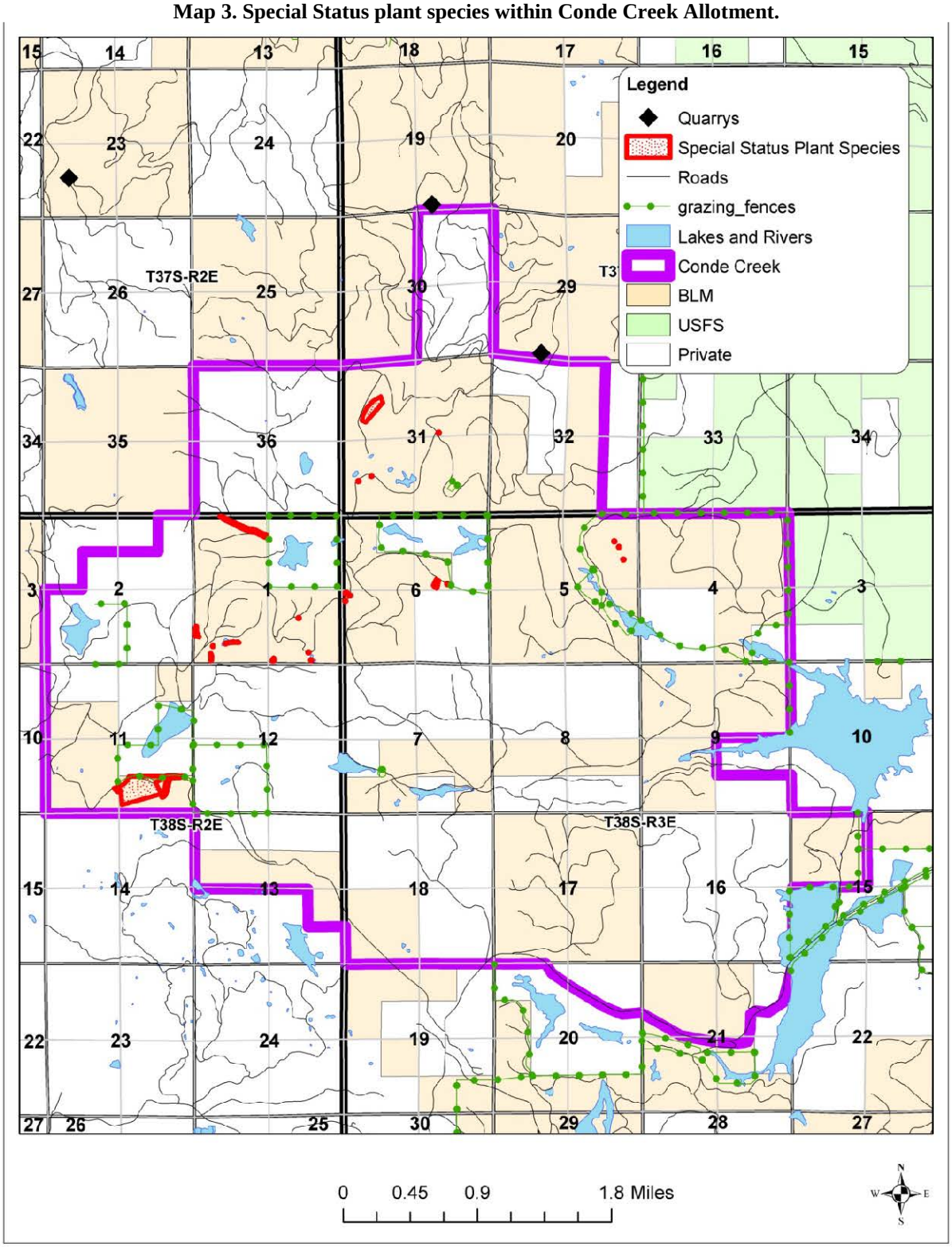
*Population straddles two different utilization value breaks
SEN-Sensitive
STR-Strategic

A study of cattle diets indicates that the bulk of their diet is comprised primarily of graminoids (80% of identified species) in areas managed for their use. 16% of that amount was comprised of unidentified grass species and grass-like species (e.g. unidentified sedges and rushes) (Holecheck et al. 1982). Of the special status species sites located within the Conde Creek Allotment, there is one species of graminoid, *Scirpus pendulus*, a member of the sedge family. A perennial graminoid, it grows in marshes, wet meadows and ditches, averaging a height of 50-100 cm (Mullens and Showalter 2007). *Scirpus pendulus* may be susceptible to grazing impacts due to its use as forage. The *Scirpus pendulus* populations in this allotment occur in areas receiving varying livestock utilization, averaging light use in most years, with a small portion of one population occurring in an area averaging moderate use. All populations occur in areas with perennially wet areas.

Cimicifuga elata is a perennial broadleaved forb that has reproductive limitations that make colonization into new sites difficult, including its lack of effective seed dispersal and attraction for pollinators when in competition with other flowering plants (due to lack of nectar). Other potential threats include competition with invasive species (Penny and Douglas 2001). Although not believed to be a preferred forage for cattle, the departure from ecological site descriptions due to the introduction and spread of invasive plants and the soil surface's reduced resistance to erosion could trend the populations of *Cimicifuga elata* within the Conde Creek Allotment towards a decline. Of the known populations within the allotment on BLM-administered lands, 6 populations are located near or adjacent to fenced (enclosed) areas of privately-owned lands known to be used for turnout or holding areas at various times during the grazing season.

Cypripedium montanum is a perennial forb and a member of the orchid family. Habitat includes moist areas, dry slopes and mixed-evergreen or coniferous forest (Hickman 1993). The 3 known populations within the Conde Creek Allotment area occur in a coniferous upland area, directly adjacent to a late-season meadow, in an area averaging light use. Early-season field visits in 2009 indicated that the 3 populations show no effects due to ungulate grazing.

Map 3. Special Status plant species within Conde Creek Allotment.



Noxious Weeds

"Noxious Weed" describes any plant classified by the Oregon State Weed Board that is injurious to public health, agriculture, recreation, wildlife, or any public or private property. The definition of a B-Designated weed is one "of economic importance which is regionally abundant, but which may have limited distribution in some counties" and treatment methods are determined on a case-by-case basis (Oregon Department of Agriculture Noxious Weed Program). Field surveys have located populations of four different species of noxious weeds within or adjacent to the allotment (Table 9). Canada thistle (*Circium arvense*), Klamath weed (*Hypericum perforatum*), medusahead rye (*Taeniatherum caput-medusae*) and Armenian (Himalayan) blackberry (*Rubus discolor*) are all "B-Designated Weeds", as determined by the Oregon Department of Agriculture.

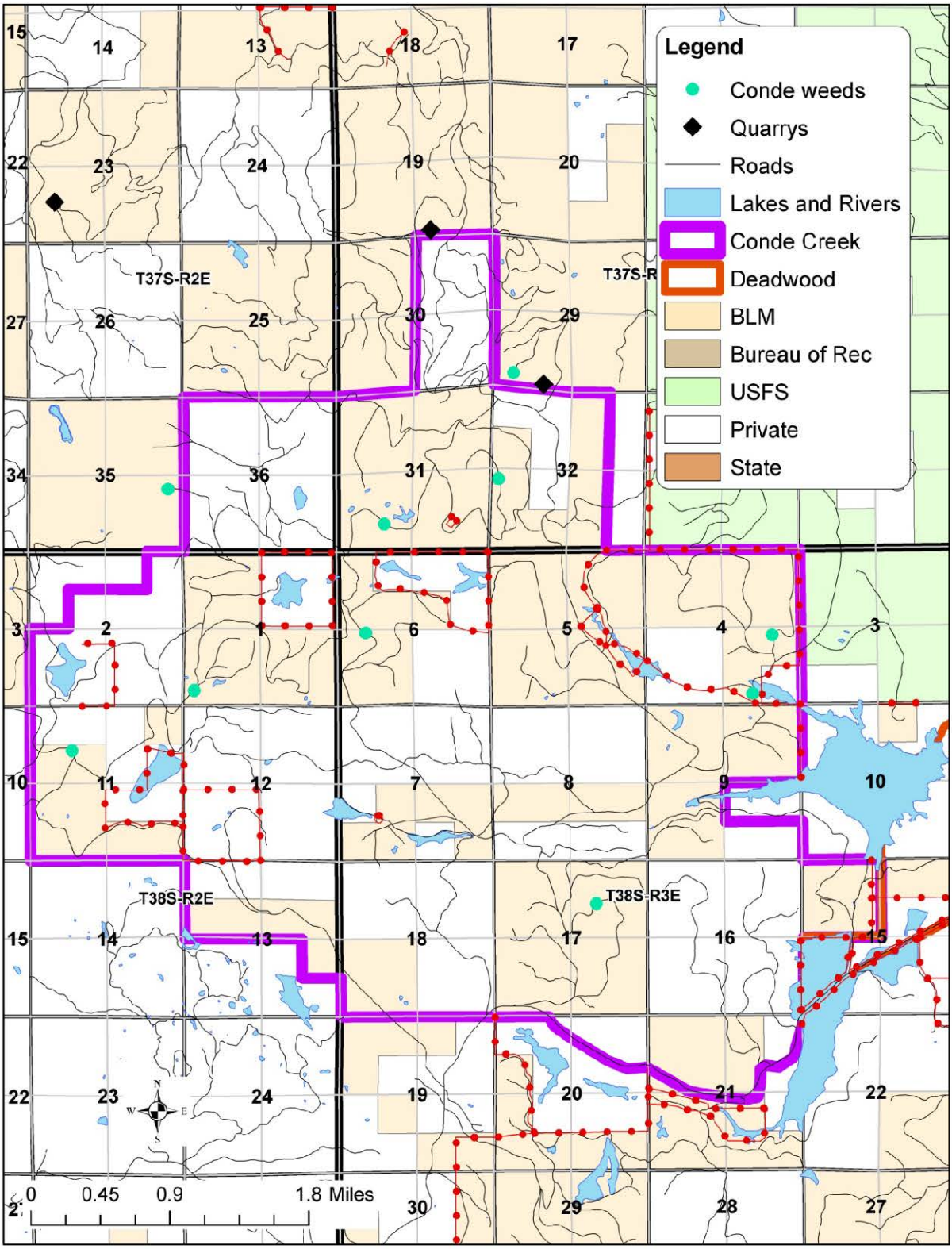
Most of the known populations of Armenian blackberry, Canada thistle and Klamath weed occur along existing roads or other areas that have a disturbance regime due to management activity (Map 4). Survey records indicate that the medusahead rye can be found primarily in meadows (dry, wet and semi-wet) and roadside. Due to the nature of population sizes of graminoid non-native species, it is unclear at this time the number and sizes of medusahead rye populations in this allotment.

The Rangeland Health Assessments conducted in August 2006 indicate that there is an extreme departure from the Ecological Site Description at the Dry Rocky Meadow site (USDI 2007b), due to the presence of introduced (non-native) grass species. The Wet Meadow, Pine/Fescue and Fir sites are all rated as Slight to Moderate departure from the Ecological Site Description. Disturbance from historic livestock grazing practices contributed to the invasion and conversion of native perennial grasslands throughout Southern Oregon and California in the past (D'Antonio and Vitousek, 1992). 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). Due to their invasive nature, noxious weeds present on the allotment can continue to spread when left untreated. Areas of moderate to heavy livestock utilization, congregation areas (salt blocks, water sources, shade) and loading areas that experience soil and vegetation disturbance within the allotment are at risk for noxious weed introduction and colonization.

Table 6. Known Noxious Weed Species Located in the Conde Creek Allotment.

Common Name	Scientific Name	Total # of Populations
Canada thistle	*Circium arvense*	9
Armenian (Himalayan) blackberry	*Rubus discolor*	2
Klamath weed (St. John's Wort)	*Hypericum perforatum*	1
Medusahead rye	*Taeniatherum caput-medusae*	unknown

Map 4. Distribution of Noxious Weed Populations within the Conde Creek Allotment Area.



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