Standards for Rangeland Health
and
Guidelines for Livestock Grazing Management
for
Public Lands in Oregon and Washington

Rangeland Health Assessment Update for the

Squaw Butte Allotment #00915

September 2014

The original Squaw Butte Allotment Rangeland Health Assessment was conducted in 2007. In 2007, all 5 Standards were being met. This assessment includes the Rogers, Lava, and West pastures used by Iverson. There are 1,000 active AUMs of forage allocated on 8,154 acres of public land and 395 acres of other land. The allotment is grazed in the spring and summer under a rest rotation grazing system.

There are 3 long-term trend photo plots in the allotment and a summary of these trend plots is included in Table 2. The long-term trend plots are associated with vegetation transects consisting of a Nested Frequency transect and photos. Transects were established in 1981 in the West and Rogers Pastures and in 1989 in the Lava Pasture. The vegetation data for three transects are summarized in Tables 4-6.

A summary of the health assessment of 2007 and an updated assessment is shown in Table 1.

Table 1. Summary of Rangeland Health Assessments (RHA) for the Squaw Butte Allotment

Standard	2007	2014	Comments
1. **Watershed Function – Uplands** Upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate, and landform	Met	Met	The 2007 RHA stated that soils within the Squaw Butte Allotment exhibited infiltration and permeability rates, moisture storage, and stability were appropriate for soil, climate, and land form. Root occupancy for the soil was appropriate. Based on 1997-2001 ESI data, the soil surface factor (SSF) rating showed 72% of the allotment was in slight, 11% in moderate, and 17% in unknown classes (Table 2). There is little or no active soil erosion or evidence of past erosion in the area. In 2014, a summary of the vegetation trend plots indicated the vegetation cover was stable and there was still little or no active soil erosion.
2. **Watershed Function -Riparian/ Wetland Areas** Riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform.	Met	Met	There are no perennial or major intermittent streams nor associated riparian areas in these allotments, so this standard does not apply.
3. **Ecological Processes** 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	Met	Met	In 2007, a review of the range monitoring data (photos, trend transects, climate, field observations) ESI data, wildlife inventories, botany reports, weed surveys, and professional judgment indicated that overall the assessment area was meeting this standard. Indicators used to evaluate this standard included animal populations, vegetative composition, presence of weed species, botanical reports, ecological status, OAT, current plant composition as compared to a defined Potential Natural Community (PNC) for the soil type and precipitation zone. SSF, OAT, Range Site, Seral Stage and PNC are from the Lake County ESI survey (1997-2001). The ESI survey compared the current plant composition to a defined PNC. The ESI survey determined that 11% of the native plant communities were in PNC, 51% were in Late Seral, 21% were in Mid Seral, and 0% were in Early Seral (see Table 3). Table 3 presents the summary of ESI data which shows the diversity of plant communities and indicators used to evaluate this standard. Observed Apparent Trend (OAT) is a one-time trend for the area determined in the 1997-2001 ESI survey. Totals for the acreage surveyed in the Squaw Butte Allotment showed 19% had an upward trend, 62% had a static trend and 0% had a downward trend.

			In the 2007 RHA, an ID team made the following observations about the current plant communities: Health, productivity and diversity of plant species were good throughout the assessment area. Small areas had inhibited productivity and diversity in which livestock grazing is not contributing towards these areas not meeting the standard. Long-term trend studies show substantial juniper expansion into sagebrush steppe communities in the allotment which, left untreated is expected to reduce the plant diversity and overall health of perennial grasses, forbs and shrubs in the area within the next 10-20 years. There are 3 trend photo plots scattered around the allotment which began in the 1960s or 1970s and continue today. In 2014, an analysis of the 3 photo trend plots in the allotment found the same observations made in 2007 still apply (Table 2). These photos illustrated the plant communities are either stable or improving across the allotment. The vigor, condition, and composition of the vegetation in the photos were influenced by the amount of moisture, the grazing schedule, and wildfire. But even taking into account these factors, the ecological condition of these sites has either remained stable or improved over the last 30 years, except that there has been an increase in juniper density and size across the allotment. In Tables 4-6 is a summary of the vegetation transects on the three trend plots (SB-01, SB-02 and SB-03). The vegetation data was collected three years between 1987 and 2012. The same species appear to be present and the three trend sites appear to have a static to upward trend. Currently there are no known noxious weeds located within the allotment. Surveys were completed in 2014. There are no known noxious weeds near this allotment currently. The most likely species to invade this area would be spotted knapweed due to the large populations of it on the Prineville district and Deschutes National Forest, which are located near the allotment. The allotment will continue to be monitored for noxious weeds and non-native invasive plant species. This standard is currently being met from the aspect of natural wildlife populations, diversity, and sustainability with current environmental conditions. The majority of habitats within the allotment are in functional condition and support natural ecological processes. Habitat quality and population levels fluctuate over time, and generally represent natural trends in the ecosystem; however, some species may show erratic or negative trends. These trends are determined through monitoring of habitat and animal composition and community structure. In 2004 and in 2013 the allotment is supporting the current and proposed number of mule deer and pronghorn antelope identified by ODFW big game management plans**.** This area supports diverse wildlife populations that are appropriate for the types of habitats available within the allotment.
4. **Water Quality** Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards	Met	Met	No surface water or groundwater within the allotment has been listed for exceeding State Water Quality standards.
5. **Native, Threatened & Endangered, and Locally Important Species** Habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local	Met	Met	The 2007 RHA found the allotment contained healthy, productive, and diverse plant and animal populations and communities that were appropriate to soil, climate, and landform. No Special Status Plant Species located within the allotment. This standard is being met for healthy, productive and diverse populations of plant communities. There are no listed T&E or sensitive aquatic species known in the area. Special status wildlife species or their habitats that may be present within the allotment include the Bald Eagle *(Haliaeetus leucocephalus), F*erruginous Hawk *(Buteo regalis),*Peregrine Falcon *(Falco peregrinus),* Burrowing Owl *(Speotyto cunicularia*i, Townsend's big-eared bat *(Corynorhinus townsendii),* Greater Sage-Grouse *iCentrocercus urophasianus),* and pygmy rabbit *Brachylagus idahoensis).* No nesting habitat is available within the allotment for Bald Eagles. It is suspected that Bald Eagles are occasional visitors to the area. Bald Eagle foraging does occur within the allotment. No nesting habitat is available for Peregrine Falcons. No incidental sightings of peregrines exist within the allotment. There is some potential nesting habitat for Ferruginous Hawks on scattered junipers within the allotment and sightings have occurred in the area. No

importance) appropriate to soil, climate, and landform			surveys have been conducted for Ferruginous Hawk. Ferruginous Hawk foraging habitat exists through portions of the allotment. There are no resource issues for Peregrine Falcons, Ferruginous Hawks, or Bald Eagles. No observations of Burrowing Owls exist within the vicinity of the allotment. It is assumed that they may occasionally occur within the allotment. There are no known resource conflicts for this species. There are no known roost sites within the allotment for Townsend's big-eared bats, but probably occur in or adjacent to the allotment. It is suspected that Townsend's forage across portions of the allotment. There are no known resource conflicts for this species. Habitat is present for pygmy rabbit, but no known locations exist within the allotment for these species. No inventories have been conducted for this species within the allotment. The nearest known populations of pygmy rabbits are over 15 miles to the south. It is suspected that pygmy rabbits could occur within portions of the allotment. There are no known resource conflicts for this species. There are also four species with high public interest: mule deer *(Odocoileus hemionus),* elk, *(Cervus elaphus),* California bighorn sheep *(Ovis canadensis)* and pronghorn antelope *(Antilocapra americana).* In 2004 and 2013 the allotment is supporting the current and proposed number of mule deer and pronghorn antelope identified by ODFW big game management plans**.** There is some overlap in range between bighorn sheep and cattle, however bighorn sheep use is light at this time and on the fringes of the lava flows in the area. Some impacts to bighorn sheep from expanding stands of young western juniper are expected within the next 10-20 years. Bighorn sheep would benefit from the removal of western juniper. No major conflicts exist between bighorn sheep and cattle grazing within the allotment. Moderate to high concentrations of wintering mule deer occur in the allotment. Wintering deer depend on bitterbrush and big sagebrush as winter forage. Both of these browse species are common within the allotment. There is no evidence showing impacts from grazing on mule deer foraging and winter range. Elk occur year round throughout portions of the allotment and on adjacent public and private lands. Historically elk were absent from the surrounding area. They have only increased in density over the last 15 -20 years. Some potential forage conflicts exist between livestock and elk. These conflicts are minimal however. Elk use on the adjacent private lands is most common during the alfalfa growing season and use on public land increases during fall and winter. Elk numbers within the allotment fluctuate greatly over the year and between years. No major conflicts exist between elk and livestock at this time There are no Greater Sage-Grouse lek sites within the allotment; however, BLM identified preliminary general and ODFW low density habitat does occur within the allotment. The nearest active lek sites are approximately 10 miles to the east and 9 miles to the west. No known issues exist between livestock grazing and sage-grouse use within this allotment. Current limiting factors and threats to sage-grouse habitat in the allotment are mostly from western juniper expansion in the south and western portions of the allotment. At this time, western juniper has not greatly altered sagebrush habitats, however, small juniper are established across much of the allotment and will greatly reduce habitats for sage-grouse and other sagebrush obligates over the next 20 years if left unchecked. Sage-grouse habitat would greatly benefit from juniper removal.

2014 Team Members

Name	Title
Les Boothe	Rangeland Management Specialist
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Jimmy Leal	Fisheries Biologist
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Guidelines for Livestock Management

Existing grazing management practices and levels of grazing use on the Squaw Butte Allotment are consistent with the Guidelines for Livestock Grazing Management (August 12, 1997). The pastures in the allotment continue to be grazed under a rest rotation grazing system, and are provided growing season rest every other year and year-long rest every third year. The grazing season and year-long rest enables the grass species to provide adequate cover for infiltration, moisture storage and maintain diverse plants communities.

2014 Determination

(X) Existing grazing management practices on the Squaw Butte Allotment promote achievement of, or significant progress towards, meeting the Oregon Standards for Rangeland Health and conform with the applicable Guidelines for Livestock Grazing Management.

( ) Existing grazing management practices on the Squaw Butte Allotment will require modification or change prior to the next grazing season to promote achievement of the Oregon Standards for Rangeland Health and conform with the applicable Guidelines for Livestock Grazing Management.

J. Todd Forbes, Field Manager — Date 9/29/14

Squaw Butte Allotment Monitoring Summary (2014)

In 2014, two pastures (Lava and South) in Squaw Butte Allotment will be utilized from May 1 to October 15 and Rogers pasture was rested. The Squaw Butte Allotment has 1,000 active AUMs. The average actual use from 2003-2013 is AUMs and target utilization level is 50%.

Table 1. Actual Use and Utilization in Squaw Butte Allotment

Year	Lava Pasture		Rogers Pasture		West Pasture	
	AUMs	% Utilization	AUMS	% Utilization	AUMS	% Utilization
2013	415		380		REST	
2012	REST		391	52%	354	51%
2011	354		REST		410	
2010	374		364		REST	
2009	REST		378		310	
2008	290		REST		471	
2007	363		295		REST	
2006	REST		478		406	
2005	328	35%	REST		411	34%
Total	**2124**		**2286**		**2362**	
Ave.*	**354**		**381**		**394**	

* The average AUMs number was only for the years the pasture was grazed and does not include the rest years.

Utilization in the allotment exceeded the target utilization rate of 50% in 2012 in the Lava Pasture (52%) and in the West Pasture (51%). The precipitation during the preceding growing season (Oct-Sept) was only 57% of normal. This dry year would result in significantly lower forage production and explain the higher utilization levels in 2012.

The total active AUMs (average 752) did not exceed the permitted active AUMS (1,000 AUMS) for the three pastures. The highest AUM use was 884 in 2006.

There are 3 permanent, long-term photo trend plots in the Squaw Butte Allotment with each containing a vegetation transect (Table 2). The vegetation transect at trend plot SB-01 was a sagebrush/fescue community before burning in 1986. The vegetation transect was examined in 1992 and 2012 and showed an increase in perennial grass cover as the sagebrush has not returned to pre-burn levels. The rabbitbrush basal and canopy cover and frequency have all increased significantly since 1986 (Table 2).

Overall, the trend is stable to improving as the community has substantial perennial grass and is responding to the 1986 fire in a predictable manner. Initially the perennial grass plants benefited followed by the invasion of rabbitbrush and now the sagebrush is beginning to return to the site.
The SB-02 vegetation transect and photos show a stable trend in perennial grass cover and frequency but a slow increase in the cover and frequency of juniper at the site. There was a noticeable decrease in sagebrush frequency from 1981 and 1994 to 2012 (Table 5). This might be the result of the increase in juniper size and density. The SB-03 vegetation transect and photos seem to indicate an upward trend as the cover and frequency of the perennial grass species has increased between 1987 and 2012 (Table 6).

Table 2. Ecological Trend by Pasture Based on Long-term Monitoring Photos and Plots

Pasture	Monitoring plot#	Photo Trend Years Taken	Transect Method Years	Trend
Rogers	SB-01	Photo 11 Years 1967-2012	Nested Frequency & Canopy Cover Read in 1981, 1992, and 2012	The Photo Trend was Stable 1975-1986. Burned in 1986. Trend was Upward in 1986 as grass increased until rabbitbrush began to occupy the site. In 2012, there was increased shrub cover and trend appears stable. Analyzing the trend transects, vegetation cover increased following the burn in 1986. By 2012, the shrub cover has increased but, was still lower than before 1986 burn. The trend appears stable to upward, as grass species composition has remained stable since 1981.
West	SB--02	Photo 9 Years 1969-2012	Nested Frequency & Canopy Cover Read in 1981, 1994 and 2012	The photo trend was stable from 1969 thru 1994. In 2012, the photos show noticeable increase in the size and density of juniper and possible decrease in the size and density of sagebrush. The grass cover has appeared stable since 1969. Analyzing the trend transects, vegetation cover has increased since in 1987. However, the frequency of juniper has also increased and the frequency of sagebrush has declined since 1987.
Lava	SB-03	Photo 3 Years 1987,1992 and 2012	Nested Frequency & Canopy Cover Read in 1987, 1992 and 2012	Static in photo tend overall, but there was a noticeable increase in the size of juniper trees and a slight reduction in the density of sagebrush. Perennial grass appears to have increased. The vegetation transects appeared stable from 1987- 2012 with no reduction in sagebrush cover or frequency. There may be an increase in perennial grass and frequency.

Table 3. Summary of ESI Data Squaw Butte Allotment Data Collected 1998-2001

Vegetation Community	Total Acres	% of Veg Comp	Soil Surface Factor (SSF) Acres			Obeserved Apparent Trend (OAT) Acres		Acres of Vegetative Community in Seral Stage			
			Stable	Slight	Moderate	Static	Up	PNC	Late	Mid	
ARAR/FEID Low sagebrush/Idaho fescue	49	1%		44	5	49			49		
ARTRV/FEID mountain Big sagebrush/Idaho fescue	3787	44%		3787		3787		740	1,715	1332	
ARTRV/PSSPS mountain Big sagebrush/bluebunch wheatgrass	154	2%		154		154				154	
Total Mountain big sagebrush	**3941**	**46%**	**0**	**3941**	**0**	**3941**	**0**	**740**	**1715**	**1486**	
PUTR/FEID antelope bitterbrush/ Idaho fescue	134	2%		134		134				134	
CHVIS2/FEID Green rabbitbrush/Idaho fescue	289	3%			289	289			289		
JUOC/ARTRV/FEID Western juniper/mountain big sagebrush/Idaho fescue	1802	21%		1222	580	587	1215	133	1669		
JUOC/ARTRV/PSSPS Western juniper/mountain big sagebrush/bluebunch wheatgrass	272	3%		272		207	65		111	161	
JUOC/ARAR/FEID Western juniper/low sagebrush/Idaho fescue	63	1%		63			63		63		
Total Western juniper	**2137**	**25%**	**0**	**1557**	**580**	**794**	**1341**	**133**	**1843**	**161**	
PIPO/ARPA6/FEID Ponderosa pine/Greenleaf Manzanita/Idaho fescue	161	2%		161			161			161	
PIPO/ARTRV/FEID Ponderosa pine/mountain big sagebrush/Idaho fescue	232	3%	146	86		86	146		198	34	
Total ponderosa pine	**393**	**5%**	**146**	**247**	0	**86**	**307**	0	**198**	**195**	
Total Mapped Vegetation	**6943**	**81%**	**146**	**5923**	**874**	**5293**	**1650**	**873**	**4094**	**1976**	
Percent of Allotment			2%	69%	10%	62%	19%	10%	48%	23%	
Unknown, transition zones, rock outcrops	1606	19%									
Total	8549										

Table 4. Squaw Butte Trend Monitoring Summary (Rogers Pasture SB-01; SB-01 burned in 1986**)**

YEAR	1981*	1992**	2012***
	Percent Ground Cover		
Bareground	61%	66%**	33%
Litter	34%	6%	34%
Rock	0	T	1
Vegetation	5%	28%	31%
Species	**Ground Cover by Species**		
SIHY	0.6%	N/A	1%
STTH	0.4%	N/A	N/A
ARTR	0	N/A	1%
FEID	2.4%	N/A	N/A
STTH/FEID***	N/A	N/A	21%
CAREX	0.8%	N/A	1%
POSA	0.4%	N/A	0
CHNA	0	N/A	0
CHVI	0	N/A	7%
	Canopy Cover by Species		
CHNA	0.2%	N/A	
CHVI	0.4%	N/A	11%
ARTR	5.8%	N/A	2%
FEID	5.2%	N/A	N/A
CAREX	4.8%	N/A	N/A
STTH	0.4%	N/A	N/A
POSA	0.2%	N/A	N/A
SIHY	0.4%	N/A	N/A
TOTAL CANOPY	**17.4%**	N/A	13%
Species	**Frequency by Species**		
STTH	10%	27%	N/A
ARTRW	26%	0%	3%
SIHY	14%	9%	9%
FEID	56%	33%	N/A
STTH/FEID	N/A	N/A	68%
POSA	5%	1%	1%
CAREX	14%	16%	9%
AAFF		%	6%
CHVI	21%	20%	28%
CHNA	7%	2%	
FORBS	**	33%	

* In 1981, the methodology used to estimate basal and cover canopy included grass and grasslike plants providing canopy cover as well as basal cover. Therefore when comparing plant cover in 1981 with plants cover in 2012 the canopy and the basla cover in 1981 should be added together.

** In 1992, the cover data was not collected by species as electronic data recorders were used.

*** In 2012, it appears that Idaho fescue (FEID) was identified as Thurbers Needlegrass (STTH). So they are lumped together in the summary. In addition the canopy cover in 2012 was only estimated for shrub species using the line intercept method.

Table 5. Squaw Butte Allotment Nested Frequency Summary (SB-02 West Pasture)

YEAR	1981	1994*	2012**
BAREGROUND	59%	45%	28%
ROCK	1%	0	1%
LITTER	37%	11%	39%
VEGETATION	3%	45%	32%
SPECIES	**PERCENT COVER BY SPECIES**		
SIHY	0.4%	N/A	1%
CARO	0.4%	N/A	0
POSE	0	0	4%
AGSP	0	N/A	0
AAFF	0	N/A	1%
FEID	1%	N/A	10%
BRTE	0.2%	N/A	0
ARTR	0.6%	N/A	12%
JUOC	0	0	1%
POPI	0	0	2%
	CANOPY COVER BY SPECIES		
ARTR	12%	N/A	19%
PUTR	0	N/A	3%
CHRyS	0	N/A	3%
CAREX	2%	N/A	N/A
FEID	2%%	N/A	N/A
SIHY	0.6%	N/A	N/A
AGSP	0.2%	N/A	N/A
BRTE	0.2%	N/A	N/A
SPECIES	**FREQUENCY BY SPECIES**		
SIHY	12%	24%	4%
POSE	10%	18%	24%
FEID	36%	69%	52%
AGSP	2%	5%	0
CHVI/CHNA	12%	11%	0
BRTE	15%	7%	2%
PUTR	3%	0	0
ARTR	50%	23%	18%
JUOC	0	0	4%

*In 1981, the methodology used to estimate basal and cover canopy included grass and grasslike plants providing canopy cover as well as basal cover. Therefore when comparing plant cover in 1981 with plants cover in 2012 the canopy and the basal cover in 1981 should be added together.
**In 1994, the cover data was not collected by species as electronic data recorders were used.
** *In addition the canopy cover in 2012 was only estimated for shrub species using the line intercept method.

Table 6. Squaw Butte Allotment Nested Frequency Summary (SB-03 Lava Pasture)

YEAR	1987	1992*	2012**
BAREGROUND	47%	52%	31%
ROCK	0	0	0
LITTER	42%	36%	20%
VEGETATION	11%	12%	48%
SPECIES	**PERCENT COVER BY SPECIES**		
SIHY	1%	N/A	1%
STTH	1%	N/A	2%
AGSP	T	N/A	0
FEID	9%	N/A	30%
ARTR	0	N/A	12%
CHRYS	0	N/A	2%
LUPINE	0	N/A	1%
	CANOPY COVER BY SPECIES		
ARTR	15%	N/A	16%
CHRYS	3%	N/A	5%
SPECIES	**FREQUENCY BY SPECIES**		
SIHY	33%	56%	22%
POSE	0	0	0
STTH	28%	45%	52%
FEID	63%	96%	93%
CHVI		23%	28%
CAREX			4%
TECA			3%
ARTR		34%	47%

*In 1992, the cover data was not collected by species as electronic data recorders were used.

** In addition, the canopy cover in 2012 was only estimated for shrub species using the line intercept method.