EVALUATION AND DETERMINATION
Achieving the OR/WA Standards for Rangeland Health
and
Conformance with the Guidelines for Livestock Grazing Management

Field Office: _Medford_____ Determination Date(s): July 8, 2008_____
Grazing Allotment Name/Number: _Soda Mountain/10110_____

Standard 1 Watershed Function – Uplands

1 □ Meeting the Standard	5 □ Not Meeting the Standard, cause not determined
2 □ Not Meeting the Standard, but making significant progress towards	
3 □ Not Meeting the Standard, current livestock grazing management practices are **not** significant factors (list important causal agents)	6 □ Conforms with Guidelines for Livestock Grazing Management.
4 ■ Not Meeting the Standard, current livestock grazing management practices are significant factors	7 ■ Does not conform with Guidelines for Livestock Grazing Management

Causal Factors for Non-Achievement:
Several factors influence aspects of upland watershed function. Past management practices (scarification, placement of salt blocks, location of stockponds, timber harvest, historic livestock use), continued fire-suppression, current livestock grazing and existing roads all influence nutrient cycling, water capture and retention, and plant productivity.

Rationale for Determination:
The allotment is considered not to meet Standard 1 because areas of the allotment experiencing moderate to severe average-utilization (15% of the allotment) show noxious weed invasion and gentle slopes favored by livestock at lower elevations show short-lived non-native perennial grass invasion. Annual grasses are being replaced by perennial grasses at some locations, while annual forbs and bulbous bluegrass are increasing at other locations. Localized improvements in nutrient cycling are thus balanced by downward trends at other locations.

The replacement of annual grasses with perennial plants since the 1950/1960s is a strong indication of improvement in watershed function in most locations. Deeper-rooted perennial plants cycle nutrients more effectively than annuals, while the access to deeper lying soil moisture allows for growth longer into the growing season. Other locations associated with moderate to severe average-livestock use show a proliferation of noxious weeds, including annual forbs. Bulbous bluegrass, a short-lived non-native perennial forb is increasing at lower elevation on more gentle southerly slopes. While the increase in

deep-rooted native perennial grasses signifies more productive upland ecosystems, the invasion of annual forbs and bulbous bluegrass also represents a downward trend. The proliferation of woody vegetation due to fire suppression and historic livestock use may result in an increase in summer evapo-transpiration. High road densities may serve to change the flow of water across the landscape. High summer evapo-transpiration and road density in the uplands may influence riparian watershed functions.

The BLM has worked with the lessees to implement the Soda Mountain Coordinated Resource Management Plan (CRMP) through periodic meetings, field trips, and written correspondence. One of the objectives of the CRMP includes achieving proper utilization levels through better livestock distribution. While utilization mapping and transect data shows an overall decrease in utilization over the past decade, there are still areas of concentrated used at seeps, springs, wet meadows, and along streams.

While the observed changes in vegetation can be construed to have both positive and negative influences, the balance of evidence suggests that current livestock use negatively influences upland watershed function to the extent that livestock management on the Soda Mountain Allotment does not meet Rangeland Health Standards for the "Watershed Function – Uplands" component.

Guidelines in Non-Conformance:

- **Livestock Grazing Management**

1. The season, timing, frequency, duration and intensity of livestock grazing use should be based on the physical and biological characteristics of the site and the management unit in order to: (e) to help prevent the increase and spread of noxious weeds (f) maintain or restore diverse plant populations and communities that fully occupy the potential rooting volume of soil (h) promote soil and site conditions that provide the opportunity for the establishment of desirable plants
2. Grazing management plans should be tailored to site-specific conditions and plan objectives. Livestock grazing should be coordinated with the timing of precipitation, plant growth and plant form. Soil moisture, plant growth stage and the timing of peak stream flows are key factors in determining when to graze. Response to different grazing strategies varies with differing ecological sites.
6. Provide periodic rest from grazing for rangeland vegetation during critical growth periods to promote plant vigor, reproduction, and productivity.
7. Range improvement practices should be prioritized to promote rehabilitation and resolve grazing concerns on transitory grazing land.

- **Facilitating the Management of Livestock Grazing**

1. The use of practices to facilitate the implementation of grazing systems should consider the kind and class of animals managed, indigenous wildlife, wild horses, the terrain and the availability of water. Practices such as fencing, herding, water development, and the placement of salt and supplements (where authorized) are used where appropriate to: (a) promote livestock distribution (b) encourage a uniform level of proper grazing use throughout the grazing unit.

Standard 2 Watershed Function – Riparian/Wetland Areas

1 □ Meeting the Standard	5 □ Not Meeting the Standard, cause not determined
2 □ Not Meeting the Standard, but making significant progress towards	
3 □ Not Meeting the Standard, current livestock grazing management practices are **not** significant factors	6 □ Conforms with Guidelines for Livestock Grazing Management.
4 ■ Not Meeting the Standard, current livestock grazing management practices are significant factors	7 ■ Does not conform with Guidelines for Livestock Grazing Management

Causal Factors for Non-Achievement:
Several factors influence the functionality of riparian and wetland areas. Management practices including livestock grazing, timber harvest, road construction, and water withdrawals contribute to elevated fine sediment levels, lack of riparian shade, elevated water temperatures, loss of connectivity, aquatic habitat degradation, and excessively low summer flows.

Rationale for Determination:
Of the causal factors listed (above), current livestock grazing is responsible for overutilization of riparian vegetation, trampled headwater springs, and trampled streamsides reducing water quality by increasing water temperature and fine sediments, and results in not meeting Standard 2.

The BLM has worked with the lessees to implement the Soda Mountain Coordinated Resource Management Plan (CRMP) through periodic meetings, field trips, and written correspondence. One of the objectives of the CRMP includes achieving proper utilization levels through better livestock distribution. Streamside riparian areas have generally improved throughout the Soda Mountain Allotment (Hosten and Whitridge 2007) due to changes in season-of-use and reduction in livestock numbers over the 10-15 years; however, there are exceptions within the heavy to severe cattle use areas. Riparian and wetland areas in this allotment tend to get heavier use than other drier sites and this results in physical function deficiencies that vary from small-scale "hot spots" to drainage level effects.

Repeat photos indicate little improvement of vegetation composition associated with livestock use near seeps and springs. Interdisciplinary teams have identified areas (Letter to Soda Mountain lessees July 27, 2005) where stubble heights do not meet the terms and conditions outlined in the grazing lease (e.g. six inch stubble heights in riparian zones), particularly in the Soda Mountain area of the Keene Creek Pasture. Grazed riparian vegetation allows higher levels of solar radiation to reach water surface in

seeps/springs/streams resulting in increased water temperatures. Grazing pressure on riparian shrubs in heavy to high severity livestock use areas is inhibiting the return of beaver (Hosten and Whitridge 2007) and there are two cases where livestock are influencing the integrity of beaver dams in the Parsnip Lakes area.

Livestock have trampled many headwater springs in the east fork of Camp Creek and Dutch Oven Creek resulting in extensive alteration of the streambed, erosion and export of fine sediments into the main channel, increased exposure to direct sunlight, and potentially high nutrient inputs (Parker 1999). 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 South Fork Keene Creek, Lincoln Creek, Mill Creek, Jenny Creek, and Camp Creek (ODFW 1993, 1997, 2002, and 2003). Active bank erosion is probably contributing fine sediment to all the above listed streams except Keene Creek. ODFW physical habitat surveys (1993, 1991, 1997, 2002, and 2003) found active bank erosion along Camp Creek, Mill Creek, Jenny Creek, and Lincoln Creek. Other sources of information 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). Stream surveys found areas of trampling and extensive soil disturbance in areas of heavy-to-severe livestock use throughout the allotment (BLM Stream Surveys 2000).

Impoundments and diversion dams function as sediment traps, effectively disrupting the natural downstream movement of stream substrate, wood, and nutrients. Small impoundments constructed for watering wildlife and livestock create unnatural levels of grazing impacts upstream and downstream of the impoundment by drawing animals to these areas in summer months when water is scarce.

Guidelines in Non-Conformance:

- **Livestock Grazing Management**

1. The season, timing, frequency, duration and intensity of livestock grazing use should be based on the physical and biological characteristics of the site and the management unit in order to: (i) protect or restore water quality.
2. Grazing management plans should be tailored to site-specific conditions and plan objectives. Livestock grazing should be coordinated with the timing of precipitation, plant growth and plant form. Soil moisture, plant growth stage and the timing of peak stream flows are key factors in determining when to graze. Response to different grazing strategies varies with differing ecological sites.

- **Facilitating the Management of Livestock Grazing**

1. The use of practices to facilitate the implementation of grazing systems should consider the kind and class of animals managed, indigenous wildlife, wild horses, the terrain and the availability of water. Practices such as fencing, herding, water development, and the placement of salt and supplements (where authorized) are used where appropriate to: (a) promote livestock distribution (b) encourage a uniform level of proper grazing use throughout the grazing unit (c) avoid unwanted or damaging concentrations of livestock on streambanks, in riparian areas and other sensitive areas

such as highly erodible soils, unique wildlife habitats and plant communities (d) protect water quality

2. Roads and trails used to facilitate livestock grazing are constructed and maintained in a manner that minimizes the effects on landscape hydrology; concentration of overland flow, erosion and sediment transport are prevented; and subsurface flows are retained.

- **Accelerating Rangeland Recovery**

3. Structural and vegetative treatments and animal introductions in riparian and wetland areas must be compatible with the capability of the site, including the system's hydrologic regime, and contribute to the maintenance or restoration of properly functioning condition.

Standard 3 Ecological Processes

1 □ Meeting the Standard	5 □ Not Meeting the Standard, cause not determined
2 □ Not Meeting the Standard, but making significant progress towards	
3 □ Not Meeting the Standard, current livestock grazing management practices are not significant factors	6 □ Conforms with Guidelines for Livestock Grazing Management.
4 ■ Not Meeting the Standard, current livestock grazing management practices are significant factors	7 ■ Does not conform with Guidelines for Livestock Grazing Management

Causal Factors for Non-Achievement:

Historic vegetation manipulation, road construction, fire suppression, and current livestock impacts associated with moderate to severe average-utilization all negatively influence ecological processes. Soil mineralogy predisposes weed invasion to soils with an abundance of shrink-swell clays. Topographic factors (elevation, slope, aspect) influence ecological processes by how they moderate the environment and influence the dispersion of livestock.

Rationale for Determination:

Because substantial areas of moderate to severe average livestock use enhances the establishment and spread of broadleaved weeds and result in altered successional processes, Standard 3 is not met. Altered successional processes are also occurring in riparian vegetation due to livestock grazing.

Invasion of broadleaved weeds in the Agate Flat, Skookum, Oregon Gulch, and Keene Creek pastures and invasion of bulbous bluegrass at lower elevations are evidence of altered plant community successional processes within the uplands of the Soda Mountain Allotment in areas of moderate to severe average livestock use. Increased rates of riparian vegetation improvement in protected streamside riparian areas and seeps and springs are

evidence of altered plant community successional processes in unprotected riparian areas (both streamside as well as seeps and springs). See discussion of the Soda Mountain CRMP above.

Other ecological processes (fire), ecosystem stressors (soils with shrink-swell clays), and management factors (proximity to roads, proximity to water, past management actions) serve to confuse the relation between livestock and ecological function. However, many of the confounding factors are themselves a consequence of the livestock management framework.

The influence of livestock on plant succession precludes the Soda Mountain Allotment from meeting the standard for ecological processes.

Guidelines in Non-Conformance:

- **Livestock Grazing Management**

1. The season, timing, frequency, duration and intensity of livestock grazing use should be based on the physical and biological characteristics of the site and the management unit in order to: (a) provide adequate cover (live plants, plant litter and residue) to promote infiltration, conserve soil moisture and to maintain soil stability in upland areas
2. Grazing management plans should be tailored to site-specific conditions and plan objectives. Livestock grazing should be coordinated with the timing of precipitation, plant growth and plant form. Soil moisture, plant growth stage and the timing of peak stream flows are key factors in determining when to graze. Response to different grazing strategies varies with differing ecological sites.
7. Range improvement practices should be prioritized to promote rehabilitation and resolve grazing concerns on transitory grazing land.

- **Facilitating the Management of Livestock Grazing**

1. The use of practices to facilitate the implementation of grazing systems should consider the kind and class of animals managed, indigenous wildlife, wild horses, the terrain and the availability of water. Practices such as fencing, herding, water development, and the placement of salt and supplements (where authorized) are used where appropriate to: (a) provide adequate cover (live plants, plant litter and residue) to promote infiltration, conserve soil moisture and to maintain soil stability in upland areas (b) encourage a uniform level of proper grazing use throughout the grazing unit (c) avoid unwanted or damaging concentrations of livestock on streambanks, in riparian areas and other sensitive areas such as highly erodible soils, unique wildlife habitats and plant communities.

Standard 4 Water Quality

1□ Meeting the Standard	5 □ Not Meeting the Standard, cause not determined
2 □ Not Meeting the Standard, but making significant progress towards	
3 □ Not Meeting the Standard, current livestock grazing management practices are not significant factors	6 □ Conforms with Guidelines for Livestock Grazing Management.
4 ■ Not Meeting the Standard, current livestock grazing management practices are significant factors	7 ■ Does not conform with Guidelines for Livestock Grazing Management

Causal Factors for Non-Achievement:
Several factors influence water quality in this allotment. Management practices (conversion of seep and springs to stockponds, road construction, timber harvest, historic livestock use), current livestock grazing and high road densities all influence water quality in streams and seeps and springs.

Rationale for Determination:
Seven streams (Jenny, Mill, Keene, South Fork Keene, Tyler, Carter, and Emigrant Creeks) in the Soda Mountain Allotment are on the Oregon DEQ's 2004/2006 Clean Water Act Section 303(d) list for failing to meet temperature (summer) standards (ODEQ 2006). Emigrant Creek is also listed for flow modification. Riparian plant structure influences water quality by shading and providing for appropriate stream structure, thus maintaining lower water temperature.

The BLM has worked with the lessees to implement the Soda Mountain Coordinated Resource Management Plan (CRMP) through periodic meetings, field trips, and written correspondence. One of the objectives of the CRMP includes achieving proper utilization levels through better livestock distribution. While utilization mapping and transect data shows an overall decrease in utilization over the past decade, there are still areas of concentrated used at seeps, springs, wet meadows, and along streams.

Livestock concentrate at seeps and springs, especially those that have been converted to stockponds. This results in higher water temperatures; lower levels of dissolved oxygen; reduction in disturbance-intolerant macroinvertebrate taxa; increased fine sediment; and loss of riparian vegetation (lack of overhanging and streamside vegetation) (Barr et al. 2007; Parker 1999; Hosten 2007b; Hosten and Whitridge 2007). These stockponds create unnatural levels of grazing impacts upstream and downstream of the impoundment by drawing animals to these areas in summer months when water is scarce. These effects also occur at seeps and springs that have not been converted to stock ponds.

Streamside macroinvertebrate monitoring in the monument showed lower macroinvertebrate richness in South Fork Keene Creek in areas of localized disturbance by livestock (Barr et al. 2007). On Jenny Creek, a low/poor cold water taxa rating and severe truncation of the macroinvertebrate community result from high summer water temperatures, lack of large wood, detrital inputs, and embeddedness. In Mill Creek, embeddedness and complexity were limiting factors (Aquatic Biology Associates 1995, 2000).). Increased fine sediment levels from livestock grazing fill interstitial spaces and cover substrates critical for invertebrate production.

Guidelines in Non-Conformance:

- **Livestock Grazing Management**

1.The season, timing, frequency, duration and intensity of livestock grazing use should be based on the physical and biological characteristics of the site and the management unit in order to: (b) provide adequate cover and plant community structure to promote streambank stability, debris and sediment capture, and floodwater energy dissipation in riparian areas (i) protect or restore water quality.

2. Grazing management plans should be tailored to site-specific conditions and plan objectives. Livestock grazing should be coordinated with the timing of precipitation, plant growth and plant form. Soil moisture, plant growth stage and the timing of peak stream flows are key factors in determining when to graze. Response to different grazing strategies varies with differing ecological sites.

- **Facilitating the Management of Livestock Grazing**

1. The use of practices to facilitate the implementation of grazing systems should consider the kind and class of animals managed, indigenous wildlife, wild horses, the terrain and the availability of water. Practices such as fencing, herding, water development, and the placement of salt and supplements (where authorized) are used where appropriate to: (a) promote livestock distribution; (b) encourage a uniform level of proper grazing use throughout the grazing unit; (c) avoid unwanted or damaging concentrations of livestock on streambanks, in riparian areas and other sensitive areas such as highly erodible soils, unique wildlife habitats and plant communities; and (d) protect water quality.

2. Roads and trails used to facilitate livestock grazing are constructed and maintained in a manner that minimizes the effects on landscape hydrology; concentration of overland flow, erosion and sediment transport are prevented; and subsurface flows are retained.

- **Accelerating Rangeland Recovery**

3. Structural and vegetative treatments and animal introductions in riparian and wetland areas must be compatible with the capability of the site, including the system's hydrologic regime, and contribute to the maintenance or restoration of properly functioning condition.

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

1 □ Meeting the Standard	5 □ Not Meeting the Standard, cause not determined
2 □ Not Meeting the Standard, but making significant progress towards	
3 □ Not Meeting the Standard, current livestock grazing management practices are not significant factors	6 □ Conforms with Guidelines for Livestock Grazing Management.
4 ■ Not Meeting the Standard, current livestock grazing management practices are significant factors	7 ■ Does not conform with Guidelines for Livestock Grazing Management

Causal Factors for Non-Achievement:
Several factors influence abundance and distribution of native, T&E, and locally important species in this allotment. Past management practices (scarification, placement of salt blocks, location of stockponds, timber harvest, historic livestock use), current livestock grazing, fire suppression, environmental factors (elevation, slope, aspect, soils), and high road densities all influence T&E and locally important species.

Rationale for Determination:
Because current livestock grazing alters reproduction and patterns of plants, increases water temperatures, tramples vegetation in seeps, springs, and streambanks, and overutilizes wet meadows, Standard 5 is not met. In addition, current grazing practices are likely affecting the populations of several special status species.

Exclosure cages indicate that livestock reduce plant size and reproduction of *Calochortus greenei* in high livestock use areas (Menke and Kaye 2006). Patterns of noxious weeds (yellow starthistle, Canada thistle) are associated with livestock grazing and trampling in moderate to severe forage use areas (15 percent of the allotment), as well as with other disturbances and edaphic factors (Hosten 2007a).

Livestock grazing negatively affects aquatic organisms in this allotment. Increased water temperatures stress aquatic species dependent on cold water (especially trout and pebblesnails). Trampling in seeps/springs and along streams compromises the physical integrity of these environments by increasing compaction, inappropriately altering the width:depth ratio, causing sedimentation, and simplifying habitat. Livestock use, especially in wet areas, changes flow patterns in these naturally sensitive sites. Increased fine sediment levels from livestock grazing fill interstitial spaces and cover substrates critical for invertebrate production. 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.

Several BLM Special Status terrestrial wildlife species are negatively affected by the grazing operations in the Soda Mountain allotment. The moderate to severe average utilization in the riparian areas and "wet meadows" produces the greatest negative impacts to native wildlife species. The foothill yellow-legged frog and northwestern pond turtle (BLM sensitive species) are dependent on riparian and aquatic habitat and are negatively affected when these habitats are degraded by cattle. Habitat degradation occurs through streambank trampling and wading in shallow ponds, springs, and streams.

A complex of wet meadows in the allotment is occupied by the Mardon skipper, a federal candidate species. These meadows are overutilized which reduces plants used by this species for nectaring and ovipositing. The impact of grazing to these habitat components likely reduces reproduction for this species. The primary threat listed for each of these sites is grazing (Xerces 2007, Hosten 2007c).

Although not associated with riparian or aquatic habitat, the Siskiyou short-horned grasshopper (BLM sensitive species) is known to occur at one location within the allotment. It appears to be dependent on elderberry for the egg-laying phase of its life cycle. Cattle impact elderberry through rubbing and/or browsing and this has been noted at the known site. Siskiyou short-horned grasshoppers are actively feeding and reproducing from July through September and are likely to be impacted by reduction of elderberry vegetation and by grass and forb resources which they depend on for food and protective cover.

See discussion of the Soda Mountain Allotment CRMP above.

Guidelines in Non-Conformance:

- **Livestock Grazing Management**

1. The season, timing, frequency, duration and intensity of livestock grazing use should be based on the physical and biological characteristics of the site and the management unit in order to: (e) help prevent the increase and spread of noxious weeds; (h) promote soil and site conditions that provide the opportunity for the establishment of desirable plants; (i) protect or restore water quality; and (j) provide for the life cycle requirements, and maintain or restore the habitat elements of native (including T&E, special status, and locally important species) and desired plants and animals.
2. Grazing management plans should be tailored to site-specific conditions and plan objectives. Livestock grazing should be coordinated with the timing of precipitation, plant growth and plant form. Soil moisture, plant growth stage and the timing of peak stream flows are key factors in determining when to graze. Response to different grazing strategies varies with differing ecological sites.
6. Provide periodic rest from grazing for rangeland vegetation during critical growth periods to promote plant vigor, reproduction and productivity.

- **Facilitating the Management of Livestock Grazing**

1. The use of practices to facilitate the implementation of grazing systems should consider the kind and class of animals managed, indigenous wildlife, wild horses, the terrain and the availability of water. Practices such as fencing, herding, water development, and the placement of salt and supplements (where authorized) are used

where appropriate to: (a) promote livestock distribution; (b) encourage a uniform level of proper grazing throughout the unit; (c) avoid unwanted or damaging concentrations of livestock on streambanks, in riparian areas and other sensitive areas such as highly erodible soils, unique wildlife habitats and plant communities; and (d) protect water quality.

- **Accelerating Rangeland Recovery**

3. Structural and vegetative treatments and animal introductions in riparian and wetland areas must be compatible with the capability of the site, including the system's hydrologic regime, and contribute to the maintenance or restoration of properly functioning condition.

/s/ John Gerritsma 7/8/08

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John Gerritsma Date
Field Manager
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