

**Crowfoot, Bear Mountain, Vestal Butte, Moser Mountain and Neil
Tarbell Grazing Allotments –
STANDARDS OF RANGELAND HEALTH ANALYSIS**

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT
BUTTE FALLS RESOURCE AREA

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LOCATION:

The Crowfoot, Bear Mountain, and Neil Tarbell Grazing Allotments are located west of Crowfoot Creek Road and south of Highway 62. The Vestal Butte and Moser Mountain grazing allotments have Highway 62 bordering them from the west and north. The Crowfoot Allotment is located in T. 34 S., R. 1 W., Sections 1, 2, 10, 11, 12, 13, 14, 15, 23, and 24 and in T. 33 S., R. 1 E., Sections 5, 6, 7, 8, 9, 17, 18, and 19. To the northeast the Bear Mountain Allotment is located in T. 33 S., R. 1 E., Sections 31, 32, and 33 and in T. 34 S., R. 1 E., Sections 4, 5, 6, 9. The Neil Tarbell allotment is located in T. 34 S., R. 1 E., Sections 3, 10, 15, and 21. The Vestal Butte Allotment is located in T. 34 S., R. 1 E., Sections 23, 25, 26, 27, 34, and 35. The Moser Mountain Allotment is located in T. 35 S., R. 1 W., Section 15.

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INTRODUCTION

This is an Oregon/Washington Bureau of Land Management (BLM) Standards of Rangeland Health Evaluation that addresses the Crowfoot (#10038), Bear Mountain (#10037), Vestal Butte (#10035), Moser Mountain (#10041) and Neil Tarbell (#10008) Grazing Allotments. The Crowfoot allotment is 7,393 acres with 144 cows permitted from May 1-July 15 totaling 365 Animal Unit Months (AUMs). The Bear Mountain allotment is 1,008 acres with 54 cows permitted from April 16-May 31 totaling 81 Animal Unit Months (AUMs). The Vestal Butte allotment is 2,240 acres with 30 cows permitted from April 16-June 15 totaling 60 Animal Unit Months (AUMs). The Moser Mountain allotment is 40 acres with 3 cows permitted from April 1-April 30 totaling 3 Animal Unit Months (AUMs). The Neill Tarbell allotment is 552 acres with 37 cows permitted from April 16-May 30 totaling 55 Animal Unit Months (AUMs).

Vegetation

Vegetation in the allotments is a mosaic of plant communities, including conifer forest, mixed hardwood-conifer woodlands; Oregon white oak woodlands; wedgeleaf ceanothus and manzanita chaparral; grassy, rocky openings; and meadows. Elevation ranges from 1,700 to 3,100 feet. While plant composition in the mixed hardwood-conifer woodlands and Oregon white oak woodlands contain mostly native species, the open grassy and chaparral areas where soils are thinner, contain annual, non-native grasses like medusahead (*Taeniatherum caput-medusae*), hedgehog dogtail (*Cynosurus echinatus*), bulbous bluegrass (*Poa bulbosa*) and non-native annual bromes. The conversion from native to non-native species in these meadows occurred as a result of historical uses and the invasiveness and dominance of non-native grasses and forbs. The BLM is currently conducting fuels reduction treatments in some chaparral, oak woodland, and mixed hardwood conifer woodlands within the allotments. The treatments will return those plant communities to more open conditions which are closer to those under natural fire regimes.

Soils

The main soil limitations affecting livestock grazing are erosion, compaction, high water table, the depth to bedrock, and the steepness of slope. The health and the function of the watershed is not expected to be compromised by cattle if the amount of use is minimal and adequate vegetative cover and healthy root systems are maintained. If however, these factors are not maintained, it is expected that damage to the soils resource would result. These factors aid in maintaining existing infiltration, percolation, runoff and erosion rates. The soil type in a given area can provide information about vegetation, erodibility, annual production and other significant ecological information.

Areas dominated by invasive annual grasses have shallow root zones, and thus are less able than native grassland communities to retain and slowly release moisture, capture leaching nutrients, and stabilize the soil (D'Antonio and Vitousek 1992).

The soil series in these allotments are McMullin, McNull, Medco, Medford, Camas and Carney. The Medford, Camas and Carney soil series make up a very minor portion of the allotments. McMullin, McNull, Medco, Medford and Carney are all moderately susceptible for medusahead invasion due to clay content and climatic factors. (Web Soil Survey, 2009)

The McMullin soil series is a gravelly loam in meadows comprised of Idaho fescue, Lemmon needlegrass, associated shrubs, hardwoods, forbs, and scattered pine. Some areas are dominated by wedgeleaf ceanothus and Manzanita. It is a shallow soil (about 12-20 inches to fractured hard bedrock) this makes the soil moderately susceptible to site degradation. (USDA National Cooperative Soil Survey, 1993)

The McNull soil series is a loam. Native vegetation is ponderosa pine, Pacific madrone, Douglas-fir, whiteleaf Manzanita, California black oak, poison oak, and wild rose. Soil depth is approximately 32

inches. This soil is high in clay content resulting in slower permeability. Because of the slow permeability of the soil, it is highly susceptible to water erosion.

The Medco soil series is a cobbly clay loam. Native vegetation is Oregon white oak (in dry areas), ponderosa pine, Douglas-fir (in moist areas) shrubs, and grasses in dry areas. Soil depth is approximately 30 inches to bedrock. Medco soils have a high water table from December-March (6-8 inches) and very slow permeability causing it to be moderately susceptible for surface runoff resulting in erosion. (USDA National Cooperative Soil Survey, 1993)

If vegetative cover, root systems and current soil bulk density are kept intact during grazing, soil degradation is not expected to occur from grazing.

Hydrology

The Vestal Butte and Moser Mountain Grazing Allotments lie completely within the Shady Cove-Rogue River 5th field watershed. The Bear Mountain, Crowfoot, and Neil Tarbell allotments lie within both the Shady Cove-Rogue River 5th field watershed and within the Big Butte 5th field watershed. The allotments are within all three 6th field subwatersheds in the Shady Cove watershed and only within the Lower Big Butte Creek 6th field subwatershed of the Big Butte Creek watershed (see table 1). The majority of the streams are intermittent or ephemeral with very few perennial streams. Indian Creek flows westerly into the Rogue River separates the Crowfoot allotment to the north and the Vestal Butte allotment to the south. Crowfoot Creek flows out of the Crowfoot allotment and near the southern boundary of the Neil Tarbell allotment eventually draining into Big Butte Creek. Brush Creek drains the northern portion of the Crowfoot Allotment. There are approximately 8.5 miles of perennial streams, 103.7 miles of intermittent streams and 36.5 miles of dry draws within the allotment boundaries.

Table 1. Allotment Acres by 6th Field Subwatershed

| 5 th Field Watershed | Shady Cove-Rogue River | Shady Cove-Rogue River | Shady Cove-Rogue River | Big Butte | Total |
|------------------------------------|-------------------------|--------------------------|-------------------------|-----------------------|---------|
| 6 th Field Subwatershed | Brush Creek-Rogue River | Indian Creek-Rogue River | Reese Creek-Rogue River | Lower Big Butte Creek | |
| BEAR MOUNTAIN | 1267.2 | | | 61.9 | 1329.1 |
| CROWFOOT | 3303.6 | 5346.0 | | 715.0 | 9364.6 |
| MOSER MOUNTAIN | | | 40.5 | | 40.5 |
| NEIL TARBELL | | 19.6 | | 545.0 | 564.6 |
| VESTAL BUTTE | | 1928.6 | 323.6 | | 2252.2 |
| TOTAL | 4570.8 | 7294.2 | 364.1 | 1321.9 | 13550.9 |

ASSESSMENT

Rangeland Health Assessments are required on each allotment prior to consideration of grazing lease renewal. These assessments are conducted by an interdisciplinary team of resource specialists who assess ecological processes, watershed functioning condition, water quality conditions, special status species, and wildlife habitat conditions on an allotment. Assessments include field visits to the allotments and evaluation of all available data. All available data will be used to make an overall assessment of rangeland health as described in the *Standards for Rangeland Health and Guidelines and Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington* (Standards and Guidelines) (USDI 1997), in light of the Fundamentals of Rangeland Health at 43 CFR § 4180.1.

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

The Standards and Guidelines also specify a set of potential indicators for use when determining whether or not standards are being met. This assessment summarizes existing resource conditions on the Crowfoot Creek Allotment using information derived from the rangeland health field assessments; BLM monitoring data; and all other available data in relation to the five specific standards described in the Standards and Guidelines (USDI 1997).

Primary Supporting Data:

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

Rangeland Health Field Assessments: Field assessments using the protocol described in *Technical Reference 1734-6: Interpreting the Indicators of Rangeland Health* (USDI and USDA 2005) were conducted April 27th and May 12th 2011 at seven sites in five different ecological sites on the Crowfoot, Bear Mountain, Vestal Butte, Neil Tarbell and Moser Mountain Allotments. Ecological sites analyzed include; two Pine-Douglas fir- Fescue sites, a Loamy Shrub Scabland, three Loamy hills sites, and a Shallow Mountain Slopes ecological site. A summary of the field assessment findings can be found in Appendix B (RHA pp.23-32).

Range Trend Plots: Nested frequency transects are located at 5 locations within the allotments. Nested Frequency data is collected using methods described in *Technical Reference 1730-1, Measuring and Monitoring Plant Populations*. Data is collected periodically (every 5 years if possible) at established locations within allotments to determine the trend for that site and for similar plant communities within the allotments where applicable. A more complete summary of the Nested Frequency data can be found in Appendix C (RHA pp. 34-37).

Hydrologic/Riparian Surveys: Surveys were conducted in 1995, 1999, and 2007 using the Butte Falls 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.

Baseline Stream Temperature Monitoring: Seasonal 30-minute interval stream temperature data is collected at three long-term monitoring sites in the Lower Big Butte Level 6 subwatershed using USGS and Oregon DEQ-established methodologies. In particular, these sites are located on Big Butte and Clark Creeks – neither within this allotment. There are no long-term monitoring sites for stream temperature within the Shady Cove-Rogue River watershed on BLM-administered lands, in part due to the intermittent flow in most streams and limited access. Temperature monitoring data assists in assessment of Aquatic Conservation Strategy (ACS) Objectives 1-4 and 6-9 (USDA/USDI 1994b); for assessment of compliance with state water quality standards; and assists in development of State of Oregon/EPA-required Water Quality Management Plans for the area.

In December 2008, the Oregon DEQ issued the Rogue River Basin TMDL (Total Maximum Daily Load) as an executive order. The TMDL addresses temperature and bacteria (*E. coli*) impairments for an area that

includes the Project Area. TMDLs are numerical loadings that are set to limit pollutant levels such that instream water quality standards are met. The BLM is recognized by Oregon DEQ as a DMA (Designated Management Agency) for implementing the Clean Water Act on BLM-administered lands in Oregon. Each DMA has 18 months from the time the Rogue River basin TMDL becomes an executive order to develop or submit to Oregon DEQ an implementation plan. The BLM and Oregon DEQ have a Memorandum of Agreement that defines the process by which the BLM will cooperatively meet State and Federal water quality rules and regulations. In accordance with the Memorandum of Agreement, the BLM will develop or revise existing WQRPs (Water Quality Restoration Plan) as described in the Memorandum of Agreement; the WQRPs will be the TMDL implementation plans for the BLM (ODEQ and USDI 2003). The BLM prepared a WQRP for BLM-administered lands in the Big Butte Creek and Shady Cove watersheds (U.S. Department of Interior (USDI), Bureau of Land Management, 2008) (U.S. Department of Interior (USDI), Bureau of Land Management, 2011) in 2008 and 2011 respectively and both were approved by the Oregon DEQ. Recovery goals focus on protecting areas where water quality standards are being met and avoiding future impairments of these areas, and restoring areas not currently meeting water quality standards.

Gaging Station and Staff Gages: Flow and Water Quality Assessment: Calculation and assessment of peak, high and low flows are extremely difficult without actual field measurement and reference over time. Flow data is also required for the meaningful analysis of water quality parameters. Because of rapid fluctuation in stream levels, continuous records are required at a key location to interpret data collected in non-continuous sampling from other locations. Grab samples of turbidity, air temperature, water temperature, pH, and flow, are collected in four locations in the Lower Big Butte Level 6 subwatershed; the sites are located on Big Butte, Clark and Crowfoot Creeks. There are no monitoring sites located within the grazing allotments. Streamflow has not been measured at any sites within the allotments due to the seasonal nature streams in this area. There are no BLM stream gages established at any site within the Shady Cove 5th field watershed or the Lower Big Butte Creek Level 6 subwatershed. There are three USGS stream gages near the allotments, one in the Lower Big Butte Creek 6th field subwatershed (USGS 14337500), and two in the Shady Cove 5th field watershed (USGS 14337600 and USGS 14339000).

Stream Channel Cross Sections: Stream cross-section measurements are collected at one site within the Lower Big Butte Level 6 subwatershed; the site is not within the allotments and is located on Crowfoot Creek. Measurement methodologies include standard cadastral survey techniques and those outlined in Rosgen (1996). Sites are measured annually and/or 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.

Rain Gages: Assessment of hydrologic response and water quality parameters, as well as many other aspects of ecosystem function, can only be analyzed accurately in the context of recent precipitation. Rainfall data is not collected within the allotment area. Similarly, daily snowfall and snow-on-the-ground is not collected. Data from non-BLM sources however, indicates that average annual precipitation is between 30 and 35 inches. Year-to-year trends in precipitation tend to be uniform over an area the size of the allotment area, but there is substantial variability in precipitation across the Shady Cove 5th field watershed and the Lower Big Butte Creek 6th field subwatershed based on terrain, elevation, aspect, etc. Precipitation data from a number of sites at varying elevations and locations in and around the subwatershed is needed for accurate interpretation of related data including hydrologic and vegetation conditions. The nearest BLM-monitored rain gage is in the community of Butte Falls, Oregon – approximately six miles southeast and in the Lower South Fork Big Butte Creek Level 6 subwatershed.

Botany Surveys: Botany surveys have been conducted in the Crowfoot, Bear Mountain, Vestal Butte,

Moser Mountain and Neil Tarbell Grazing Allotments using the Intuitive Controlled Survey. In this method the surveyor traverses the project area enough to see a representative cross section of all the major habitats and topographic features, looking for Special Status plant species while en route between different areas. When the surveyor arrives at an area of high potential habitat, a more intensive search for the target species is made.

Wildlife Surveys: Surveys have been conducted in various parts of the allotments for northern spotted owls, terrestrial mollusks, great gray owls, and goshawks, using the appropriate survey protocols.

Standard 1 Watershed Function - Uplands

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

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

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

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

Rangeland Health Field Assessments were conducted in the allotments in the spring of 2011 at 7 locations. A complete summary of the results of the Rangeland Health Field Assessment can be found at the end of this document in Appendix C. The indicators pertaining to Soil/Site Stability revealed that at each of the 7 sites assessed that all ten indicators were rated a none-to-slight departure from the ecological sites reference condition.

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 include standing water systems such as lakes, ponds, seeps, bogs, and meadows; and 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.

Functioning Condition Assessments were conducted on a small portion (~7.6 %) of riparian areas on BLM-administered lands of the allotments in 1995, 1999 and 2007 (BLM Stream Surveys). These assessments refer to a consistent approach for considering hydrology, vegetation, and erosion/deposition (soils) attributes and processes to assess the condition of riparian areas. The majority of the surveys were completed on the Crowfoot side of the allotments, in part due to access in the area. Crowfoot Creek runs through the allotment area and is fed by numerous intermittent tributaries. Crowfoot Creek is a tributary of Big Butte Creek.

Crowfoot Creek and several of its tributaries lack structure and large woody debris recruitment. On several of the intermittent tributaries of Crowfoot Creek, downcutting and sidewall erosion has been observed. Many streams lack structure, but do not appear to be unstable. The general stability of this drainage network can be attributed to bedrock control of many of the streams. Nonetheless, some horizontal instability has been documented as seen in channel definition and migration. Approximately 55% of the surveyed streams in the allotment area are in Proper Functional Condition. Forty percent of the surveyed streams are Functional At Risk; of these approximately 17% are Functional At Risk with a Downward trend, but 8% of these can be attributed to natural surface roads and road crossings. Grazing impacts were identified in 7% of the reaches surveyed as contributing to the downward trend. Approximately 4% of the surveyed reaches were rated non-functional and identified grazing as contributing to this rating.

Field visits to all allotments during 2011 indicated wetland and riparian areas were in properly functioning physical condition appropriate to soil, climate, and landform. There was very little cattle pressure in any of the allotments and no “hot spots” were identified. The small amount of perennial streams and riparian areas in the allotments, early season of use, topography, vegetation, and fencing limit where cattle congregate and therefore limit impacts from cattle on riparian/wetland areas.

The road density is 4.8 ^{mi.}/_{mi.}² in the Lower Big Butte Creek Subwatershed and is 4.7 ^{mi.}/_{mi.}² in the Shady Cove-Rogue River Watershed. Roads within riparian areas can greatly influence aquatic and riparian conditions. Roads contribute to the disruption of aquatic connectivity, large wood and nutrient storage regimes, peak flow routing, aquatic habitat complexity, temperature regimes, channel morphology, and direct sediment inputs from road failures. The Matrix of Pathways and Indicators for the Klamath Province/Siskiyou Mountains considers road densities of less than 2.0 ^{mi.}/_{mi.}² as properly functioning condition and greater than 3.0 ^{mi.}/_{mi.}² as not properly functioning (ODFW 2002, 2003).

Table 2. Road Density by 6th Field Subwatershed

| Subwatershed/Watershed | Miles of Road | Road Density (Mi/Sq Mi) |
|--------------------------------|---------------|-------------------------|
| Lower BB (Big Butte) | 113.3 | 4.8 |
| Reese Ck - Rogue River (SCRR) | 286.9 | 4.9 |
| Indian Ck - Rogue River (SCRR) | 195.2 | 5 |
| Brush Ck - Rogue River (SCRR) | 59 | 3.3 |
| SCRR 5th field total | 541.1 | 4.7 |

(SCRR) = Shady Cove-Rogue River 5th field watershed

Standard 3 Ecological Processes

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

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

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

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

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

There is a healthy mix of live and dead/decaying matter on the rangeland. The dry meadows and oak woodland plant communities support a diverse mix of plant species. However, invasive plant species are scattered in patches through out the majority of the non-conifer areas, particularly annual grasses. 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. Medusahead where it is well established interrupts the nutrient cycle as it forms litter mats on the soil surface which decay slowly due to high silica content and retain nutrients. It also grows early in the season thus outcompeting perennial grass seedlings for early soil moisture and nutrients. In areas where these annual grass species are already well established the plant community has likely crossed over a threshold into a less desirable stable state. Introduction and establishment of exotic annual grasses occurred in past decades, and current livestock grazing is not intense enough to contribute to additional conversion of native plant communities to exotic annual grasslands.

Standard 4 Water Quality

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

The quality of the water yielded by a watershed is determined by the physical and chemical properties of

the geology and soils unique to the watershed, the prevailing climate and weather patterns, current resource conditions, the uses to which the land is put and the quality of the management of those uses. Standards 1, 2 and 3 contribute to attaining this standard.

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

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). Within the Crowfoot, Bear Mountain, Vestal Butte, Moser Mountain and Neil Tarbell Grazing Allotments, there is one listed stream on DEQs 2004/2006 303 (d) list. Indian Creek, which is bordered by both the Crowfoot and Vestal Butte allotments, is on the 303(d) list for Dissolved Oxygen (DO). Big Butte Creek (approximately one-third mile downstream from the Neil Tarbell allotment), is listed for summer stream temperature, *E. coli* and dissolved oxygen from its mouth to stream mile 11.6. Fencing prevents cattle in both the Crowfoot and Vestal Butte allotments from congregating along Indian Creek. There were no “hot spots” identified where cattle are impacting the riparian zone and therefore these allotments are not contributing to the water quality listing on Indian Creek. There was very little use observed in the Neil Tarbell allotment during our field visit on 4/27/11. There are very few seasonal streams and no perennial streams in this allotment. There were no areas identified that had ground disturbance from cattle and the potential to affect water quality is low both locally and at the watershed scale and would not contribute to the water quality listing on Big Butte Creek.

Roads may alter the groundwater and surface flow patterns locally and may create an imbalance in hydrologic systems. Natural and graveled road surfaces, road cuts, fill slopes, and ditch lines are subject to erosion. Ditch lines that are not effectively drained by relief culverts (cross drains) act as extensions of stream networks that deliver fine sediment, as well as intercepted ground and surface water directly into stream channels. Research (Jones and Grant 1994; Wemple 1994; Wemple, et al. 1996) suggests that roads that contribute to the extension of the stream channel network are related to changes in the timing and magnitude of peak flows. Road cuts intercept subsurface flow, effectively increasing the amount of surface flow, and the ditch lines allow the water to move through the stream systems quicker. The road density in the Lower Big Butte Creek Subwatershed is 4.8 $\text{mi.}/\text{mi.}^2$ and is 4.7 $\text{mi.}/\text{mi.}^2$ in the Shady Cove-Rogue River Watershed.

The 34S-1E-3.1 road is a gated natural surface road with poor drainage. The poor drainage of this road has resulted in rutting and standing water ponding on the road causing vehicles to drive around increasing the road width. There are long stretches of road (greater than 1000 feet) of water running down the surface of the road with active erosion causing rutting and stream sedimentation affecting local water quality. The road is mainly used for private or administrative access with little public use due to the gate limiting access (see pictures RHA p. 33).

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

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

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

Species are recognized as "special status" if they are federally or state listed as threatened or endangered, are proposed or a candidate for listing as threatened or endangered, or are Bureau sensitive. BLM policy is to manage for the conservation and recovery of listed and proposed species and their habitats; ensure that all actions authorized, funded, or carried out by the BLM are in compliance with the Endangered Species Act; evaluate all proposed actions to determine if individuals or populations of listed species or their habitat, including designated habitat, may be affected; and ensure that decisions, standards and guidelines, and best management practices are consistent with meeting recovery plan objectives and terms and conditions of applicable biological opinions. BLM policy for candidate, state listed and sensitive species is to ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for these species to become listed.

Bureau Special Status terrestrial wildlife:

Special Status species known or suspected to be present on the allotments are displayed in Table 3.

Table 3. Special Status Species (Terrestrial Wildlife)

| Species | Species Status |
|---|-------------------|
| American Peregrine Falcon (<i>Falco peregrinus anatum</i>) | BS |
| Bald Eagle (<i>Haliaeetus leucocephalus</i>) | BS |
| Chace Sideband Snail (<i>Monadenia chaceana</i>) | BS in Oregon, S&M |
| Foothill Yellow-legged Frog (<i>Rana boylii</i>) | BS in Oregon |
| Fringed Myotis Bat (<i>Myotis thysanodes</i>) | BS in Oregon |
| Grasshopper Sparrow (<i>Ammodramus savannarum</i>) | BS in Oregon |
| Horned Lark (<i>Eremophila alpestris strigata</i>) | BS |
| Johnson's Hairstreak Butterfly (<i>Callophrys johnsoni</i>) | BS |
| Lewis' Woodpecker (<i>Melanerpes lewis</i>) | BS in Oregon |
| Northern Spotted Owl (<i>Strix occidentalis caurina</i>) | T&E |
| Northwestern Pond Turtle (<i>Actinemys marmorata marmorata</i>) | BS |
| Oregon Shoulderband Snail (<i>Helminthoglypta hertleini</i>) | BS in Oregon |
| Townsend's Big-eared Bat (<i>Corynorhinus townsendii</i>) | BS |

| | |
|--|--------------|
| Travelling Sideband Snail (<i>Monadenia fidelis celeuthia</i>) | BS in Oregon |
| Siskiyou Hesperian Snail (<i>Vespericola sierranus</i>) | BS in Oregon |

BS – Bureau Sensitive Species
T&E – Threatened or Endangered
S&M – Survey and Manage

BLM recently issued interim guidance for meeting BLM’s responsibilities under the Migratory Bird Treaty Act and Executive Order (EO) 13186. Both the Act and the EO promote the conservation of migratory bird populations. The interim guidance was transmitted through Instruction Memorandum (IM) No. 2008-050. The IM relies on two lists prepared by the U.S. Fish and Wildlife Service in determining which species are to receive special attention in land management activities; the lists are *Bird Species of Conservation Concern* (BCC) found in various Bird Conservation Regions and *Game Birds Below Desired Condition* (GBBDC). Table 4 displays those species that are known or suspected to be present on the allotments.

Table 4. Bird Species of Conservation Concern

| Species | Species Status |
|--|----------------|
| American Peregrine Falcon (<i>Falco peregrinus anatum</i>) | BCC |
| Bald Eagle (<i>Haliaeetus leucocephalus</i>) | BCC |
| Band-tailed Pigeon (<i>Columba fasciata</i>) | GBBDC |
| Horned Lark (<i>Eremophila alpestris strigata</i>) | BCC |
| Mourning Dove (<i>Zenaida macroura</i>) | GBBDC |
| Olive-sided Flycatcher (<i>Contopus cooperi</i>) | BCC |
| Oregon Vesper Sparrow (<i>Poocetes gramineus affinis</i>) | BCC |
| Purple Finch (<i>Carpodacus purpureus</i>) | BCC |
| Rufous Hummingbird (<i>Carpodacus purpureus</i>) | BCC |
| Willow Flycatcher (<i>Empidonax traillii</i>) | BCC |

BCC - Bird of Conservation Concern
GBBDC - Game Birds Below Desired Condition

Table 3 lists the Bureau Sensitive terrestrial wildlife species and Table 4 lists additional bird species of concern that have a possibility of being found in the allotments based on the type of habitat within the allotments. Livestock grazing primarily affects wildlife by changing vegetation composition, structure, and function. Grazing can result in a reduction of forage available to native herbivores (e.g. deer and elk), as well as reductions in vegetative ground cover for ground-nesting birds, rodents, and other wildlife species dependent on ground cover for protection, food, and breeding sites. Grazing also reduces water quality in seeps, springs, and streams used by native wildlife. The presence of livestock can also change local distribution and habitat use by native species due to interspecific behavioral traits. Generally, the extent of impacts to individual T&E species and their habitats are unknown.

Bats

Townsend’s big-eared bats hibernate and give birth to their young in caves or mines and feed mainly on moths. There are no caves or mines in these allotments and it is not expected that grazing will disrupt any of their colonies. Fringed myotis bats appear adapted to live in areas with diverse vegetative substrates. They are associated with a variety of habitats including conifer forests and oak woodlands. They roost in buildings, caves, mines, and crevices and cavities in large trees. The ability for these bats to forage or find shelter for roosting or birthing will not be impacted by grazing on these allotments.

Birds

Bald eagles have been observed nesting near the Rogue River in the Crowfoot Allotment. Bald eagles were removed from the threatened and endangered species list on July 9, 2007 (172 FR 130). They remain on the BLM special status species list. Bald eagles build their nests in large, dominant overstory trees, often at

the edge of a stand or on a ridge. In southern Oregon, the majority of bald eagle nests are found in large trees near lakes, rivers, and large ponds. They primarily forage on fish from rivers and large bodies of water. Grazing here would have no impact on their ability to forage or nest.

Band-tailed pigeons may be present in the allotments. They primarily nest in Douglas-fir trees within closed-canopy mixed conifer stands, a condition present in a portion of the Crowfoot, Bear Mountain, Vestal Butte and Neil Tarbell allotments. The short duration and relatively small number of cows authorized in the allotments will not negatively impact the band-tailed pigeon, because grazing does not remove mature Douglas-fir trees.

Streaked horned larks are not likely to be disturbed by grazing in these allotments because they are not known to nest in southwestern Oregon. Horned larks migrate through the Rogue Valley in the spring and fall and have been sighted near Lost Creek Lake during these times (Barrett, personal communication). Horned larks are commonly found in open fields with short (<1 ft), herb-dominated ground cover, and areas of significant sparse vegetation and patches of bare ground (Marshall 2003). Sightings of horned larks on Table Rock were reported in 2007 (Schnoes personal communication). It is unknown if this is the sub-species *strigata*.

Lewis's woodpeckers are associated with open woodlands near streams and rivers. They breed sparingly along Bear Creek and areas of the Upper Rogue Valley in Jackson County. The area wildlife biologist has observed Lewis' woodpeckers in the upper Rogue Valley during the winter, but has not observed them in the area during the breeding season. Habitat preference is hardwood oak stands with scattered ponderosa pine near grassland shrub communities. Threats not related to grazing include the decline of lowland oak habitat, competition with European starlings, prospects for nest and food storage trees, competition for nest holes, and effects of pesticides. Because grazing does not remove nest and forage trees from the Lewis' woodpecker, there will be no negative impact to the bird within these allotments.

Olive-sided flycatchers are often encountered on the BFRA (Butte Falls Resource Area) and occur in coniferous forests where they use tall trees and snags for nesting and foraging. Cattle grazing will not remove habitat for the olive-sided flycatcher which forages on insects and nests in trees.

Species that would be affected by forage removal include rufous hummingbirds, mourning doves, Oregon vesper sparrows, and grasshopper sparrows. While the mourning dove would be affected by the removal of seed-producing plants such as grasses, it will also forage on seeds of many other herbaceous plants and trees. Mourning doves are well-distributed throughout the resource area and grazing here will not negatively disrupt their ability to survive. In the Rogue Valley, one small colony of grasshopper sparrows has been located outside of land administered by the BLM. They prefer to nest and forage in open grasslands, generally free of woody shrubs. These allotments are not ideal habitat for the grasshopper sparrow. Oregon vesper sparrows favor dry, grassy foothills around the Rogue Valley for nesting. Habitat requirements include elevated perches for singing and an understory dominated by grasses for foraging and nesting, with small patches of woody plants and bare ground. Like the grasshopper sparrow, the vesper sparrow nests on the ground in dry grasslands in the foothills of the Rogue Valley. Heavy grazing poses a disturbance (from trampling of nests and removal of cover) to these two sparrow species, but it is expected that with the short duration of use within the allotments that there will be no to very few areas of heavy use. The rufous hummingbird may use these allotments for foraging and nesting, preferring the wooded areas with a well-developed understory and high canopy cover for nesting. While it feeds on nectar from flowering plants, it will also forage on insects and take advantage of hummingbird feeders near houses. Because of the short duration of grazing here and because nesting habitat will not be removed, it is not expected that grazing will have a negative impact on the persistence of the species.

Northern spotted owls have been observed within these allotments. Spotted owls nest in coniferous forests with a well-developed overstory and the presence of large stick nests, cavities, or mistletoe, and forage on forest-dependent mammals such as flying squirrels and wood rats. Grazing here will neither have any impact on the spotted owl's ability to forage, nor will it remove any mature trees it requires for nesting.

Peregrine falcons are present near the allotments, although no nests have been confirmed within the allotments. Nesting habitat for peregrines in this area is on ledges on rocky cliffs. They forage for birds in flight above the ground. Grazing would have no impact on peregrine nesting or foraging in the area since peregrines are not dependent on the vegetation consumed by cattle and because livestock do not graze on ledges or rocky cliffs.

Purple finches breed in a variety of habitats, including mixed conifer-hardwood forests, deciduous woodlands, edge habitat, riparian corridors, and vigorously regenerating clearcuts. Nests are on limbs of trees. Post-breeding, purple finches can also be found in meadows, brush fields, and riparian vegetation, while choosing a wide variety of habitats during the winter, from woodlands to residential areas. Diet primarily consists of vegetative items such as berries, buds, and seeds. The persistence of the species is not anticipated to be negatively impacted since grazing will not remove the trees it nests in or remove much of the food (berries, buds, and seeds) this species requires.

Willow flycatchers may also be present within the allotments. They are closely associated with shrub-dominated habitats that contain dense shrubs or tall herbaceous plants with patches of shorter vegetation. They prefer riparian areas and willow thickets in southwest Oregon. They nest in shrub-level vegetation within a few feet of the ground. Because of the short duration of grazing here, the relatively small number of cattle using the allotments, and nesting habitat will not be removed, it is not expected that grazing will have a negative impact on the persistence of the species.

Butterflies

The Johnson's hairstreak butterfly has been observed approximately 15 miles southeast of the allotments, where surveys for them were conducted on the BFRA. They are closely associated with older, late-successional coniferous forests that contain dwarf mistletoe as a host for their larvae. The nectar plants that they forage on have whitish flowers and include vine maple, dogbane, manzanita, Oregon grape, pussy paws, Whitehorn ceanothus, Mahala mat, mountain balm, bunchberry, Pacific dogwood, wild strawberry, yellow cress, and dewberry. Because cattle do not forage on the hosts for their larvae and nectaring plants are widely available and distributed through the area, there is no anticipated impact on the persistence of the Johnson's hairstreak in the allotments.

Mollusks

Mollusk surveys have been performed in the Crowfoot and Neil Tarbell Allotments, but none of the species listed in Table 1 were noted within this area. The terrestrial mollusk species in Table 1 seek refuge in moist areas under rocks and large woody debris during the summer and late winter seasons, and are generally associated with mixed conifer forests with a high percentage of canopy cover. Oregon shoulderband, Chace sideband, and Siskiyou hesperian snails have been found to be well-distributed across the BFRA, while the travelling sideband has been observed in four different locations outside the allotments, based on protocol mollusk surveys. No impact to the large woody debris or talus areas is expected from grazing and it is not anticipated that grazing in this area will impact the persistence of these species.

Reptiles and Amphibians

The foothill yellow-legged frog depends on aquatic environments for their entire life cycles. Foothill yellow-legged frogs are associated with low gradient streams. This species is impacted by issues of water quality and habitat degradation (trampling, wading, and consumption of vegetation) which may be caused by livestock.

The northwestern pond turtle may occur within the allotments. Northwestern pond turtles spend the majority of their life cycle in aquatic environs, but must leave the water to dig terrestrial nests and lay their eggs. These turtles often overwinter in upland settings as well. Both of these activities would be impacted by heavy grazing and post-holing by livestock. We have not observed evidence of heavy grazing or post-holing by cows in the allotments, and do not expect that grazing authorized at the current level poses a threat to the persistence of the pond turtle or the yellow-legged frog in these allotments.

Special Status Species (Aquatic):

Indian Creek is accessible by Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), a “threatened” species listed in the Endangered Species Act (ESA). Vestal Butte and Crowfoot allotments are fenced along the border of Indian Creek. Cutthroat trout inhabit some streams in all allotments except Moser Mountain.

Table 5. Special Status Species (Aquatic)

| Species | Status | Allotment |
|--|--------|---|
| SONC coho salmon (<i>Oncorhynchus kisutch</i>) | FT | Vestal Butte, Crowfoot |
| Cutthroat trout | BS | Vestal Butte, Crowfoot, Neil Tarbell, Bear Mountain |

FT- Federally Threatened

BS- Bureau Sensitive

Federally Listed and Bureau Special Status Vascular Plants:

The Crowfoot, Bear Mountain, Vestal Butte, Moser Mountain and Neil Tarbell Grazing Allotments are within the range of federally endangered *Fritillaria gentneri* (Gentner’s fritillary). The Moser Mountain, Vestal Butte, and western portion of the Crowfoot Allotment are also within the range of federally endangered *Limnanthes floccosa*. The allotments are outside the range of federally listed plants *Arabis macdonaldiana*, and *Lomatium cookii* as defined by the U.S. Fish and Wildlife Service (USDI Fish and Wildlife Service, 2003).

Surveys for Special Status vascular plants and 2nd year surveys for *Fritillaria gentneri* were conducted in the allotments. Twelve Bureau Sensitive vascular plant species were found within the allotments.

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

Surveys for Special Status nonvascular plants have been conducted in allotments for fuels reduction and other land management projects. Currently, there are five known occurrences of Bureau Special Status lichens or bryophytes (nonvascular species) and five species of fungi within the allotments.

Table 6. Special Status Species (Vascular and Nonvascular Plants)

| Scientific Name | Common Name | Lifeform | Allotment Name | Occurrences | Status |
|----------------------------------|---------------------------|----------------|-----------------------------------|-------------|-------------|
| <i>Ranunculus austrooreganus</i> | Southern Oregon buttercup | Vascular Plant | Moser Mountain | 1 | BS |
| <i>Plagiobothrys greenii</i> | Greene’s popcornflower | Vascular Plant | Moser Mountain | 1 | BS |
| <i>Plagiobothrys austiniiae</i> | Austin’s popcornflower | Vascular Plant | Moser Mountain | 1 | BS |
| <i>Meconella oregano</i> | White fairypoppy | Vascular Plant | Moser Mountain | 1 | BS |
| <i>Fritillaria gentneri</i> | Gentner’s fritillary | Vascular Plant | Vestal Butte | 6, 1 | FE |
| <i>Cypripedium fasciculatum</i> | Clustered lady’s slipper | Vascular Plant | Vestal Butte, Crowfoot, Bear Mtn. | 2, 5, 1 | BS, S&M (C) |
| <i>Carex serratodens</i> | Sawtooth sedge | Vascular Plant | Vestal Butte | 2 | BS |
| <i>Chlorogalum angustifolium</i> | narrowleaf soap plant | Vascular Plant | Crowfoot | 4 | BS |
| <i>Arabis modesta</i> | Rogue Canyon rockcress | Vascular Plant | Crowfoot | 1 | BS |
| <i>Cypripedium montanum</i> | mountain lady’s slipper | Vascular Plant | Crowfoot, Bear Mtn., Vestal Butte | 4,1,1 | S&M (C) |
| <i>Cheilanthes intertexta</i> | coastal lipfern | Vascular Plant | Crowfoot | 1 | BS |

| | | | | | |
|--|----------------------------|----------------|------------------------|------|-------------|
| <i>Limnanthes floccosa</i> ssp. <i>bellingiana</i> | Bellinger's meadowfoam | Vascular Plant | Crowfoot | 2 | BS |
| <i>Porella bolanderi</i> | | Liverwort | Crowfoot | 1 | BS |
| <i>Clavariadelphus sachalinensis</i> | Strap-shaped pestle fungus | Fungi | Crowfoot, Neil Tarbell | 5, 2 | S&M (B) |
| <i>Sowerbyella rhenana</i> | Stalked orange peel fungus | Fungi | Crowfoot, Neil Tarbell | 1, 1 | BS, S&M (B) |
| <i>Ramaria rubripermanens</i> | Pink-tipped coral fungus | Fungi | Neil Tarbell | 1 | S&M (D) |
| <i>Tremiscus helvelloides</i> | Apricot jelly fungus | Fungi | Neil Tarbell | 1 | S&M (D) |

FE- Federally Endangered

BS- Bureau Sensitive

S&M- Survey and Manage

Category A & C; Manage all known sites, Complete pre-disturbance surveys

Category B; Manage all known sites, No pre-disturbance surveys required

Category D; Manage "high-priority" sites, Pre-disturbance surveys not practical OR not required to provide a reasonable assurance of species persistence

There are 12 species and 37 populations of vascular Special Status and Survey and Manage species within the Crowfoot, Bear Mountain, Vestal Butte, Neil Tarbell, and Moser Mountain allotments. One of the species, *Fritillaria gentneri*, is listed as federally endangered. A study of cattle diets indicates that the bulk of cattle's diet is comprised 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 Allotments, there is one species of graminoid, *Carex serratodens* a member of the sedge family has been documented in the Vestal Butte allotment. The palatability of this sedge to cows is unknown. Because of its wet habitat and its growth of fibrous root masses, *Carex* species generally recover well from herbivory, but severe repeated grazing and trampling could impact populations. The *Carex serratodens* population in Vestal Butte is located in a perpetually moist draw. There were no impacts reported to the site from grazing in May in 2003 and 2006.

There are six sites of *Fritillaria gentneri* in the Vestal Butte grazing allotment and one site in the Crowfoot allotment. The six sites in the Vestal Butte allotment are all located in one section. Three of the sites are close to roads. Because of the steep terrain, the sites closest to the roads are most susceptible to livestock-caused damage as they use the roads to travel through the allotment and graze the adjacent areas. One *Fritillaria gentneri* site was discovered in 2009 and the other five were discovered in 2010. These sites have not been revisited since their discovery. Grazing use in spring 2001 and spring 2003 was described as light to moderate in this section.

The *Fritillaria gentneri* site in the Crowfoot allotment was first discovered in 2008 during a survey for the PCGP pipeline. When the area was surveyed in 2010 for the grazing allotment lease renewal, additional plants were discovered in the vicinity of the first site. Both visits occurred in April and May when the plants were in bloom and no damage was reported to the flowering plants, although the area was described as actively grazed and weedy with annual grasses.

The effects determination of grazing on *Fritillaria gentneri* is Not Likely to Adversely Affect with the application of Project Design Criteria (PDCs) (BLM 2008, pp 52, 27). To be in accordance with the Biological Opinion (FWS 2008), the BLM must follow the required PDCs for grazing for this species, which include surveying suitable habitat under a 2-year protocol prior to renewing grazing permits, monitoring populations to detect grazing utilization, and implementing protection measures if utilization occurs. Surveys have been completed in all five grazing allotments according to the protocol and all sites will be monitored. If impacts are detected, sites would be protected by changing the timing of release or the grazing system, fencing small populations, or modifying the allotment boundaries. If protection measures are not implemented, consultation would be reinitiated. (BLM 2008, p. 27).

One population of approximately 75 plants of *Chlorogalum angustifolium* was tentatively reported in the Crowfoot allotment. The plants are spread out on a ridge top along a forest and woodland edge that transitions to meadow and chaparral. *Chlorogalum angustifolium* is a perennial forb in the lily family that blooms between April and July. The dry meadow plant community where this population occurs is flat and contains the native bunchgrasses Idaho fescue and California fescue, as well as the nonnative annual grass, hedgehog dogtail (*Cynosurus echinatus*). The site report from 2009 stated there were no signs of grazing in the meadow at that time, but plants could be impacted by grazing or trampling in the future because the meadow contains good grass cover. This population will be verified and monitored to detect impacts from livestock and protection measures would be implemented as needed.

Cypripedium montanum and *Cypripedium fasciculatum* are perennial forbs and members of the orchid family. Habitat includes moist areas, dry slopes and mixed-evergreen or coniferous forest (Hickman 1993). The known populations within the allotments occur in coniferous upland areas that receive no to slight (0-19%) use.

Several Special Status species are small herbaceous annuals that are not at high risk of being grazed because they do not have substantial forage value, but they occur in habitats that could be negatively impacted by livestock from trampling or through alterations in their habitat. *Limnanthes floccosa* ssp. *bellingermaniana* (Bellinger's meadowfoam), *Plagiobothrys greenei* (Greene's popcorn flower), *Plagiobothrys austiniae* Austin's popcornflower, and *Meconella oregana* (white Oregon fairy poppy) bloom in the spring (March – June) and grow in vernal wet meadows or along drainages.

Two populations of *Limnanthes floccosa* ssp. *bellingermaniana* (Bellinger's meadowfoam) were discovered in the Crowfoot allotment. This species grows in vernal wet meadows and blooms in the spring months when cows are turned out. Plants could be negatively impacted when livestock compact the wet soil, creating uneven ground that disrupts the flow of water across the slope. A study of the effects of grazing on the dwarf woolly meadowfoam (*Limnanthes floccosa* ssp. *pumila*), which is closely related to Bellinger's meadowfoam, found that plots exposed to cattle grazing had significantly fewer meadowfoam plants than caged plots, but the difference was not significant a year after livestock grazing was removed. In the same study, trampling indicated that moderate to high levels of trampling resulted in a decrease in plants the following year if it occurred during flowering; whereas trampling when plants were in fruit did not affect the next year's number of flowering plants (Newton et al. 2010). One of the Crowfoot populations is located below a road and when it was discovered in 2001 it contained three plants. When it was revisited in 2010, no plants were observed, but no signs of livestock grazing were reported at the population. The second population is scattered along ¼ mile of an open, rocky drainage. No impacts to the plants were reported from the visits to the site in April and May in 2003 or 2010.

Plagiobothrys greenei and *Plagiobothrys austiniae* also bloom in the spring along drainages and in vernal wet meadows. Both popcorn flowers are small herbaceous plants that do not provide forage for livestock, but they may be grazed along with the surrounding grasses. Because they grow in open areas on vernal saturated soils, they could also be negatively affected from trampling by livestock or by changes in hydrology when cows pass through openings where they occur and compact soils. In the Moser Mountain grazing allotment, one Greene's popcorn flower population was discovered in 2001, but no plants were observed at the site in 2010. One Austin's popcorn flower population was also documented in the Moser Mountain allotment in 2001 with an estimated 500 plants. The site revisit in 2010 extended the population and estimated 1,500 plants. This 40 acre parcel has three AUMs that are turned out during the month of April. Botanical surveys, which have been conducted at this time, have not reported heavy grazing or trampling. These populations are not being directly negatively affected by grazing.

Meconella oregana is a tiny annual herb that blooms and sets seed between March and June. It grows on thin soils, often underneath wedgeleaf ceanothus or on sloping banks of shallow drainages. Its small stature and a habitat lacking substantial forage for cows protect it from being grazed. However, plants are at risk of trampling or impacts from changes in hydrology if cows walk through populations, especially when soils are wet and vulnerable to compaction. Only one population of this species has been reported in the Moser Mountain grazing allotment. As stated above, grazing in this allotment has been reported as light and no impacts were observed at the *Meconella oregana* site in 2010 when it was discovered.

One site of *Arabis modesta* was reported in the Crowfoot grazing allotment, although the identification has not been verified. The 150 plants in the population are growing in a steep, rocky meadow along a road. No evidence of grazing was reported when the population was discovered 2009; however, plants could be grazed or trampled as they are growing among native bunchgrasses that would be attractive to livestock. This population will be verified and monitored to detect future impacts from livestock.

Ranunculus austro-oreganus is a broadleaved, perennial forb that is somewhat toxic, and generally avoided by livestock. A population of scattered patches of 10 to 25 plants was documented in the Moser Mountain grazing allotment in 2001 in a mixed hardwood-conifer stand. No impacts to the population were observed in 2001 or during a revisit to the site in 2010.

Cheilanthes intertexta grows in crevasses in boulders or rock cliffs where livestock are unable to access because of the steep unstable terrain. The one population which occurs in the Crowfoot grazing allotment would not be impacted from livestock grazing.

In addition to potential direct impacts from grazing or trampling described above, Special Status plant populations could also be negatively affected if livestock grazing results in an increase in noxious weeds. Weeds may be introduced on the hooves, hair, or feces of cows or through other human or natural processes. The sites most vulnerable to weed invasion are areas that receive high use by livestock, such as congregating areas - salt blocks, water sources, shade, and loading areas. Noxious weeds compete with native plants, including Special Status species, for water, light, space, and nutrients. Over time noxious weeds can dominate a site, crowding out Special Status plants. At this time, no federal Endangered or Bureau Sensitive plant populations in the five grazing allotments receive heavy livestock use or are at risk from noxious weeds. Monitoring sites and treating noxious weeds if they become a threat would prevent future effects to Special Status plants from noxious weeds potentially introduced by livestock. Only one site of one Special Status nonvascular species, the liverwort *Porella bolanderi*, occurs in the Crowfoot grazing allotment. *Porella bolanderi* forms shaded to partly exposed mats on a variety of rock types and trunks of *Quercus*, *Umbellularia*, and *Acer macrophyllum* (Piippo and Norris 1996). The population in the Crowfoot allotment is growing on a sheltered face of an otherwise exposed rock outcrop in an oak woodland. Because of its protected location on rock, grazing would not impact this species.

There are four species of special status fungi with 16 populations within the allotments; *Clavariadelphus sachalinensis* (Season: June-October), *Sowerbyella rhenana* (Season: October-December), *Ramaria rubripermanens* (Season: June and October), and *Tremiscus helvelloides* (Season: August-October.). All of these species are associated with conifer forests where livestock seldom forage. *Sowerbyella rhenana* and *Tremiscus helvelloides* fruit outside the grazing season for these allotments. The risk to these fungi from grazing is none to very low.

Noxious Weeds and Introduced Plant Species

“Noxious Weed” describes any plant classified by the Oregon State Department of Agriculture (ODA) 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 (ODA Noxious Weed Program). Field surveys have located populations of 8 species of B-Designated noxious weeds within the allotments (Table 5).

The Rangeland Health Assessments conducted in the spring of 2011 indicate that for indicator 16; Invasive plants, there is a Moderate to Extreme departure from the Ecological Site Description at the Loamy shrub scabland site, the Clayey Hills site and one of the Loamy hills sites. There is a Moderate departure at the Loamy hills site in the Crowfoot allotment, due to the presence of introduced (non-native) grass species. The Shallow Mountain Slopes sight is rated as Slight to Moderate departure from the Ecological Site Description and the Pine-Douglas fir-Fescue are both rated as None to Slight departure from what would be expected at those ecological sites. 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 7. Noxious Weed Species

| Scientific Name | Common Name | Allotment Name | Occurrences |
|-----------------------------------|---------------------------------|--|--------------|
| <i>Centaurea solstitialis</i> | Yellow starthistle | Crowfoot, Vestal Butte, Neil Tarbell, Moser Mountain | 24, 22, 3, 1 |
| <i>Centaurea diffusa</i> | Diffuse knapweed | Neil Tarbell | 1 |
| <i>Centaurea nigrescens</i> | Tyrol knapweed | Crowfoot | 1 |
| <i>Cirsium arvense</i> | Canada thistle | Vestal Butte | 1 |
| <i>Cytisus scoparius</i> | Scotch broom | Crowfoot, Vestal Butte | 5, 1 |
| <i>Rubus armeniacus</i> | Armenian (Himalayan) blackberry | Bear Mountain, Moser Mountain, Crowfoot | 1,1,4 |
| <i>Taeniatherum caput-medusae</i> | Medusahead rye | All | Widespread |

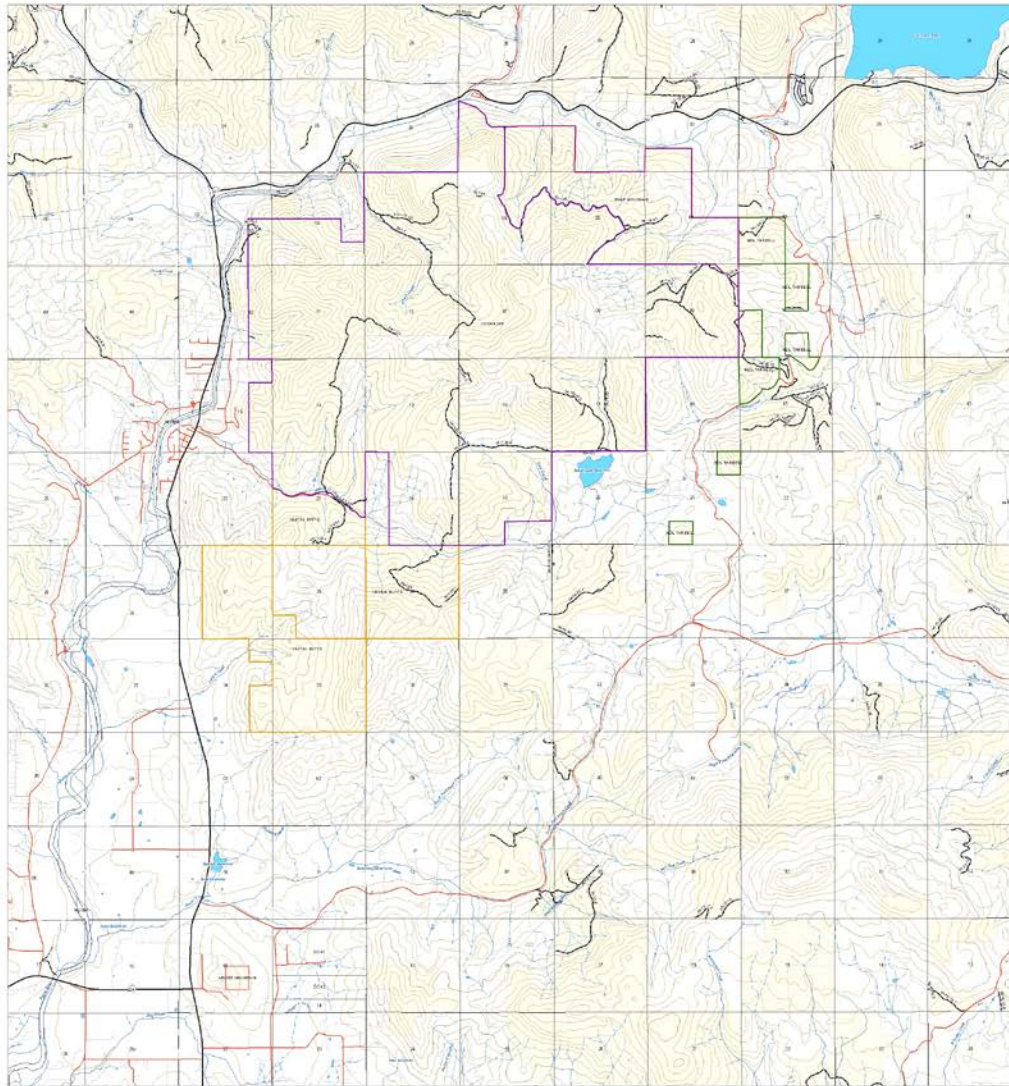
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APPENDIX A. Allotment Map

Bear Mountain, Crowfoot, Vestal Butte, Moser Mtn., Neil Tarbell



0 0.5 1 2 Miles

2011 RHFA Allotments

- BEAR MOUNTAIN
- CROWFOOT
- MOSER MOUNTAIN
- NEIL TARBELL
- VESTAL BUTTE

Road

- Bureau of Land Management
- County route
- Forest Service
- Other state route
- Municipal route (urban, residential, etc.)
- Private road (no symbol)
- Not Known

1:24,945



Resource Area: Butte Falls
 Map Created On: March 9, 2011

This Map Was created using the Map Series Extension.
 The map series grid was designed by Sean Mohren, District
 Wildlife/Botany Data Steward, Medford BLM.
 541-618-2530

NAD 83 - Zone 10

APPENDIX B. RANGELAND HEALTH FIELD ASSESSMENT SUMMARY OF FINDINGS

Rangeland Health is defined as the degree in which the integrity of the soil, vegetation, water, and air as well as the ecological processes of the rangeland ecosystem are balanced and sustained (USDA 1997). This qualitative assessment along with quantitative monitoring data is an attempt to look at how well ecological processes such as the water cycle (capture, storage, and safe release of precipitation), energy flow (conversion of sunlight to plant and then animal matter), and nutrient cycle (the cycle of nutrients through the physical and biotic components of the environment) are functioning. The product of this qualitative assessment is not a single rating of rangeland health, but an assessment of three interrelated attributes: soil/site stability, hydrologic function, and biotic integrity. Attributes are rated based on what would be expected for the site or a “reference state” based on soils, climate and topography compared to the current state. The attributes are split into seventeen indicators that are rated as none-to-slight, slight-to-moderate, moderate, moderate-to-extreme, and extreme-to-total departures from the reference state (Table 1-7).

Rangeland Health Field Assessments were completed at seven sites in five different ecological sites on the Crowfoot, Bear Mountain, Vestal Butte, Neil Tarbell and Moser Mountain Allotments. The ecological sites were chosen by using GIS (Global Information Systems) mapping that defined vegetative communities and soils followed by field surveys to determine a representative location to complete the assessments. The assessments were completed with an interdisciplinary team (IDT).

Vestal Butte Grazing Allotment

Location 1: Loamy Shrub Scabland

The overall rating for this location is a slight-to-moderate departure from what would be expected for this site. Fifteen indicators (88 percent) were rated none-to-slight, one indicator (six percent) was rated slight-to-moderate, none of the indicators were rated moderate, one of the indicators (six percent) was rated moderate-to-extreme and none of the indicators were rated extreme-to-total.

Photo 1. Photo taken at the Loamy Shrub Scabland ecological site.



Table 1: Vestal Butte RHFA location 1 indicator summary

| Location 1: Loamy Shrub Scabland | |
|---|---|
| Indicator | Degree of Departure from Ecological Site Description |
| | |

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

Neil Tarbell Grazing Allotment

Location 2: Pine-Douglas fir-Fescue

The overall rating for this location is a none-to-slight departure from what would be expected for this site. All Seventeen indicators (100 percent) were rated none-to-slight, none of the indicators were rated slight-to-moderate, moderate, moderate-to-extreme and extreme-to-total.

Photo 2. Photo taken at the Pine-Douglas fir-Fescue ecological site.



Table 2: Neil Tarbell RHFA location 2 indicator summary

| Location 2: Pine-Douglas fir-Fescue | | | | | |
|---|---|---------------------|----------|--------------------|----------------|
| Indicator | Degree of Departure from Ecological Site Description | | | | |
| | Extreme | Moderate to Extreme | Moderate | Slight to Moderate | None to Slight |
| 1. Rills | | | | | ✓ |
| 2. Water Flow Patterns | | | | | ✓ |
| 3. Pedestals and/or Terracettes | | | | | ✓ |
| 4. Bareground | | | | | ✓ |
| 5. Gullies | | | | | ✓ |
| 6. Windscored Blowouts | | | | | ✓ |
| 7. Litter movement | | | | | ✓ |
| 8. Soil surface resistance to erosion | | | | | ✓ |
| 9. Soil surface loss or degradation | | | | | ✓ |
| 10. Plant community composition and distribution relative to infiltration | | | | | ✓ |
| 11. Compaction Layer | | | | | ✓ |
| 12. Functional/Structural groups | | | | | ✓ |

| | | | | | |
|---|--|--|--|--|---|
| 13. Plant mortality/ decadence | | | | | ✓ |
| 14. Litter amount | | | | | ✓ |
| 15. Annual Production | | | | | ✓ |
| 16. Invasive Plants | | | | | ✓ |
| 17. Reproductive capability of Perennial plants | | | | | ✓ |

Moser Mountain Grazing Allotment

Location 3: Loamy Hills

The overall rating for this location is a slight departure from what would be expected for this site. Fifteen indicators (88 percent) were rated none-to-slight, one indicator (six percent) was rated slight-to-moderate, one indicator (6 percent) was rated moderate, and none of the indicators were rated moderate-to-extreme or extreme-to-total.

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



Table 3: Moser Mountain RHFA location 3 indicator summary

| Location 3: Loamy Hills | | | | | |
|---------------------------------|---|---------------------|----------|--------------------|----------------|
| Indicator | Degree of Departure from Ecological Site Description | | | | |
| | Extreme | Moderate to Extreme | Moderate | Slight to Moderate | None to Slight |
| 1. Rills | | | | | ✓ |
| 2. Water Flow Patterns | | | | | ✓ |
| 3. Pedestals and/or Terracettes | | | | | ✓ |
| 4. Bareground | | | | | ✓ |

| | | | | | |
|---|--|---|--|---|---|
| 5. Gullies | | | | | ✓ |
| 6. Windscored Blowouts | | | | | ✓ |
| 7. Litter movement | | | | | ✓ |
| 8. Soil surface resistance to erosion | | | | | ✓ |
| 9. Soil surface loss or degradation | | | | | ✓ |
| 10. Plant community composition and distribution relative to infiltration | | | | | ✓ |
| 11. Compaction Layer | | | | | ✓ |
| 12. Functional/Structural groups | | | | ✓ | |
| 13. Plant mortality/ decadence | | | | | ✓ |
| 14. Litter amount | | | | | ✓ |
| 15. Annual Production | | | | | ✓ |
| 16. Invasive Plants | | ✓ | | | |
| 17. Reproductive capability of Perennial plants | | | | | ✓ |

Crowfoot Grazing Allotment

Location 4: Loamy Hills

The overall rating for this location is a slight departure from what would be expected for this site. Sixteen indicators (94 percent), one indicator (6 percent) was rated moderate, and none of the indicators were rated slight-to-moderate, moderate-to-extreme or extreme-to-total.

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



Table 4: Crowfoot RHFA location 4 indicator summary

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

Location 5: Shallow Mountain Slopes

The overall rating for this location is a none-to-slight departure from what would be expected for this site. Sixteen indicators (94 percent) were rated none-to-slight, one indicator (six percent) was rated slight-to-moderate, and none of the indicators were rated moderate, moderate-to-extreme or extreme-to-total.

Photo 1. Photo taken at the Shallow Mountain Slopes ecological site.



Table 5: Crowfoot RHFA location 5 indicator summary

| Location 5: Shallow Mountain Slopes | | | | | |
|---|---|---------------------|----------|--------------------|----------------|
| Indicator | Degree of Departure from Ecological Site Description | | | | |
| | Extreme | Moderate to Extreme | Moderate | Slight to Moderate | None to Slight |
| 1. Rills | | | | | ✓ |
| 2. Water Flow Patterns | | | | | ✓ |
| 3. Pedestals and/or Terracettes | | | | | ✓ |
| 4. Bareground | | | | | ✓ |
| 5. Gullies | | | | | ✓ |
| 6. Windscored Blowouts | | | | | ✓ |
| 7. Litter movement | | | | | ✓ |
| 8. Soil surface resistance to erosion | | | | | ✓ |
| 9. Soil surface loss or degradation | | | | | ✓ |
| 10. Plant community composition and distribution relative to infiltration | | | | | ✓ |
| 11. Compaction Layer | | | | | ✓ |
| 12. Functional/Structural groups | | | | | ✓ |

| | | | | | |
|---|--|--|--|---|---|
| 13. Plant mortality/ decadence | | | | | ✓ |
| 14. Litter amount | | | | | ✓ |
| 15. Annual Production | | | | | ✓ |
| 16. Invasive Plants | | | | ✓ | |
| 17. Reproductive capability of Perennial plants | | | | | ✓ |

Bear Mountain Grazing Allotment

Location 6: Clayey Hills

The overall rating for this location is a slight departure from what would be expected for this site. Fourteen indicators (82 percent) were rated none-to-slight, two indicators (twelve percent) was rated slight-to-moderate, one indicator (6 percent) was rated moderate-to-extreme, and none of the indicators were rated moderate or extreme-to-total.

Photo 1. Photo taken at the Clayey Hills ecological site.



Table 6: Bear Mountain RHFA location 6 indicator summary

| Location 6: Clayey Hills | | | | | |
|---------------------------------|---|---------------------|----------|--------------------|----------------|
| Indicator | Degree of Departure from Ecological Site Description | | | | |
| | Extreme | Moderate to Extreme | Moderate | Slight to Moderate | None to Slight |
| 1. Rills | | | | | ✓ |
| 2. Water Flow Patterns | | | | | ✓ |
| 3. Pedestals and/or Terracettes | | | | | ✓ |
| 4. Bareground | | | | | ✓ |

| | | | | | |
|---|--|---|--|---|---|
| 5. Gullies | | | | | ✓ |
| 6. Windscored Blowouts | | | | | ✓ |
| 7. Litter movement | | | | | ✓ |
| 8. Soil surface resistance to erosion | | | | | ✓ |
| 9. Soil surface loss or degradation | | | | | ✓ |
| 10. Plant community composition and distribution relative to infiltration | | | | | ✓ |
| 11. Compaction Layer | | | | | ✓ |
| 12. Functional/Structural groups | | | | ✓ | |
| 13. Plant mortality/ decadence | | | | ✓ | |
| 14. Litter amount | | | | | ✓ |
| 15. Annual Production | | | | | ✓ |
| 16. Invasive Plants | | ✓ | | | |
| 17. Reproductive capability of Perennial plants | | | | | ✓ |

Location 7: Pine-Douglas fir-Fescue

The overall rating for this location is a none-to-slight departure from what would be expected for this site. All Seventeen indicators (100 percent) were rated none-to-slight, and none of the indicators were rated slight-to-moderate, moderate, moderate-to-extreme or extreme-to-total.

Photo 1. Photo taken at the Pine-Douglas fir-Fescue ecological site.



Table 7: Bear Mountain RHFA location 7 indicator summary

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

Photo 1. Poor drainage on road 34S-01E-3.01 in the Bear Mountain grazing allotment.



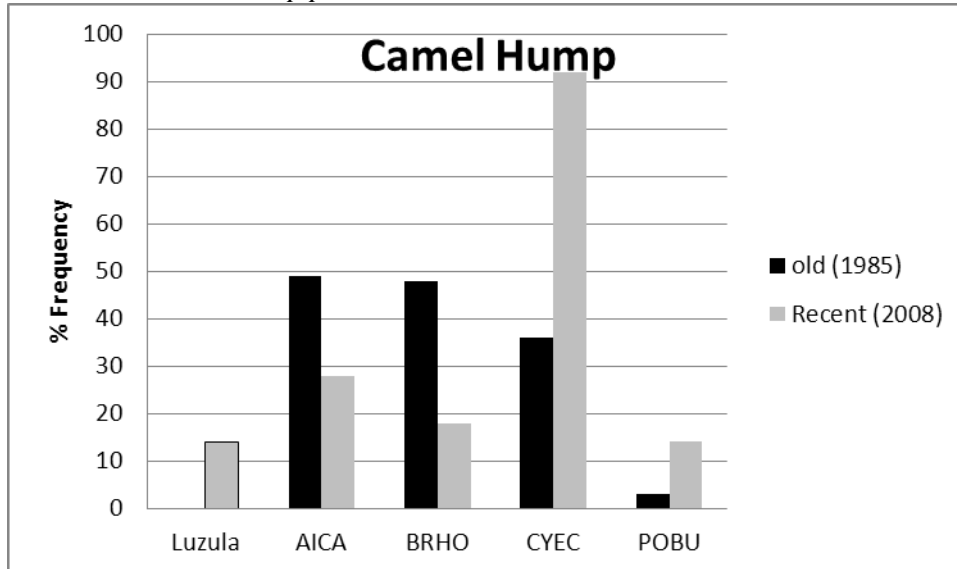
Photo 2. Road 34S-01E-3.01 in the Bear Mountain grazing allotment.



APPENDIX C. Range Trend Plot Data

Five Nested Frequency transects were established in the late 1980s. Three of the trend plots are in the Crowfoot allotment and one in Bear Mountain and Vestal Butte Allotments. One of the transects within the Crowfoot allotment could not be relocated. The data from that transect is not analyzed in this summary it was completed once in 1988 and again in 1999 and would not be an indicator of trend for the last ten year lease period. Frequency is derived from 100 nested plots (Plot 1, 5x5 cm; Plot 2, 25x25 cm; Plot 3, 25x50 cm; Plot 4, 50x50 cm) along a 100-foot transect (the macro-plot). Data is collected for ten frames along mini-transects (alternating left and right) every 3.5 feet along a 35 foot transect. Each time the quadrat frame is placed on the ground, the observer records the smallest size plot within which a species occurs. This allows determination of frequency for three plot sizes. Each plot size is analyzed for significant change by species for individual transects using Chi-square analysis comparing the oldest to the most recent data collection. Chi-square analysis was used to examine presence and absence within individual plots for comparison years following Elzinga *et al.* (1998), and considered significant at a probability level of 0.1. The probability value used to ascertain statistical significance was adjusted by the number of species tested resulting in a Bonferroni adjustment.

Figure 1. The collection of trend data using the Nested Frequency Method was collected in the Crowfoot Allotment's Camel Hump pasture at the transect in 34S 1E section 7 in 1985, 1994, 1999 and 2008.

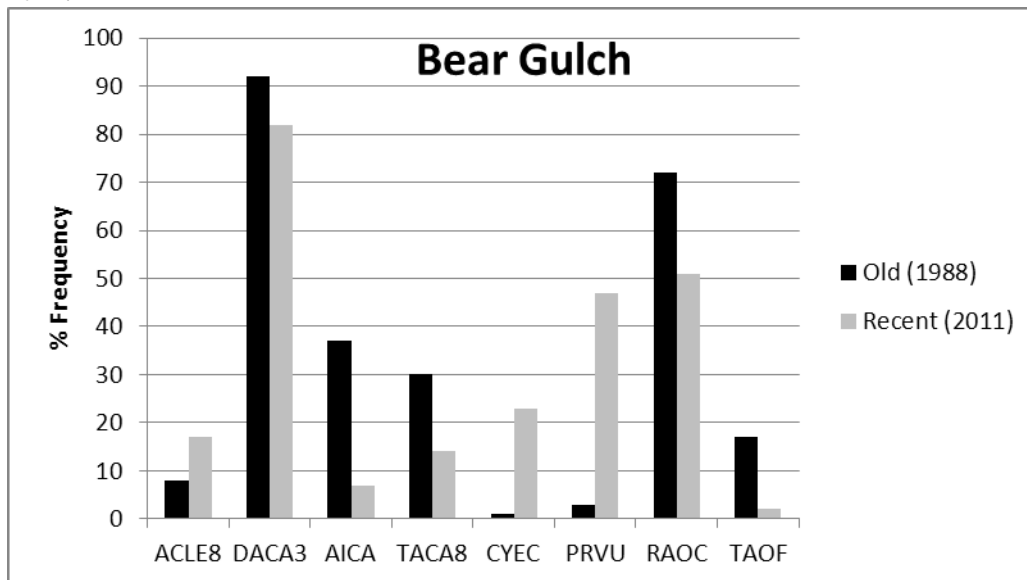


When comparing the oldest data to the data most recently collected the species showing significant change include an increase in native, perennial, grass-like woodrush (*Luzula sp.*). There is a decrease in silver hairgrass (*Aira caryophyllea*) and soft brome (*Bromus hordeaceus*) and an increase in bristly dogstail (*Cynosurus echinatus*) and bulbous blue grass (*Poa bulbosa*) these species are non-native, invasive, annual grasses. The trend for this site is static to downward, there is shifting between species of non- native annual grasses with a net increase of 10% frequency of these annual grasses.

Photo taken at the Camel Hump nested frequency transect August 13, 2008



Figure 2. The collection of trend data using the Nested Frequency Method data was collected in the Crowfoot Allotment's Bear Gulch Pasture at the transect in 34S 1E section 19 in 1988, 1994, 1999, and in 2011.

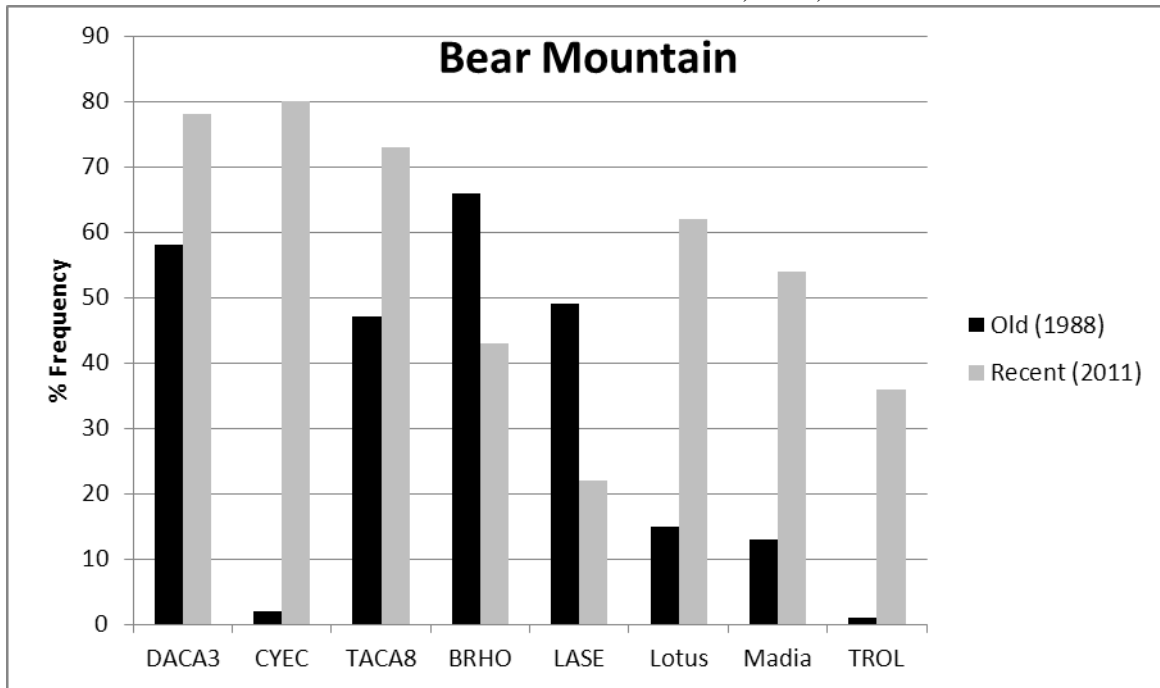


Species showing significant change include an increase in Lemmon's needlegrass (*Achnatherum lemmonii*) and a decrease in California oatgrass (*Danthonia californica*); these species are native, perennial bunchgrasses. Two non-native, invasive, annual grass species show a decrease in frequency; medusahead (*Taeniatherum caput-medusae*) and silver hairgrass (*Aira caryophyllaea*) while bristly dogstail (*Cynosurus echinatus*) increased. Forbs showing a significant change include an increase in perennial native forbs such as common selfheal (*prunella vulgaris*) and western buttercup (*Ranunculus occidentalis*), and a decrease in perennial introduced forb common dandelion (*Taraxacum officinale*). The condition of this site is showing a static to upward trend because of the decrease of two non-native annual grasses and overall improvements (significant or not) when analyzing all the years of data.

Photo taken at the Bear Gulch nested frequency transect June 16, 2011



Figure 3. The collection of trend data using the Nested Frequency Method data was collected in the Bear Mountain Allotment at the transect in 34S 1E section 5 in 1988, 1993, 2004 and 2011.



Species showing significant change include California oatgrass (*Danthonia californica*) a native, perennial bunchgrass increased. Two non-native, invasive, annual grass species have increased in frequency; medusahead (*Taeniatherum caput-medusae*), and bristly dogstail (*Cynosurus echinatus*) while soft brome (*Bromus hordeaceus*) is decreasing. Forbs showing a significant change include a decrease in annual non-native forb *Lactuca serriola* and an increase in annual native forbs bird's-foot trefoil (*lotus sp.*), tarweed (*madia sp.*), and few flowered clover (*Trifolium oliganthum*). The condition of this site is showing a downward trend because of the increase in non-native annual grasses. When looking at all of the data collected at this site it was noted that medusahead (figure 3a) has fluctuated in frequency but the bristly

dogstail has steadily increased.

Figure 3a. Frequency of medusahead (*Taeniatherum caput-medusae*) 1988-2011.

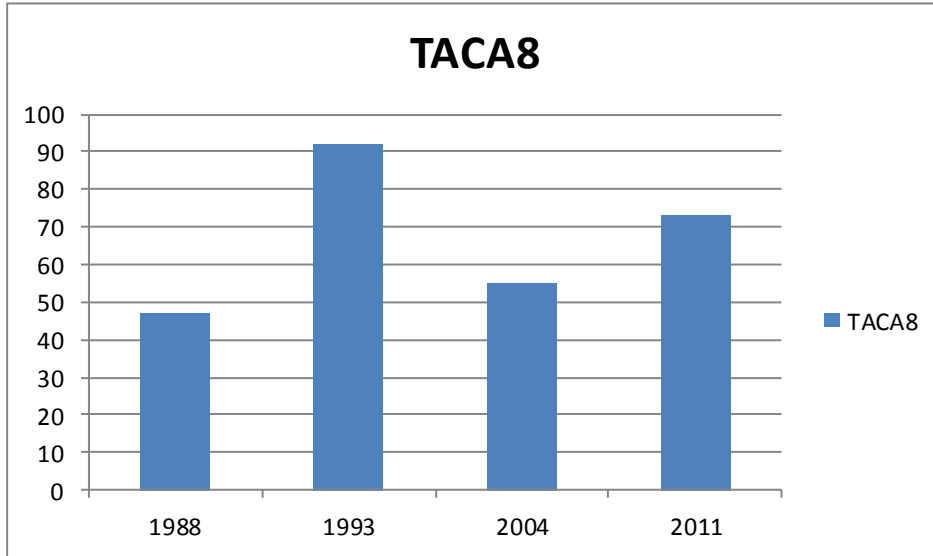
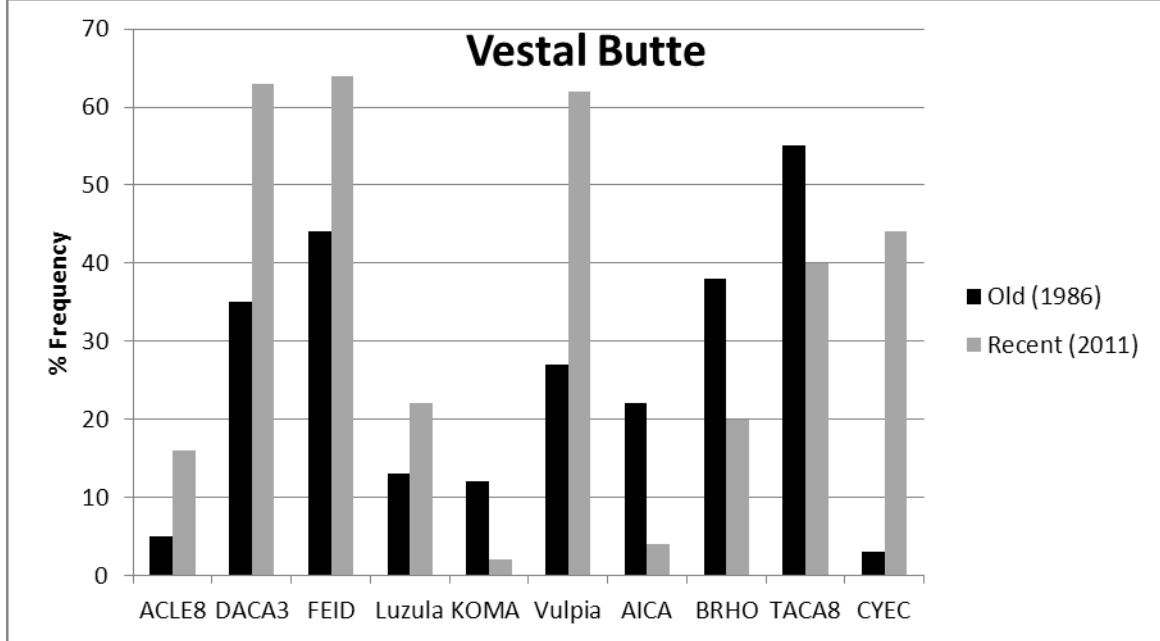


Photo taken at the Bear Mountain nested frequency transect June 30, 2011



Figure 4. The collection of trend data using the Nested Frequency Method data was collected in the Vestal Butte Allotment at the transect in 34S 1W section 35 in 1986, 1991, 1996, 2001 and 2011.



Species showing significant change include an increase in Lemmon’s needlegrass (*Achnatherum lemmonii*), California oatgrass (*Danthonia californica*), Idaho fescue (*Festuca idahoensis*), woodrush (*Luzula sp.*) and a decrease in prairie Junegrass (*Koeleria macrantha*) these species are native, perennial, bunchgrasses, and one grass-like. There were three non-native, invasive, annual grass species with a decrease in frequency; silver hairgrass (*Aira caryophylla*), soft brome (*Bromus hordeaceus*), medusahead (*Taeniatherum caput-medusae*) and a 41% increase in bristly dogstail (*Cynosurus echinatus*) The condition of this site is showing an upward trend because of the increase in native perennial and annual grasses and the overall decrease of non-native annual grasses.

Photo taken at the Vestal Butte nested frequency transect June 22, 2011

