

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

Update for
Lane Plan 2 Allotment (#00206)

April 2019

Background

The Lane Plan 2 Allotment (#00206) is located approximately 20 miles east of Lakeview, Oregon (see map 1) north of Hwy 140. The allotment, totaling 12,473 acres¹ with one permittee, contains four pastures: Crump Reservoir (6,846 acres), Highway (87 acres), Parsnip Seeding (1,355 acres), and Thompson Lake (3,299 acres). The Highway pasture has the same management schedule as the Parsnip Seeding pasture; the two pastures are used in conjunction. The Bureau of Land Management (BLM) manages 10,060 acres, while Oregon State manages 202 acres; the remaining 2,211 acres is managed under private ownership. There are 884 acres within five exclosures: Drake Creek (547 acres), Upper Drake Creek (163 acres), Upper Parsnip Creek (22 acres), Thompson Cabin (147 acres), and Thompson Cabin Reservoir (5 acres). Both the Drake and Parsnip Creek's exclosures were built to minimize the effect of livestock grazing on Warner sucker (*Catostomus warnerensis*) habitat downstream of the allotment.

There are 450 Animal Unit Month's (AUM) authorized for cattle forage between April 1st through July 10th. The Lane Plan 2 Allotment has been grazed under a rest-rotation system, which has been in place since 1971; with the exception of the Parsnip Seeding pasture which has only received rest once (2010) since 1996. The Parsnip Seeding pasture has limited use, with a 20 year average of 62 AUM's, which accounts for the reason it is rarely rested. Water for livestock is limited to reservoirs, springs, and waterholes, which can be dry during years of low precipitation.

There are 13 long term photo trend plots on the allotment with 4 plots in Crump Reservoir pasture, 1 plot in Highway pasture, 5 plots in Parsnip Seeding pasture, and 3 plots in Thompson Lake pasture. Plot LP2-01, which was believed to be in the Parsnip Seeding pasture, actually occurs on private land; therefore, it has not been included in the assessment update. Plot PS-450, in the Highway pasture, was lost in 2002 during Hwy 140's realignment. Five of the trend plots have additional monitoring, which may include a combination of Line-Point-Intercept (LPI), Observed Apparent Trend (OAT), and/or Step-toe transects. Eight of the trend plots are photo plots only. Additionally, four Assessment, Inventory, and Monitoring (AIM) plots with photos, soil, and vegetation data were randomly collected in the Crump Reservoir pasture.

A Lane Plan 2 Allotment Rangeland Health Assessment (RHA) was originally completed in 1999. Standards 1, 3, and 5 were met, while standards 2 and 4 were not met. This assessment is an update to the original RHA. Presented in Table 1 is a summary of both the original 1999 and updated assessments.

The same Ecological Site Inventory (ESI) data was used in both RHA's; however, since the ESI data was first collected, the data has had refinements which were finalized in 2005 for the Lakeview District. Therefore, the ESI data between the previous RHA and the current RHA differ slightly.

Table 1. Summary of Rangeland Health Assessments for the Lane Plan 2 Allotment (#00206)

Standard	2018 Assessment	Comments 2018	1999 Assessment	Comments 1999
1. Watershed Functional – Uplands	Met	Currently, this standard is being met. The Lane Plan 2 Allotment primarily has either stable or upward trends, as indicated by monitoring plots (see map 2) consisting of photographs and vegetation transect data (Appendix A – Monitoring Summaries). Based on all plot data available, there is adequate vegetation cover, litter, and community structure to facilitate infiltration, moisture storage, and soil stability appropriate for the soils found on the Lane Plan 2 Allotment in conjunction with the climate regime for this region.	Met	Majority of soil (99%) is rated as having stable to slight erosion potential and having a stable to upward ecological trend. Vegetation community and range condition data were consistent with plant composition for the identified soils and climate.
2. Watershed Function – Riparian/ Wetland Areas	Met	Drake Creek and Parsnip Creek within the allotment are excluded from grazing with the exception of small stock water gaps. Parsnip Creek was rated as PFC in 2016. Drake Creek was not rated, but is trending upward in condition, and is thought to be at PFC based on field reconnaissance and photo point analysis.	Not Met	One reach on Drake Creek was rated as not having Proper Functioning Condition (PFC). Management practices were changed, resulting in progress towards meeting the standard. Current livestock management is not a significant factor in not meeting the standard.
3. Ecological Processes	Met	Currently, the standard is being met for vegetation. Photograph and transect monitoring data show vegetation community and structure appears to align with the ESI data on the allotment. Overall, there is adequate vegetation cover, litter, and community structure to facilitate infiltration, moisture storage, and soil stability appropriate for the soils found on the Lane Plan 2 Allotment in conjunction with the climate regime for this region. 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 typically found within sagebrush-steppe communities in the northern Great Basin. The nonnative invasive annual grasses, cheatgrass, field brome, and soft brome are found throughout the allotment and lie	Met	The allotment is managed under a rest-rotation grazing system maintaining plant health and current vegetative communities appropriate to these soils and climate. Current grazing management is maintaining sufficient vegetation cover and litter for nutrient cycling.

		<p>within an estimated 1,870 acres (15%) of the allotment.</p> <p>Currently, these invasive annual grasses and forbs are not outcompeting native vegetation across large areas, but are confined to small patches.</p> <p>However, if not managed and allowed to keep spreading, potential problems will arise as native vegetation is lost.</p>		
4. Water Quality	Not Met	Both Drake and Parsnip Creeks, from the mouth to the headwaters, do not meet state temperature standards. Livestock management is not considered to be a factor in not meeting the standard as both Drake and Parsnip creeks are enclosed.	Not Met	Both Drake and Parsnip Creeks, from the mouth to the headwaters, do not meet state temperature standards. Livestock management is not considered to be a significant factor in not meeting the standard.
5. Native, T/E, And Locally Important Species	Met	<p>Drake and Parsnip Creeks flow into occupied Warner sucker habitat, which is a Threatened Species under the Endangered Species Act (ESA), however no occupied habitat exists within the allotment. Warner Redband Trout, a Bureau Sensitive Species, is found in both streams and appear to have strong populations.</p> <p>There are currently no special status plants located in Lane Plan 2 allotment. In the 1999 RHA one special status plant, Dwarf lousewort (<i>Pedicularis centranthera</i>) was present but it is no longer considered a Special Status/Sensitive species.</p> <p>This update includes the Multi-Scale Suitability ratings for Greater Sage-Grouse. The Lakeview IDT determined 88% ($\pm 13.5\%$) of breeding and 100% of winter seasonal habitat within the allotment was suitable; similar proportions were found within the Fine-Scale area. Thus, availability of suitable seasonal habitat is appropriate for the Greater Sage-Grouse-see Standard 5 discussion.</p>	Met	The diversity of plant and wildlife species is consistent with productive sagebrush steppe communities. One special status plant, Dwarf lousewort (<i>Pedicularis centranthera</i>) is present in the area. Drake and Parsnip Creeks flow into occupied Warner sucker habitat, which is a Threatened Species under the Endangered Species Act (ESA), however no occupied habitat exists within the allotment. Warner red-band trout, a Bureau Sensitive Species, is found in both streams and appear to have a strong population.

Standard 1. Watershed Function-Uplands: Upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate, and landform.

This standard was met in 1999. The previous RHA, which used Ecological Site Inventory (ESI) transects indicating 4,282 acres (34%) had an upward trend and 8,094 acres (65%) were static. The remaining 97 acres (1%) were unknown. Unknown classifications are due to vegetation communities within transition areas which were too small to be mapped separately. Additionally, in 1999 Soil Surface Factor (SSF) ratings were used to indicate soil erosion potential. The allotment had 11,454 acres (92%) rated as stable and 922 acres (7%) rated as having a slight erosion potential. As with the ESI rating, 91 acres (1%) were unknown.

Currently, this standard is being met. The Lane Plan 2 Allotment primarily has either stable or upward trends, as indicated by monitoring plots (see map 2) consisting of photographs and vegetation transect data (Appendix A – Monitoring Summaries). Plot LP2-02 and plot SFA-GRSG-061 have transect data showing these plots have invasive brome species infestations, such as cheatgrass (*Bromus tectorum*), field brome, also known as Japanese brome, (*Bromus arvensis*), and soft brome (*Bromus hordeaceus*); especially at plot SFA-GRSG-061 where invasive brome species have the highest cover of any grass species. Plot PS-439 B, a photo plot, shows an increase in the cover of low sagebrush since the 1970's. These three plots illustrate areas where the vegetation composition is not matching with the potential natural community, but ground cover of perennial grasses and shrubs combined with annual grass cover is more than sufficient to protect soil from erosion. Overall in the allotment, the vegetation community is stable with upward trends occurring at plot PS-451, plot PS-499A (which had a small amount of juniper thinning), and plot PS-450 (before the Hwy 140 realignment in 2002), since the last RHA in 1999. Photographs from the remaining nine trend plots indicate these plots are stable. In addition to the trend plots, there are AIM plots with baseline data which can be grouped by dominant vegetation communities.

All the plots lie within 5 dominant ESI Geographic Information System (GIS) polygons² (polygons are derived from ESI transect data) vegetation and soil communities (see maps 3&4) in the allotment (Table 2a-d): crested wheatgrass (*Agropyron cristatum*) at 519 acres (4%), low sagebrush (*Artemisia arbuscula*)-Sandberg bluegrass (*Poa secunda*) at 5,271 acres (42%), mountain big sagebrush (*Artemisia tridentata*)-bluebunch wheatgrass at 671 acres (5%), western juniper (*Juniperus occidentalis*)-low sagebrush-Idaho fescue at 275 acres (2%), western juniper-mountain big sagebrush-Thurber's needlegrass (*Achnatherum thurberianum*) at 619 acres (5%); totaling 7,355 acres (59%). The remaining ESI polygons with no plot data accounts for 5,118 acres (41%), primarily composed of low sagebrush, big sagebrush, and western juniper communities; of which, 1,713 acres (14%) was classified as "unknown/incomplete" due to vegetation communities within transition areas which were too small to be mapped separately.

Current SSF ratings (Table 2b) for the allotment show 7,997 acres (64%) were classified as being stable, 2,758 acres (22%) as having slight erosion potential, and the remaining 1,718 acres (14%) were unknown. Ratings for OAT (Table 2c) indicated 5,746 acres (46%) were trending upward, with a static rating for 5,040 acres (40%) and the remaining 1,718 acres (14%) are unknown. Based on all plot data available, there is adequate vegetation cover, litter, and community structure to facilitate infiltration, moisture storage, and soil stability appropriate for the soils found on the Lane Plan 2 Allotment in conjunction with the climate regime for this region.

Crested wheatgrass dominant vegetation communities

Within the crested wheatgrass ESI polygon is one photo trend plot (PS-450) indicating the site was stable, before this plot was eliminated due to the restructuring of Hwy 140. Both shrubs and grasses appear vigorous during the years the plot was recorded. Foliar and ground cover, as seen in the photographs, appears consistent with the crested wheatgrass ESI data.

Low sagebrush-Sandberg bluegrass dominant vegetation communities

The low sagebrush-Sandberg bluegrass ESI polygons contain 10 plots. Seven of the plots (PS-438, PS-439 A, PS-439 B, PS-439 C, PS-451, PS-454, and PS-499 A) are photo trend only; overall, foliar and ground cover appears consistent with the low sagebrush-Sandberg bluegrass ESI data. Plot PS-439 B photographs illustrate an increase in low sagebrush overtime. However, plots PS-439 A and PS-439 C are in the same location as plot PS-439 B, but oriented in different directions, and both are in stable condition, as indicated by photographs and transect data. Plot PS-438, PS-439 C, PS-451, PS-454, and PS-499 B photographs indicate stable trends throughout plot period; with grass and shrub vigor remaining stable during the course of observation. Photographs from plot PS-499 A shows an upward trend, after some juniper thinning in 1998.

Plots LP2-02, LP2-500, and PS-439 A have photo trends and baseline data, which includes step-toe transects, LPI shrub cover, and OAT data. Photographs for plots PS-439 A and LP2-500 indicate stable trends during the period the plot was observed. Foliar, ground, and litter cover are similar for plots LP2-02 (Table 3), LP2-500 (Table 7), and PS-439 A (Table 10). Plot PS-439 A had 7% moss/lichen/soil crusts, while the other two plots had no moss, lichen, or soil crusts. All three plots appear consistent with the low sagebrush-Sandberg bluegrass ESI data.

Plot LP2-02 also had an OAT rating taken in 2000 (Table 6). In 2000 the plot was rated as having an upward trend due to good vegetation vigor, a high number of seedlings of desirable species, high litter, and little evidence of pedestaling or gully development.

There are two AIM plots, LA-INTS-017 and SFA-GRSG-061, in the low sagebrush-Sandberg bluegrass ESI polygons. Foliar, ground, and litter cover appear consistent with the low sagebrush-brome species ESI data. Baseline data for LA-INTS-017 (Table 13) and SFA-GRSG-061 (Table 16) indicate both have similar cover data; with plot SFA-GRSG-061 have slightly higher foliar cover due to a greater amount of perennial forbs and brome species. In addition to foliar and ground cover measurements, AIM plots measure soil stability. Plot LA-INTS-017 (Table 15) had a soil stability rating of 3.1, while SFA-GRSG-061 (Table 18) had a rating of 2.7; both ratings indicating a higher potential for soil erosion due to soils with high clay and low organic content.

Plot SFA-GRSG-061 also includes Rangeland Health Indicators (RHI) (Table 19), which rated the plot as having slight-moderate deviations from ideal conditions, at the plot site, for "Soil Stability"; while both "Hydrologic Function" and "Biotic Integrity" had a deviation rating of none-slight. While these RHI ratings indicate deviations from reference conditions in terms of soil stability, they are not indications that the site is in a downward trend. The RHI indicators when compared to the SSF ratings (Table 2b)

from the ESI data show both RHI and SSF indicate soil stability has a stable to slight potential for soil erosion which contrasts with the soil stability test mentioned earlier. Another factor to consider for plot SFA-GRSG-061 is that even though brome species are prevalent in this area, more data is needed to determine whether these annual grasses are affecting the soil stability and hydrologic function of the site or whether these site conditions are natural for this soil composition and region.

Mountain big sagebrush-bluebunch wheatgrass dominant vegetation community

There are two AIM plots, LA-INTS-013 and SFA-FO-OTH-005, in the low sagebrush-Sandberg bluegrass ESI polygons. Foliar, ground, and litter cover appear consistent with the low sagebrush-Sandberg bluegrass ESI data. Baseline data for LA-INTS-013 (Table 20) and SFA-FO-OTH-005 (Table 23) indicate both have different cover data. The primary difference is plot LA-INTS-013 has nearly 20% higher foliar cover due to a greater amount of shrub and tree cover, resulting in less litter and bare ground between foliar cover. In addition to foliar and ground cover measurements, AIM plots measure soil stability. Plot LA-INTS-013 (Table 22) had a soil stability rating of 3.0, while SFA-FO-OTH-005 (Table 25) had a rating of 3.1; both ratings indicating a higher potential for soil erosion due to soils with high clay and low organic content.

Plot SFA-FO-OTH-005 also includes Rangeland Health Indicators (RHI) (Table 26), which rated the plot as having slight-moderate deviations from ideal conditions, at the plot site, for both "Soil Stability" and "Hydrologic Function"; "Biotic Integrity" had a deviation rating of none-slight. While these RHI ratings indicate deviations from reference conditions in terms of soil stability and hydrologic function, they are not indications that the site is in a downward trend. The RHI indicators, rills, water flow patterns and pedestals have moderate deviations from the reference community and this appears to be the result of juniper invasion and the conversion of a site from big sagebrush dominated to juniper dominated. The SSF ratings (Table 2b) from the ESI data collected in 1988 found soil stability was stable for this site. Therefore as site has changed because of juniper the reference community (Mountain big sagebrush-bluebunch wheatgrass) used for plot SFA-FO-OTH-005 no longer represents the current site. The presence of rills on the slopes and the soil movement observed at the site are representative of the natural stability and hydrologic function for the current vegetation composition at this site.

Western juniper-low sagebrush-Idaho fescue dominant vegetation community

The western juniper-low sagebrush-Idaho fescue ESI polygon has one photo trend plot (LP2-03A) indicating the site was stable. Both shrubs and grasses appear vigorous during the years the plot was recorded. Foliar and ground cover, as seen in the photographs, appears consistent with the western juniper-low sagebrush-Idaho fescue ESI data.

Plot LP2-03A also had an OAT rating taken in 2000 (Table 27). In 2000 the plot was rated as having an upward trend due to high vegetation vigor, a high number of seedlings of desirable species, good litter, and little evidence of pedestaling or gully development.

Western juniper-mountain big sagebrush-Thurber's needlegrass dominant vegetation community

The western juniper-mountain big sagebrush-Thurber's needlegrass ESI polygon has one plot (LP2-03B) having photo trends and baseline data, which includes step-toe transects, LPI shrub cover, and OAT data. Photographs for plot LP2-03B indicate stable trends during the period the plot was observed, both shrubs and grasses appear vigorous. Foliar, ground, and litter cover (Table 28) appears consistent with the western juniper-mountain big sagebrush-Thurber's needlegrass ESI data.

Plot LP2-03b also had an OAT rating taken in 2000 (Table 31). In 2000 the plot was rated as having a stable trend due to moderate vigor, a sufficient number of seedlings of desirable species, good litter, and little evidence of pedestaling or gully development.

Standard 2. Watershed Function-Riparian/Wetland: Areas are in properly functioning physical condition appropriate to soil, climate, and landform.

In the 1999 RHA, this standard was not met due to non-proper functioning condition (PFC) on one reach on Drake Creek. Non-PFC was a result of past grazing practices and natural conditions. Management practices were changed, resulting in progress towards meeting the standard. Livestock management in 1999 was not a significant factor in the standard not being met.

Drake Creek and Parsnip Creek within the allotment are excluded from grazing with the exception of small stock water gaps. Parsnip Creek was rated as PFC in 2016. Drake Creek was not rated, but is trending upward in condition, and is thought to be at PFC based on field reconnaissance and photo point analysis.

Standard 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 hydrologic cycle.

Wildlife

In the 1999 RHA this standard was met. The allotment provided habitat for terrestrial wildlife species, such as elk, mule deer, pronghorn, and sage grouse. No major competition between wildlife and domestic livestock for forage existed.

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 typically found within sagebrush-steppe communities in the northern Great Basin. 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. The allotment provides adequate habitat for populations of mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), California bighorn sheep (*Ovis canadensis californiana*) and Greater Sage-Grouse (*Centrocercus urophasianus*). Previously there were 146 AUMs allocated for wildlife which has since been updated to 176 AUMs allocated for wildlife. Portions of the allotment lie within ODFW Warner Big Game Management Unit for mule deer, elk, and pronghorn.

Current populations are moving in an upward trend, but still below management objectives. The allotment contains crucial over-wintering habitat for mule deer, pronghorn, and California bighorn sheep.

Vegetation

In the 1999 RHA this standard was met. As noted in Standard 1 above, 85% of the allotment had an SSF rating of slight erosion potential to stable soils (Table 2b), with OAT indicating 85% of the allotment had a static or upward trend (Table 2c). The remaining 14% of the allotment was unknown for both indicators and 1% was rockland. The allotment was managed under a rest-rotation grazing system maintaining plant health and vegetative communities appropriate to those soils and climate. Utilization levels were at or below 45%. Grazing management maintained sufficient vegetation cover and litter for nutrient cycling.

Currently, the standard is being met for vegetation. Ecological Site Index seral stage data (Table 2d), indicated late-seral stage accounted for 1,100 acres (9%), mid-seral stage was 9,651 acres (77%), early-seral stage was 4 acres (< 1%), and 1,718 acres (14%) were unknown. Photograph and transect monitoring data show vegetation community and structure appears to align with the ESI data on the allotment. Overall, there is adequate vegetation cover, litter, and community structure to facilitate ecological processes of nutrient cycling, energy flow, and hydrologic cycle in conjunction with the climate regime for this region.

Crested wheatgrass dominant vegetation community

Photographs from plot PS-450 show the site appears to be at mid-seral stage and in good condition before the Hwy 140 realignment. The crested wheatgrass ESI data designated the polygon to be in a late-seral stage. Ecological Site Description (ESD) data, which provides several states within a vegetation community ranging from State 1 = reference state (desired condition) to State 4 = a site dominated by annuals (poor range conditions), was also used to further illustrate the sites ecological health. Plot PS-450 appears to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained.

Low sagebrush-Sandberg bluegrass dominant vegetation community

Photographs from plots PS-439 A, PS-439 B, and PS-439 C show the sites appear to be at mid-seral stage and in fair condition, which is consistent with the low sagebrush-Sandberg bluegrass ESI data.

Photographs illustrate all three plots are in stable condition, as mentioned earlier in Standard 1. All three plots appear to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained.

Additionally, plot PS-439 A (Table 11) recorded Sandberg bluegrass as the dominant grass followed by Idaho fescue. Low sagebrush is present along with phlox forbs. Additionally, plots PS-439 A (Table 12) has baseline LPI shrub canopy cover data, collected across three 100 ft. transects, in 2012. Plot PS-439 A

had an average of 20% low sagebrush canopy cover. The expected low sagebrush canopy cover in the ESD for this site is 10-20%.

Photographs from plots PS-438, PS-451, and PS-454 show the sites appear to be at mid-seral stage and in fair condition, which is consistent with the low sagebrush-Sandberg bluegrass ESI data. Both plots appear to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained.

Photographs from plots PS-499 A and PS-499 B show the sites appear to be at mid-seral stage and in fair condition, which is consistent with the low sagebrush-Sandberg bluegrass ESI data. Both plots appear to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained.

Photographs from plots LP2-02 and LP2-500 show the sites appear to be at mid-seral stage and in fair condition. Both plots appear to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained. Plots LP2-02 (Table 4) and LP2-500 (Table 8) recorded Sandberg bluegrass as the dominant grass and low sagebrush as the dominant shrub.

Plots LP2-02 (Table 5) and LP2-500 (Table 9) also have baseline LPI shrub and tree canopy cover data, collected across three 100 ft. transects, in 2012. Plot LP2-02 had an average of 14% low sagebrush canopy cover, and less than 1% rabbitbrush (*Chrysothamnus*) species. Plot LP2-500 had an average of 15% sagebrush (*Artemisia*) species canopy cover, with less than 1% antelope bitterbrush (*Purshia tridentata*), 3% yellow rabbitbrush (*Chrysothamnus viscidiflorus*), 2% rubber rabbitbrush (*Ericameria nauseosa*), and 9% western juniper.

Plot LP2-02 and AIM plot SFA-GRSG-061 both have an annual brome populations, accounting for the highest amount of grass cover in plot SFA-GRSG-061 (Table 17). Plots appear to be within State 3 according to the ESD data, where the vegetation community has increased density and cover of invasive brome species. These brome species are annual, shallow rooted grasses, affecting an estimated 105 acres; providing less forage for livestock, reduced vegetation cover and litter production. Both plots LP2-02 and SFA-GRSG-061 are within a 0.25 mile of waterholes and therefore not indicative of the Crump Pasture conditions as a whole; as most of this pasture is stable and maintaining desirable range conditions based on soil types and climate for this region.

The AIM plots, LA-INTS-017 (Table 14) show the site appear to be at mid-seral stage and in fair condition, which is consistent with the low sagebrush-Sandberg bluegrass ESI data. At plot LA-INTS-017, the only grass recorded along the transects was Sandberg bluegrass (11%). Low sagebrush is well represented at 35%. Plot LA-INTS-017 appears to be within State 2 and similar to the reference state with some invasives, while ecological functions have been maintained.

Mountain big sagebrush-bluebunch wheatgrass dominant vegetation community

The AIM plot, LA-INTS-013 (Table 21), shows the site appears to be at late-seral stage and in good condition, which is consistent with the corresponding mountain big sagebrush-bluebunch wheatgrass ESI data. No bluebunch wheatgrass was recorded at this site, while Sandberg bluegrass covered 28% of the plot along with a small amount of purple needlegrass (*Nassella pulchra*) at 2%. Additionally, low sagebrush covered 37% and western juniper 3% of the plot. Plot appears to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained.

The AIM plot, SFA-FO-OTH-005 (Table 24), shows the site to be at mid-seral stage and in fair condition, which is consistent with the corresponding mountain big sagebrush-bluebunch wheatgrass ESI data. The plot appears to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained. Sandberg bluegrass is the dominant grass at 25%, with a small amount of bluebunch wheatgrass (2%) also present. The dominant shrub is antelope bitterbrush at 11%. Mountain big sagebrush may have been misidentified as Wyoming big sagebrush which accounted for 6% of the plot.

Western juniper-low sagebrush-Idaho fescue dominant vegetation community

Photographs from plot LP2-03A shows the site appears to be at late-seral stage and in fair condition, which contrasts with the western juniper-low sagebrush-Idaho fescue ESI data, with the site classified as being at mid-seral stage and in good condition. Plot appears to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained.

Western juniper-mountain big sagebrush-Thurber's needlegrass dominant vegetation community

Photographs from plot LP2-03B shows the site appears to be at mid-seral stage and in fair condition, which is consistent with the western juniper-mountain big sagebrush-Thurber's needlegrass ESI data. Plot appears to be within State 2 according to the ESD data, where the vegetation community is similar to the reference state with some invasives, while ecological functions have been maintained. Plot LP2-03B (Table 30) was dominated by Sandberg bluegrass; followed by squirreltail, with equal amounts of Idaho fescue and Thurber's needlegrass. Both big sagebrush and antelope bitterbrush are well represented.

Plot LP2-03B (Table 31) also has baseline LPI shrub canopy cover data, collected across three 100 ft. transects, in 2012. Plot LP2-03B had an average of 25% low sagebrush canopy cover, 11% antelope bitterbrush, and 3% rabbitbrush species.

Actual use and utilization

Actual use has been collected since 1996, while utilization data has been collected sporadically for approximately 30 years (Table 32). Overall, perennial grasses are in good condition with pasture utilization remaining under the 50% utilization except in the Parsnip Seeding pasture during 1999 and

2002, and in the Thompson Lake pasture during 2007, 2009, and 2015 when utilization measurements were taken. Only during 1997, was the total AUM's of 450 for the allotment exceeded. Crump Reservoir and Thompson Lake pastures receive rest every other year, except during 2001 and 2002 when Thompson Lake pasture received two consecutive years of rest. Parsnip Seeding pasture has only received one year of rest (2010) due to the low number of yearly AUM's (20 year average of 62 AUM's).

Weeds

The nonnative invasive annual grasses, cheatgrass, field brome, and soft brome are found throughout the allotment and lie within an estimated 1,870 acres (15%) of the allotment. Notable invasive forbs, which are concentrated along roads and disturbed areas, include bull thistle (*Cirsium vulgare*), Canadian thistle (*Cirsium arvense*), and Mediterranean sage (*Salvia aethiopsis*). No weed treatments have occurred on the Lane Plan 2 allotment, so far. Currently, these invasive annual grasses and forbs are not outcompeting native vegetation across large areas, but are confined to small patches.

Standard 4. Water Quality: Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards.

In the 1999 RHA this standard was not met and is currently not met in 2017. Both Drake and Parsnip Creeks, from the mouth to the headwaters, do not meet state temperature standards. However, livestock management is not considered to be a significant factor in not meeting the standard, as neither stream is grazed within the allotment, with the exception of small stock water gaps.

Standard 5. Native, T&E, and Locally Important Species: Habitats support healthy, productive and diverse population and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate and landform.

Vegetation

There are currently no special status plants located in Lane Plan 2 allotment. In the 1999 RHA one special status plant, Dwarf lousewort (*Pedicularis centranthera*) was present but it is no longer considered a Special Status/Sensitive species. At that time, the standard was met for T & E vegetation. During the 1999 RHA assessment, Dwarf lousewort occurred along alluvial fans derived from volcanic soils. There were five known populations located within the Lakeview District. Cattle appeared to have no adverse effect on the species, while fire is considered to have a positive effect, increasing vigor and enhancing germination. Currently, Dwarf lousewort is not considered a Special Status Species according to Oregon/Washington (OR/WA) BLM Geographic Information System (GIS) Flora and GeoBOB layers or the Pacific Northwest Interagency Special Status/Sensitive Species Program (ISSSSP) list, updated in July, 2015³.

Fish/Fish Habitat

In the 1999 RHA this standard was met, and is currently being met in 2017. Drake and Parsnip Creeks flow into occupied Warner sucker habitat, which is a Threatened Species under the Endangered Species Act (ESA), however no occupied habitat exists within the allotment. Warner Redband Trout

(*Oncorhynchus mykiss gibbsi*), a Bureau Sensitive Species, is found in both streams, and populations appear to be strong.

Wildlife/Wildlife Habitat

In 1999, this standard was met and is currently being met. The diversity of wildlife species was consistent with productive sagebrush-steppe communities. Deer and pronghorn populations were healthy, while elk populations were low. The allotment was considered to be marginal habitat for California bighorn sheep. Greater Sage-Grouse populations were stable to declining; with six known leks within the allotment. Additionally, the allotment was used by wintering bald eagles (, various bat species, and possibly pygmy rabbits .

Standard 5 is being met for native, T&E and locally important wildlife species in the Lane Plan II Allotment. The diversity of the wildlife and plant species is an indication of health and productivity found within the different habitats in the allotment.

conservation status of “pending.” The pending leks are within the vicinity of Lane, Crump Reservoir

period, chicks require copious amounts of insects, of which, use-varying species of vegetation. Hens

Based on ODFW's 2018 conservation status, there are no occupied leks; however, three of the pending

Pygmy rabbits are not known to occur within the allotment nor is there habitat that has been associated

In the analysis of Standard 5, western juniper cover was the primary cause of some leks being rated

In order to continue meeting Standards within this Land Health Evaluation, it is imperative to continuing treating western juniper expansion and control all non-native invasive species. This includes small isolated and large infestations through updated invasive management plans.

2019 Team Members

Name	Title
LeeAnn McDonald	Wildlife Biologist
John Klock	Botanist
Grace Haskins	Weed Management Specialist
Joe Chigbrow	Interdisciplinary Biologist
James Leal	Fisheries Biologist
Paul Whitman	Planning and Environmental Coordinator
Les Boothe	Assistant Field Manager

Recommendations

Initiate new juniper treatments to reduce juniper cover and restore sagebrush communities.

In areas with juniper control, initiate annual grass control projects and reseed perennial grasses in areas where needed.

2019 Determination

Existing grazing management practices on the Lane Plan 2 Allotment are achieving Oregon Standards for Rangeland Health and conform with the applicable Guidelines for Livestock Grazing Management. While Standard 4 (water Quality) is currently not met, it is due to factors other than livestock grazing.

Existing grazing management practices on the Lane Plan 2 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.



Jami Ludwig, Field Manager

9/27/19

Date

¹ All acreages within allotment derived from GIS layers located on G:\corp\BLMReplication\ORWA_rep_gdb\ and within the mxd file located at G:\lak\lvra_local\Resource_Area_projects\range\Chigbrow\LX_Ranch_AllotmentInfo2017

² ESI polygon data based on current Oregon/Washington BLM GIS "slk_veg" layer located on G:\corp\BLMReplication\ORWA_rep_gdb\ and within the mxd file located at G:\lak\lvra_local\Resource_Area_projects\range\Chigbrow\LX_Ranch_AllotmentInfo2017

³ Pacific Northwest Interagency Special Status/Sensitive Species Program (ISSSSP) under OR/WA Bureau of Land Management, Current Lists: "Federally Threatened, Endangered & Proposed Species, and Bureau Sensitive and Strategic Species List" at <https://www.fs.fed.us/r6/sfpnw/issssp/agency-policy/>

Appendix A – Monitoring Summaries

Table 2a. ESI dominant vegetation communities in Lane Plan 2 Allotment

Vegetation Community		
Plant Code	Scientific Name	Common Name
AGCR	<i>Agropyron cristatum</i>	crested wheatgrass
ARAR8-FEID	<i>Artemisia arbuscula-Festuca idahoensis</i>	low sagebrush-Idaho fescue
ARAR8-POSE	<i>Artemisia arbuscula-Poa secunda</i>	low sagebrush-Sandberg bluegrass
ARAR8-ELEL5	<i>Artemisia arbuscula-Elymus elymoides</i>	low sagebrush-squirreltail
ARTRV-PSSPS	<i>Artemisia tridentata ssp. vaseyana-Pseudoroegneria spicata</i>	mountain big sagebrush-bluebunch wheatgrass
ARTRV-FEID	<i>Artemisia tridentata ssp. vaseyana-Festuca idahoensis</i>	mountain big sagebrush-Idaho fescue
ARTRV-ELEL5	<i>Artemisia tridentata ssp. vaseyana-Elymus elymoides</i>	mountain big sagebrush-squirreltail
JUOC-ARAR8-FEID	<i>Juniperus occidentalis-Artemisia arbuscula-Festuca idahoensis</i>	western juniper-low sagebrush-Idaho fescue
JUOC-ARAR8-ELEL5	<i>Juniperus occidentalis-Artemisia arbuscula-Elymus elymoides</i>	western juniper-low sagebrush-squirreltail
JUOC-ARTRV-PSSPS	<i>Juniperus occidentalis-Artemisia tridentata ssp. vaseyana-Pseudoroegneria spicata</i>	western juniper-mountain big sagebrush-bluebunch wheatgrass
JUOC-ARTRV-ELEL5	<i>Juniperus occidentalis-Artemisia tridentata ssp. vaseyana-Elymus elymoides</i>	western juniper-mountain big sagebrush-squirreltail
JUOC-ARTRV-ACTH7	<i>Juniperus occidentalis-Artemisia tridentata ssp. vaseyana-Achnatherum thurberianum</i>	western juniper-mountain big sagebrush-Thurber's needlegrass
POA	<i>Poa species</i>	bluegrass species
Rockland	N/A	N/A
Unknown*	N/A	N/A

* "Unknown" combines dominate vegetation labeled as "Unknown" + "Incomplete" along with the remaining allotment acres with no classified vegetation communities.

Highlighted rows indicate ESI polygons which had plot data

Table 2b. ESI dominant vegetation communities in Lane Plan 2 Allotment: Soil Surface Factor Acres

Vegetation Community	Acres	% of total acres	SSF Acres					
Plant Code			Stable	Slight	Moderate	Critical	Severe	Unknown
AGCR	519	4%	519	-	-	-	-	-
ARAR8-FEID	866	7%	866	-	-	-	-	-
ARAR8-POSE	5271	42%	3347	1924	-	-	-	-
ARAR8-ELEL5	1920	15%	1712	208	-	-	-	-
ARTRV-PSSPS	671	5%	671	-	-	-	-	-
ARTRV-FEID	< 1	< 1%	-	< 0	-	-	-	-
ARTRV-ELEL5	20	< 1%	20	-	-	-	-	-
JUOC-ARAR8-FEID	275	2%	275	-	-	-	-	-
JUOC-ARAR8-ELEL5	360	3%	360	-	-	-	-	-
JUOC-ARTRV-PSSPS	227	2%	227	-	-	-	-	-
JUOC-ARTRV-ELEL5	3	< 1%	-	3	-	-	-	-
JUOC-ARTRV-ACTH7	619	5%	-	619	-	-	-	-
POA	4	< 1%	-	4	-	-	-	-
Rockland	5	< 1%	-	-	-	-	-	5
Unknown*	1713	14%	-	-	-	-	-	1713

* "Unknown" combines dominate vegetation labeled as "Unknown" + "Incomplete" along with the remaining allotment acres with no classified vegetation communities.

Highlighted rows indicate ESI polygons which had plot data

Table 2c. ESI dominant vegetation communities in Lane Plan 2 Allotment: Observed Apparent Trends Acres

Vegetation Community	Acres	% of total acres	OAT Acres			
Plant Code			Upward	Static	Down	Uknown
AGCR	519	4%	519	-	-	-
ARAR8-FEID	866	7%	866	-	-	-
ARAR8-POSE	5271	42%	1924	3347	-	-
ARAR8-ELEL5	1920	15%	654	1266	-	-
ARTRV-PSSPS	671	5%	671	-	-	-
ARTRV-FEID	< 1	< 1%	-	< 0	-	-
ARTRV-ELEL5	20	< 1%	-	20	-	-
JUOC-ARAR8-FEID	275	2%	275	-	-	-
JUOC-ARAR8-ELEL5	360	3%	-	360	-	-
JUOC-ARTRV-PSSPS	227	2%	227	-	-	-
JUOC-ARTRV-ELEL5	3	< 1%	-	3	-	-
JUOC-ARTRV-ACTH7	619	5%	610	10	-	-
POA	4	< 1%	-	4	-	-
Rockland	5	< 1%	-	-	-	5
Unknown*	1713	14%	-	-	-	1713

* "Unknown" combines dominate vegetation labeled as "Unknown" + "Incomplete" along with the remaining allotment acres with no classified vegetation communities. Highlighted rows indicate ESI polygons which had plot data

Table 2d. ESI dominant vegetation communities in Lane Plan 2 Allotment: Acres within Seral Stage

Vegetation Community	Acres	% of total acres	Acres within Seral Stage				
Plant Code			PNC	Late	Mid	Early	Unknown
AGCR	519	4%	-	519	-	-	-
ARAR8-FEID	866	7%	-	2	864	-	-
ARAR8-POSE	5271	42%	-	-	5271	-	-
ARAR8-ELEL5	1920	15%	-	-	1920	-	-
ARTRV-PSSPS	671	5%	-	466	205	-	-
ARTRV-FEID	< 1	< 1%	-	< 0	-	-	-
ARTRV-ELEL5	20	< 1%	-	-	20	-	-
JUOC-ARAR8-FEID	275	2%	-	-	275	-	-
JUOC-ARAR8-ELEL5	360	3%	-	-	360	-	-
JUOC-ARTRV-PSSPS	227	2%	-	113	114	-	-
JUOC-ARTRV-ELEL5	3	< 1%	-	-	3	-	-
JUOC-ARTRV-ACTH7	619	5%	-	-	619	-	-
POA	4	< 1%	-	23	-	4	-
Rockland	5	< 1%	-	-	-	-	5
Unknown*	1713	14%	-	-	-	-	1713

* "Unknown" combines dominate vegetation labeled as "Unknown" + "Incomplete" along with the remaining allotment acres with no classified vegetation communities.

Highlighted rows indicate ESI polygons which had plot data

Crested wheatgrass dominant vegetation community

PS-450 (Photos)

Years of recorded data: 1968, 1970, 1971, 1976, 1990, 1995, 1998, 2002.

Plot was established in Highway Pasture; however, due to the Hwy 140 realignment, the PS-450 plot no longer exists. Vegetation at this site includes low sagebrush, big sagebrush, rabbitbrush, and crested wheatgrass. Photographs prior to the highway realignment, during 1969-1976, indicate a stable trend; while photographs, during 1990-2002, indicate an upward trend. Vegetation community and soil are consistent for this landform and this region's climate regime.

Low sagebrush-Sandberg bluegrass dominant vegetation community

PS-438 (Photos)

Years of recorded data: 1967, 1969, 1970, 1971, 1973, 1974, 1976, 1981, 1992, 1997, 2001, 2002, 2006, 2009, 2012, 2016.

Plot was established in Parsnip Pasture. Vegetation at this site includes rabbitbrush, low sagebrush, and crested wheatgrass. Photographs indicate no significant changes in vegetation community or cover, vegetation community and soil are consistent for this landform and this region's climate regime; trend is stable.

PS-439B (Photos)

Years of recorded data: 1967, 1969, 1971, 1973, 1978, 1979, 1993, 1995, 1998, 2002, 2006, 2009, 2012.

Plot was established in Parsnip Pasture. Vegetation at this site includes low sagebrush, Idaho fescue and Sandberg bluegrass. Photographs indicate an increase in low sagebrush cover overtime. Vegetation community and soil are consistent for this landform and this region's climate regime.

PS-439C (Photos)

Years of recorded data: 1967, 1969, 1971, 1973, 1976, 1979, 1995, 1998, 2001, 2002, 2009, 2012.

Plot was established in Parsnip Pasture. Vegetation at this site includes low sagebrush, Idaho fescue, and Sandberg bluegrass. Photographs indicate no significant changes in vegetation community or cover, vegetation community and soil are consistent for this landform and this region's climate regime; trend is stable.

PS-451 (Photos)

Years of recorded data: 1968, 1971, 1995, 1998, 2002, 2006, 2009, 2012, 2015.

Plot was established in Parsnip Pasture. Vegetation at this site includes low sagebrush, rabbitbrush, Sandberg bluegrass, and western juniper. Photographs indicate stable trend from 1968-1998, while an upward trend becomes apparent from 2002-2015. Vegetation community and soil are consistent for this landform and this region's climate regime.

PS-454 (Photos)

Years of recorded data: 1968, 1971, 1975, 1978, 1979, 1981, 1989, 1993, 1997, 1998, 2002, 2006, 2009, 2012, 2015.

Plot was established in Thompson Pasture. Vegetation at this site includes low sagebrush, big sagebrush, rabbitbrush, basin wildrye (*Leymus cinereus*), and western juniper. Photographs indicate upward trend in vegetation community and cover (1968-1997), while trend becomes stable from 1998-2015. Vegetation community and soil are consistent for this landform and this region's climate regime.

PS-499A (Photo)

Years of recorded data: 1970, 1971, 1973, 1974, 1976, 1978, 1979, 1981, 1992, 1993, 1997, 1998, 2001, 2002, 2007, 2010, 2015.

Plot was established in Crump Pasture. Vegetation at this site includes low sagebrush, Sandberg bluegrass, and western juniper. Photographs indicate a small amount of juniper thinning in 1998. An upward trend is apparent from 1998-2015. Vegetation community and soil are consistent for this landform and this region's climate regime.

PS-499B (Photo)

Years of recorded data: 1978, 1979, 1980, 1981, 1995, 1998, 2001, 2002, 2007, 2010.

Plot was established in Crump Pasture. Vegetation at this site includes low sagebrush, Sandberg bluegrass, and western juniper. Photographs show an upward trend occurred between 1981 through 1995 after Crump Reservoir washed out in 1980. During 1998 to 2010, photographs indicate no significant changes in vegetation community or cover; trend is stable. Vegetation community and soil are consistent for this landform and this region's climate regime.

LP2-02 (LPI, OAT, Photo, and Step-toe)

Years of recorded data: 1966, 1969, 1971, 1973, 1974, 1976, 1978, 1979, 1981, 1983, 1991, 1997, 2000, 2001, 2003, 2006, 2009, 2012, 2015.

Plot was established in Crump Pasture; this is baseline data for LPI and Step-toe transects, thus no trend. Vegetation primarily includes low sagebrush, Sandberg bluegrass, squirreltail, and soft brome.

Photographs indicate no significant changes in vegetation community or cover. Based on the data, vegetation community and soil are consistent for this landform and this region's climate regime.

Table 3. LP2-02 Step-toe: % Basal Ground Cover

Summary Category	2015
Bare Ground	14
Bare Rock	22
Litter	20
Vegetation	44
Moss, Lichen, Soil Crusts	0

Table 4. LP2-02 Step-toe: % Species Frequency Cover

Plant Code	Scientific Name	Common Name	2015
POSE	<i>Poa secunda</i>	Sandberg bluegrass	38
FEID	<i>Festuca idahoensis</i>	Idaho fescue	1
ELEL5	<i>Elymus elymoides</i>	squirreltail	13
ACTH7	<i>Achnatherum thurberianum</i>	Thurber's needlegrass	2
CAREX	<i>Carex</i> species	sedge species	0
BRHO2	<i>Bromus hordeaceus</i>	soft brome	25
PHLOX	<i>Phlox</i> species	phlox species	2
ANTEN	<i>Antennaria</i> species	pussytoes species	1
Unk Annual Forb	Unk Annual Forb	Unk Annual Forb	20
ARAR8	<i>Artemisia arbuscula</i>	low sagebrush	41
CHRY9	<i>Chrysothamnus</i> species	rabbitbrush species	2

Table 5. LP2-02 LPI: % Shrub Canopy Cover

Transect #	2012	
	ARAR8	CHRY9
1 South	21.4	0
2 North	10.7	0
3 East	11.2	0.7
Average	14.4	0.2

Table 6. LP2-02 Observed Apparent Trend

Year	2000
Vigor	7
Seedlings	8
Surface Litter	5
Pedestals	4
Gullies	5
Total	29
Rating	Upward

OAT ratings

Vigor: High = 10, Low = 1; Seedlings: High # = 10, Low # = 1, Surface Litter: High accumulation= 5, Low accumulation = 1; Pedestals: None to Low pedestaling = 5, High pedestaling = 1, Gullies: None to Low # with stable channels = 5, High # with eroding or fresh channels

LP2-500 (LPI, Photos, and Step-toe)

Years of recorded data: 1970, 1971, 1974, 1976, 1978, 1981, 1992, 1993, 1997, 1998, 2001, 2002, 2006, 2009, 2012, 2015.

Plot was established in Crump Pasture; this is baseline data for LPI and Step-toe transects, thus no trend. Vegetation primarily includes low sagebrush, big sagebrush, Sandberg bluegrass, prairie Junegrass, and western juniper. Photographs indicate an upward trend from 1970-1997, while the remaining photos (1998-2015) show vegetation community and cover remaining stable. Based on the data, vegetation community and soil are consistent for this landform and this region's climate regime.

Table 7. LP2-500 Step-toe: % Basal Ground Cover

Summary Category	2015
Bare Ground	15
Bare Rock	29
Litter	15
Vegetation	41
Moss, Lichen, Soil Crusts	0

Table 8. LP2-500 Step-toe: % Species Frequency Cover

Plant Code	Scientific Name	Common Name	2015
POSE	<i>Poa secunda</i>	Sandberg bluegrass	42
FEID	<i>Festuca idahoensis</i>	Idaho fescue	2
KOMA	<i>Koeleria macrantha</i>	prairie Junegrass	3
POBU	<i>Poa bulbosa</i>	bulbous bluegrass	1
ELEL5	<i>Elymus elymoides</i>	squirreltail	2
ACTH7	<i>Achnatherum thurberianum</i>	Thurber's needlegrass	1
CAREX	<i>Carex</i> species	sedge species	1
BRTE	<i>Bromus tectorum</i>	cheatgrass	3
BRHO2	<i>Bromus hordeaceus</i>	soft brome	1
PHLOX	<i>Phlox</i> species	phlox species	8
ANTEN	<i>Antennaria</i> species	pussytoes species	1
Unk Annual Forb	Unk Annual Forb	Unk Annual Forb	0
ARAR8	<i>Artemisia arbuscula</i>	low sagebrush	25
ARTR2	<i>Artemisia tridentata</i>	big sagebrush	14

Table 9. LP2-500 LPI: % Shrub Canopy Cover

Transect #	2012				
	ARTR*	PUTR2	CHIVI8	ERNA10	JUOC
1 West	20	0	1	0	0
2 South	10.3	2.8	3.5	0	26
3 North	15	0	4.7	5.2	0
Average	15.1	0.9	3.1	1.7	8.7

* The canopy appeared to include both low sagebrush (ARAR8) and big sagebrush (ARTR2) in the same column.

PS-439A (LPI, Photos, and Step-toe)

Years of recorded data: 1967, 1969, 1971, 1973, 1978, 1979, 1990, 1995, 1998, 2001, 2002, 2009, 2012, 2015.

Plot was established in Parsnip Pasture; this is baseline data for LPI and Step-toe transects, thus no trend. Vegetation primarily includes low sagebrush, Sandberg bluegrass, and Idaho fescue.

Photographs indicate no significant changes in vegetation community or cover; trend is stable. Based on the data, vegetation community and soil are consistent for this landform and this region's climate regime.

Table 10. PS-439A Step-toe: % Basal Ground Cover

Summary Category	2015
Bare Ground	13
Bare Rock	28
Litter	12
Vegetation	40
Moss, Lichen, Soil Crusts	7

Table 11. PS-439A Step-toe: % Species Frequency Cover

Plant Code	Scientific Name	Common Name	2015
POSE	<i>Poa secunda</i>	Sandberg bluegrass	62
FEID	<i>Festuca idahoensis</i>	Idaho fescue	7
ELEL5	<i>Elymus elymoides</i>	squirreltail	2
CAREX	<i>Carex</i> species	sedge species	1
PHLOX	<i>Phlox</i> species	phlox species	15
Moss	N/A	moss species	7
ARAR8	<i>Artemisia arbuscula</i>	low sagebrush	13
Unk Annual Forb	Unk Annual Forb	Unk Annual Forb	1

Table 12. PS-439A LPI: % Shrub Canopy Cover

	2012
Transect #	ARTR
1 South-SE	23.1
2 West-SW	15.8
3 North-NW	22.2
Average	20.4

LA-INTS-017 (AIM)

Year of recorded data: 2016

Plot was established in Crump Pasture; this is baseline data, thus no trend. Vegetation primarily includes low sagebrush, and Sandberg bluegrass. Based on this year's data, vegetation community and soil are consistent for this landform and this region's climate regime.

Table 13. LA-INTS-017: Cover/Litter Report

Summary Category	Avg. %
Foliar Cover	46.0
Bare Ground	18.0
Bare Lichen Between-Plant Cover	0.0
Bare Moss Between-Plant Cover	0.0
Litter Between-Plant Cover	20.7
Bare Rock Between-Plant Cover	15.3

Table 14. LA-INTS-017 LPI: Cover Estimates by Species

Plant Code	Scientific Name	Common Name	Foliar Cover %
POSE	<i>Poa secunda</i>	Sandberg bluegrass	10.7
PHHO	<i>Phlox hoodii</i>	spiny phlox	2.0
PHLO2	<i>Phlox longifolia</i>	longleaf phlox	0.7
AGGL	<i>Agoseris glauca</i>	pale agoseris	0.7
ASFI	<i>Astragalus filipes</i>	basalt milkvetch	0.7
COPA3	<i>Collinsia parviflora</i>	maiden blue eyed Mary	1.3
ARAR8	<i>Artemisia arbuscula</i>	low sagebrush	35.3

Table 15. LA-INTS-017 Soil Stability

	All Samples	Samples with Foliar Cover	Samples without Foliar Cover
Plot Avg.	3.1	3.4	2.6
Line 1 Avg.	3.8	3.8	0.0
Line 2 Avg.	1.5	1.5	1.5
Line 3 Avg.	3.8	4.3	3.3

SFA-GRSG-061 (AIM and RHI)

Year of recorded data: 2016

Plot was established in Crump Pasture; this is baseline data, thus no trend. Vegetation primarily includes low sagebrush, soft brome, and Sandberg bluegrass. Based on this year's data, vegetation community and soil are consistent for this landform and this region's climate regime.

Table 16. SFA-GRSG-061: Cover/Litter Report

Summary Category	Avg. %
Foliar Cover	54.7
Bare Ground	15.3
Bare Lichen Between-Plant Cover	0.0
Bare Moss Between-Plant Cover	0.0
Litter Between-Plant Cover	16.7
Bare Rock Between-Plant Cover	13.3

Table 17. SFA-GRSG-061 LPI: Cover Estimates by Species

Plant Code	Scientific Name	Common Name	Foliar Cover %
POSE	<i>Poa secunda</i>	Sandberg bluegrass	12.7
ELEL5	<i>Elymus elymoides</i>	squirreltail	2.0
BRHO2	<i>Bromus hordeaceus</i>	soft brome	14.7
B RTE	<i>Bromus tectorum</i>	cheatgrass	3.3
LOTR2	<i>Lomatium triternatum</i>	nineleaf biscuitroot	4.0
PHHO	<i>Phlox hoodii</i>	spiny phlox	4.0
PHLO2	<i>Phlox longifolia</i>	longleaf phlox	4.0
ASFI	<i>Astragalus filipes</i>	basalt milkvetch	2.7
LUAR3	<i>Lupinus argenteus</i>	silvery lupine	2.7
ANDI2	<i>Antennaria dimorpha</i>	low pussytoes	0.7
LAGL5	<i>Layia glandulosa</i>	whitedaisy tidytips	0.7
ARAR8	<i>Artemisia arbuscula</i>	low sagebrush	18.7
JUOC	<i>Juniperus occidentalis</i>	western juniper	0.7

Table 18. SFA-GRSG-061 Soil Stability

	All Samples	Samples with Foliar Cover	Samples without Foliar Cover
Plot Avg.	2.7	3.0	2.3
Line 1 Avg.	2.5	1.0	2.8
Line 2 Avg.	2.8	2.8	0.0
Line 3 Avg.	2.7	4.5	1.8

Table 19. SFA-GRSG-061 Rangeland Health Indicators

Soil/Site Stability					Hydrologic Function					Biotic Integrity				
ET	ME	M	SM	NS	ET	ME	M	SM	NS	ET	ME	M	SM	NS
				11					14					
			7	9					11					
			3	8				3	10					
			2	6			4	2	9					16
		4	1	5			1	1	8			17		13
									5					12
Average rating		SM			Average rating		NS			Average rating		NS		

Indicators

- | | | | |
|---------------------------------|---|--------------------------------------|---------------------|
| 1: Rills | 6: Wind scour and/or Depositional areas | 11: Soil compaction layer(s) | 16: Invasive plants |
| 2: Water flow patterns | 7: Litter movement | 12: Functional/Structural groups | 17: Reproductive |
| 3: Pedestals and/or Terracettes | 8: Soil surface resistance to erosion | 13: Plant mortality/decadence | |
| 4: Bare ground | 9: Soil surface loss/degradation | 14: Litter amount | |
| 5: Gullies | 10: Plant community relative to infiltration/runoff | 15: Annual production (not recorded) | |

Indicator Ratings

ET = Extreme to Total ME = Moderate to Extreme M = Moderate SM = Slight to Moderate NS = None to Slight

Mountain big sagebrush-bluebunch wheatgrass dominant vegetation community

LA-INTS-013 (AIM)

Year of recorded data: 2016

Plot was established in Crump Pasture; this is baseline data, thus no trend. Vegetation primarily includes low sagebrush, Sandberg bluegrass, and western juniper. Based on this year's data, vegetation community and soil are consistent for this landform and this region's climate regime.

Table 20. LA-INTS-013: Cover/Litter Report

Summary Category	Avg. %
Foliar Cover	65.3
Bare Ground	12.7
Bare Moss Between-Plant Cover	4.7
Bare Lichen Between-Plant Cover	0.7
Litter Between-Plant Cover	8.7
Bare Rock Between-Plant Cover	8.0

Table 21. LA-INTS-013 LPI: Cover Estimates by Species

Plant Code	Scientific Name	Common Name	Foliar Cover %
POSE	<i>Poa secunda</i>	Sandberg bluegrass	28.0
NAPU4	<i>Nassella pulchra</i>	purple needlegrass	2.0
ARAC2	<i>Arenaria aculeata</i>	prickly sandwort	8.0
ERBL	<i>Erigeron bloomeri</i>	scabland fleabane	2.0
ANDI2	<i>Antennaria dimorpha</i>	low pussytoes	1.3
CROC	<i>Crepis occidentalis</i>	largeflower hawksbeard	0.7
COPA3	<i>Collinsia parviflora</i>	maiden blue eyed Mary	0.7
ARAR8	<i>Artemisia arbuscula</i>	low sagebrush	37.3
JUOC	<i>Juniperus occidentalis</i>	western juniper	3.3

Table 22. LA-INTS-013 Soil Stability

	All Samples	Samples with Foliar Cover	Samples without Foliar Cover
Plot Avg.	3.0	2.9	3.2
Line 1 Avg.	3.5	2.8	5.0
Line 2 Avg.	1.8	1.7	2.0
Line 3 Avg.	3.7	3.7	0.0

SFA-FO-OTH-005 (AIM and RHI)

Year of recorded data: 2016

Plot was established in Crump Pasture; this is baseline data, thus no trend. Vegetation primarily includes antelope bitterbrush, Wyoming big sagebrush, and Sandberg bluegrass. Based on this year’s data, vegetation community and soil are consistent for this landform and this region’s climate regime.

Table 23. SFA-FO-OTH-005: Cover/Litter Report

Summary Category	Avg. %
Foliar Cover	46.0
Bare Ground	26.7
Bare Lichen Between-Plant Cover	0.0
Bare Moss Between-Plant Cover	1.3
Litter Between-Plant Cover	14.0
Bare Rock Between-Plant Cover	12.0

Table 24. SFA-FO-OTH-005 LPI: Cover Estimates by Species

Plant Code	Scientific Name	Common Name	Foliar Cover %
POSE	<i>Poa secunda</i>	Sandberg bluegrass	24.7
PSSPS	<i>Pseudoroegneria spicata</i>	bluebunch wheatgrass	2.0
ANDI2	<i>Antennaria dimorpha</i>	low pussytoes	0.7
IOAL	<i>Ionactis alpina</i>	Lava aster	0.7
LUAR3	<i>Lupinus argenteus</i>	silvery lupine	0.7
PHHO	<i>Phlox hoodii</i>	spiny phlox	0.7
PHLO2	<i>Phlox longifolia</i>	longleaf phlox	0.7
PUTR2	<i>Purshia tridentata</i>	antelope bitterbrush	11.3
ARTRW8	<i>Artemisia tridentata</i> ssp. <i>Wyomingensis</i>	Wyoming big sagebrush	6.0
ARCA13	<i>Artemisia cana</i>	silver sagebrush	2.7
ARAR8	<i>Artemisia arbuscula</i>	low sagebrush	1.3
CHVI8	<i>Chrysothamnus viscidiflorus</i>	yellow rabbitbrush	0.7
ERNA10	<i>Ericameria nauseosa</i>	rubber rabbitbrush	0.7
JUOC	<i>Juniperus occidentalis</i>	western juniper	1.3

Table 25. SFA-FO-OTH-005 Soil Stability

	All Samples	Samples with Foliar Cover	Samples without Foliar Cover
Plot Avg.	3.1	3.2	2.8
Line 1 Avg.	2.8	3.0	2.0
Line 2 Avg.	3.7	3.8	3.0
Line 3 Avg.	2.7	2.3	3.0

Table 26. SFA-FO-OTH-005 Rangeland Health

Soil/Site Stability					Hydrologic Function					Biotic Integrity				
ET	ME	M	SM	NS	ET	ME	M	SM	NS	ET	ME	M	SM	NS
1		4	2	11	1		4	2	14			13		
		3		9			3		11					
				8					10					
				7					9					
				6					8					
				5					5					
Average rating		SM			Average rating		SM			Average rating		NS		

Indicators

- | | | | |
|---------------------------------|---|--------------------------------------|---------------------|
| 1: Rills | 6: Wind scour and/or Depositional areas | 11: Soil compaction layer(s) | 16: Invasive plants |
| 2: Water flow patterns | 7: Litter movement | 12: Functional/Structural groups | 17: Reproductive |
| 3: Pedestals and/or Terracettes | 8: Soil surface resistance to erosion | 13: Plant mortality/decadence | |
| 4: Bare ground | 9: Soil surface loss/degradation | 14: Litter amount | |
| 5: Gullies | 10: Plant community relative to infiltration/runoff | 15: Annual production (not recorded) | |

Indicator Ratings

ET = Extreme to Total ME = Moderate to Extreme M = Moderate SM = Slight to Moderate NS = None to Slight

Western juniper-low sagebrush-Idaho fescue dominant vegetation community

LP2-03A (OAT and Photos)

Years of recorded data: 1970, 1971, 1972, 1973, 1975, 1977, 1979, 1981, 1989, 1990, 1995, 2000, 2003, 2006, 2009, 2012, 2015.

Plot was established in Thompson Pasture. Vegetation at this site includes antelope bitterbrush, big sagebrush, Sandberg bluegrass, and western juniper. Photographs indicate no significant changes in vegetation community or cover; trend is stable. Based on the data, vegetation community and soil are consistent for this landform and this region's climate regime.

Table 27. LP2-03A Observed Apparent Trend

Year	2000
Vigor	8
Seedlings	9
Surface Litter	5
Pedestals	5
Gullies	5
Total	32
Rating	Upward

OAT ratings

Vigor: High = 10, Low = 1; Seedlings: High # = 10, Low # = 1, Surface Litter: High accumulation = 5, Low accumulation = 1; Pedestals: None to Low pedestaling = 5, High pedestaling = 1, Gullies: None to Low # with stable channels = 5, High # with eroding or fresh channels

Western juniper-mountain big sagebrush-Thurber's needlegrass dominant vegetation community

LP2-03B (LPI, OAT, and Step-toe)

Years of recorded data: 1970, 1971, 1972, 1973, 1975, 1977, 1978, 1979, 1981, 1995, 2000, 2003, 2009, 2012, 2015.

Plot was established in Thompson Pasture; this is baseline data, thus no trend. Vegetation at this site includes antelope bitterbrush, big sagebrush, Sandberg bluegrass, and squirreltail. Photographs indicate no significant changes in vegetation community or cover; trend is stable. Based on the data, vegetation community and soil are consistent for this landform and this region's climate regime.

Table 28. LP2-03B Observed Apparent Trend

Year	2000
Vigor	5
Seedlings	6
Surface Litter	4
Pedestals	4
Gullies	5
Total	24
Rating	Stable

OAT ratings

Vigor: High = 10, Low = 1; Seedlings: High # = 10, Low # = 1, Surface Litter: High accumulation= 5, Low accumulation = 1; Pedestals: None to Low pedestaling = 5, High pedestaling = 1, Gullies: None to Low # with stable channels = 5, High # with eroding or fresh channels

Table 29. LP2-03B Step-toe: % Basal Ground Cover

Summary Category	2015
Bare Ground	5
Bare Rock	21
Litter	19
Vegetation	54
Moss, Lichen, Soil Crusts	1

Table 30. LP2-03B % Species Frequency Cover

Plant Code	Scientific Name	Common Name	2015
POSE	<i>Poa secunda</i>	Sandberg bluegrass	38
FEID	<i>Festuca idahoensis</i>	Idaho fescue	4
ELEL5	<i>Elymus elymoides</i>	squirreltail	9
ACTH7	<i>Achnatherum thurberianum</i>	Thurber's needlegrass	4
CAREX	<i>Carex</i> species	sedge species	2
BRTE	<i>Bromus tectorum</i>	cheatgrass	2
Moss	N/A	moss species	1
Unk Annual Forb	Unk Annual Forb	Unk Annual Forb	3
ARTR2	<i>Artemisia tridentata</i>	big sagebrush	25
ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	mountain big sagebrush	0
PUTR2	<i>Purshia tridentata</i>	antelope bitterbrush	18
CHRY9	<i>Chrysothamnus</i> species	rabbitbrush species	0
JUOC	<i>Juniperus occidentalis</i>	western juniper	0

Table 31. LP2-03B LPI: % Shrub Canopy Cover

	2012		
Transect #	ARTR2	PUTR2	CHRY9
1 South	27.6	14.1	8.5
2 North	25.9	5.9	0
3 East	21.7	12.2	0
Average	25.1	10.7	2.8

Table 32. Lane Plan 2 Allotment (#00206) Actual Use and Utilization Data by Year

Year	Crump Reservoir Seasonal Use (Days)	Crump Reservoir AUM's	% Utilization Crump	Parsnip Seeding Seasonal Use (Days)	Parsnip Seeding AUM's	% Utilization Parsnip Seeding	Thompson Lake Seasonal Use (Days)	Thompson Lake AUM's	% Utilization Thompson Lake	Total AUM's
2016	90	408	33	4	18	25	Rested	0	-	426
2015	Rested	0	-	14	64	47	66	299	52	363
2014	78	354	49	7	32	-	Rested	0	-	386
2013	Rested	0	-	12	50	-	86	386	-	436
2012	78	354	42	13	54	42	Rested	0	-	408
2011	Rested	0	-	13	46	-	69	305	43	351
2010	48	248	42	Rested	0	-	Rested	0	-	248
2009	Rested	0	-	9	42	46	66	310	52	352
2008	83	386	42	11	49	-	Rested	0	-	435
2007	Rested	0	-	13	59	39	74	336	53	395
2006	90	408	-	6	27	-	Rested	0	-	435
2005	Rested	0	-	14	64	-	89	410	41	474
2004	77	358	-	14	63	-	Rested	0	-	421
2003	Rested	0	-	22	100	-	64	298	-	398
2002	73	323	36	18	78	52	Rested	0	-	401
2001	78	366	-	12	54	-	Rested	0	-	420
2000	Rested	0	-	25	105	37	72	321	44	426
1999	64	337	25	22	112	55	Rested	0	-	449
1998	Rested	0	-	15	67	19	71	353	31	420
1997	77	419	37	28	149	46	Rested	0	-	568
1996	Rested	0	-	28	146	36	61	309	44	455
1995	-	-	26	-	-	-	-	-	-	
1994	-	-	-	-	-	-	-	-	-	
1993	Lane Plan 2 Allotment is grazed during spring into early summer, April 1 st through July 10 th , under a rest-									
1992	rotation grazing management system. The total AUM's permitted are 450, which was only exceeded in -									
1991	1997. The total average actual use over the last 10 years has been 380 AUM's:- During the years when -									
1990	utilization was collected, the target utilization of 50% was exceeded 40 5 times, 2 years on the Parsnip 40									
1989	Seeding pasture and 3 years on the Thompson Lake pasture. Parsnip Seeding pasture does not receive -									
1988	rest due to the low amount of AUM's grazed each year. - - - -									
1987	-	-	31	-	-	48	-	-	-	
1986	-	-	-	-	-	-	-	-	-	
1985	-	-	40	-	-	48	-	-	-	
Recent 10 year Average	75	175	42	11	41	40	72	164	50	380
Overall Average	76	189	34	15	66	43	72	158	44	413

Table 33. Summary of Warner-Tucker Hill Fine-Scale Habitat for spring, summer, and winter within occupied and unoccupied habitat.

Area of Habitat		2446	1940.5	1969.5	5373.6
Occupancy	Habitat	Spring	Summer	Winter	Fine-scale
Occupied (42%)	Existing Sagebrush	1348.3	1177.1	1231.7	1616.8
	Percent of Habitat	55%	61%	63%	30%
	Potential Sagebrush	178.8	149.7	154.2	256.2
	Percent of Habitat	7%	8%	8%	5%
<i>Subtotal Occupied Suitable</i>		1348.3	1177.1	1231.7	1616.8
Unoccupied (58%)	Existing Sagebrush	440	204.3	258.1	1345.5
	Percent of Habitat	18%	11%	13%	25%
	Potential Sagebrush	152	74.6	177.8	1698.9
	Percent of Habitat	6%	4%	9%	32%
<i>Subtotal Unoccupied Suitable</i>		440	204	258	1346
Both	Non-habitat (12%)				456
				Total	5374

Potential & Available Habitat: % of Season	87%	83%	93%	92%
Occupied by season	1713			0
Existing Sagebrush	73%	71%	76%	55%
Potential Sagebrush	14%	12%	17%	36%

Table 34. Summary of site-scale sage-grouse habitat suitability ratings and proportional area estimates (80% confidence interval) for seasonal habitat types in the Warner-Tucker Hill fine-scale habitat analysis area, Oregon. Proportional area estimate is based on unequal weighting of plots.

Seasonal Habitat	Number of Leaks, Plots or Sites			Proportional Area Estimate		
	Suitable	Marginal	Unsuitable	Suitable	Marginal	Unsuitable
Breeding (Lekking)	37 leks	25 leks	14 leks	NA	NA	NA
Breeding (Nesting/Early Brood-rearing)	27	5	3	63.5% CI [55.3, 71.8]	8.2% CI [3.2, 13.2]	28.3% CI [18.7, 37.9]
Upland Summer/Late Brood-rearing	15	4	3	69.3% CI [55.3, 83.4]	17.0% CI [7.5, 26.4]	13.7% CI [3.3, 24.1]
Riparian Summer/Late Brood-rearing	9 sites	8 sites	2 sites	NA	NA	NA
Winter	52	2	8	82.5% CI [76.2, 88.9]	4.6% CI [0, 9.0]	12.9% CI [6.9, 18.9]

Table 35. Simple suitability proportions of Legacy HAF points

Site-Scale Habitat Type	# of Sample Locations within Home Range	Suitable Proportions	Marginal Proportions	Unsuitable Proportions
Breeding Habitat (Nesting/Early Brood Rearing) (Form S-3)	61	52%	25%	23%
Upland Summer/Late Brood-Rearing Habitat (Form S-4)	24	46%	29%	25%
Winter Habitat (Form S-6)	111	63%	19%	18%

Table 36. Greater sage-grouse nesting/early brood-rearing (spring) habitat suitability proportional area estimates using plots sampled within habitat objectives table date range within the Lane Plan II Allotment (80% confidence Interval, n =5).

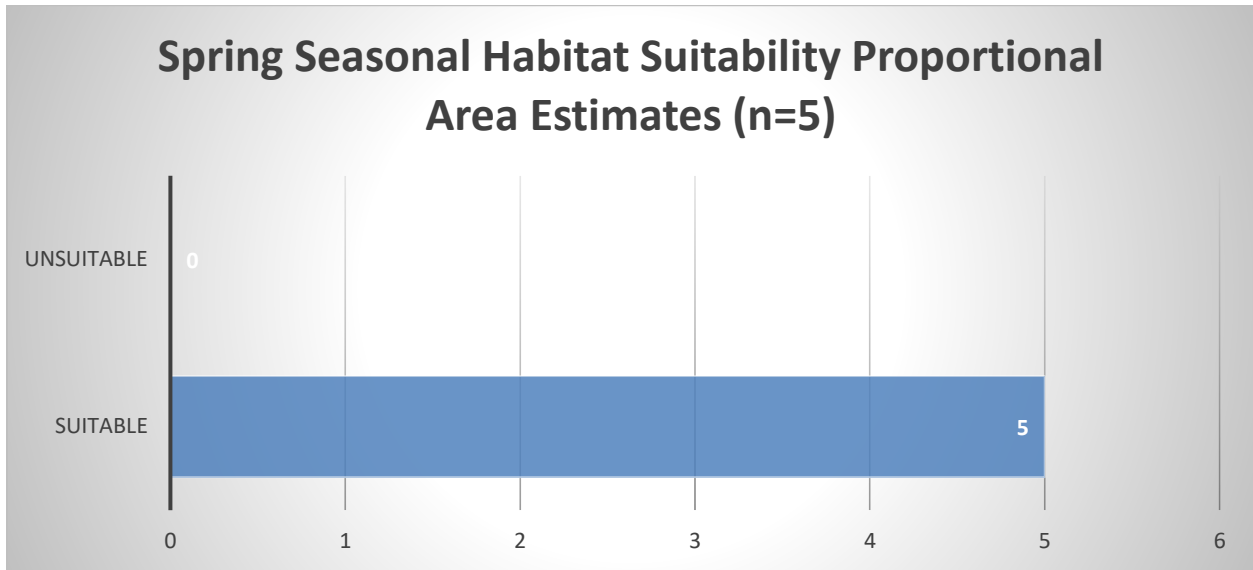
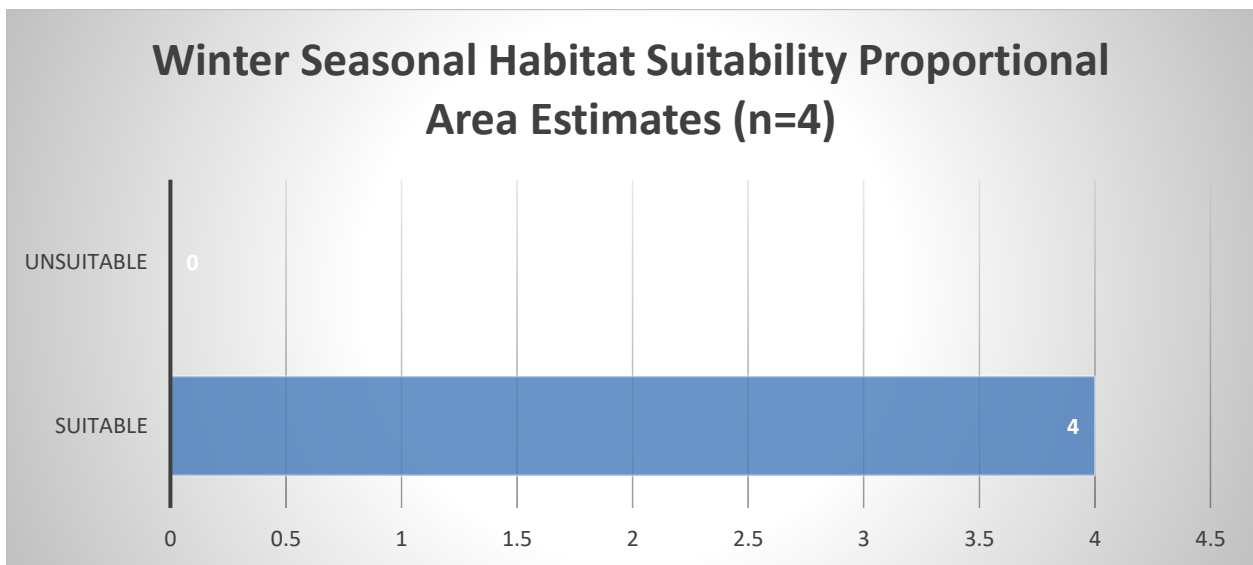


Table 37. Greater sage-grouse winter habitat suitability proportional area estimates within the Lane Plan II Allotment (n = 4). Winter analysis was not limited by sample date; confidence interval is unknown.



Appendix C. ARMPA Habitat Objectives Table 2-2 (BLM 2015)

**Table 2-2
Habitat Objectives for Greater Sage-grouse**

Attribute	Indicators	Desired Condition (Habitat Objectives)	Reference
Breeding Including Lekking, Pre-nesting, Nesting, and Early Brood Rearing (Seasonal Use Period March 1 – June 30)			
Lek Security	Proximity of trees or other tall structures	No conifers or tall structures within 1.0 mile of lek center, and conifer cover less than 5% within 4.0 miles of lek, excluding old trees, culturally significant, actively used by special status species, and old growth juniper stands.	Connelly et al. 2000; Fresse 2009; Baruch-Mordo et al. 2013; Knick et al. 2013
	Proximity of sagebrush to leks	Lek has adjacent sagebrush cover	Connelly et al. 2000
Cover	Sagebrush cover (%)	10 to 25	Doescher et al. 1986; Gregg et al. 1994; Hanf et al. 1994; Coggins 1998; Crawford and Carver 2000; Bates and Davies 2014; BLM 2015a
	Sagebrush height (inches) Arid sites (warm-dry) Mesic sites (cool-moist)	11 to 31 15 to 31	Gregg et al. 1994; Hanf et al. 1994; Coggins 1998; Crawford and Carver 2000; Fresse 2009.
	Predominant sagebrush shape	Spreading	Connelly et al. 2000
	Perennial grass cover (such as bunchgrass) (%) Arid sagebrush Warm-dry Shallow-dry Mesic sagebrush Cool-moist Warm-moist	10 to 30 10 to 25 20 to 45 20 to 50	Gregg et al. 1994; Coggins 1998; Crawford and Carver 2000; Fresse 2009; NRCS 2015; Bates and Davies 2014; Jon Bates, USDA ARS, pers.comm. 2/10/2015; BLM 2015a; BLM 2015b
	Perennial grass and forb height (inches, including residual grasses) – most important and appropriately measured in nest areas; excludes shallow-dry sites ¹ Arid sites (warm-dry) Mesic sites (cool-moist)	≥ 7 ≥ 9	Gregg et al. 1994; Hanf et al. 1994; Crawford and Carver 2000; Hagen et al. 2007; Jon Bates, USDA ARS, pers.comm. 2/10/2015

**Table 2-2
Habitat Objectives for Greater Sage-grouse**

Attribute	Indicators	Desired Condition (Habitat Objectives)	Reference
	Perennial forb cover (%) ² Arid sagebrush Warm-dry Shallow-dry Mesic sagebrush Cool-moist Warm-moist	2 to 10 2 to 10 6 to 12 5 to 15	Drut 1992; Drut et al. 1994; Crawford and Carver 2000; Freese 2009; NRCS 2015; Bates and Davies 2014; BLM 2015a; Jon Bates, USDA ARS, pers.comm. 2/10/2015; BLM 2015b
Food	Preferred forb diversity and availability	Preferred forbs are common with 5 to 10 species present ²	Hanf et al. 1994; Crawford and Carver 2000; Freese 2009; Bates and Davies 2014; BLM 2015a; Jon Bates, USDA ARS, pers.comm. 2/10/2015
Available Suitable Habitat (Landscape Context)	% of seasonal habitat within 4.0 miles of leks meeting a majority of the desired conditions Arid sagebrush Mesic sagebrush	70 (55-85) 75 (60-90)	Connelly et al. 2000; Karl and Sadowski 2005; Evers 2010; Hagen 2011; NRCS 2015
Brood-rearing/Summer Including Late-brood Rearing, Summering, and Early Autumn (Seasonal Use Period July 1- October 31)			
Cover	Sagebrush cover (%)	10 to 25	Doescher et al. 1986; Drut et al. 1994; Connelly et al. 2000; Crawford and Carver 2000; Bates and Davies 2014; Jon Bates, USDA ARS, pers.comm. 2/10/2015
	Sagebrush height (inches)	15 to 31	Gregg et al. 1994; Hanf et al. 1994; Crawford and Carver 2000; Freese 2009
	Perennial herbaceous (grass and forbs) cover (%) Arid sagebrush Warm-dry Shallow-dry Mesic sagebrush Cool-moist Warm-moist Riparian ³	15 to 30 10 to 25 20 to 45 30 to 55 ≥ 50	Drut et al. 1994; Bates and Davies 2014; NRCS 2015; BLM 2015b; Jon Bates, USDA ARS, pers.comm. 2/10/2015
	Riparian areas/mesic meadows	Majority of areas are in PFC	Stiver et al. 2010, or as updated
Food	Upland and riparian perennial forb availability	Preferred forbs are common with 5 to 10 species present ⁴	Hanf et al. 1994; Freese 2009; Bates and Davies 2014; BLM 2015b; Jon Bates, USDA ARS, pers.comm. 2/10/2015

**Table 2-2
Habitat Objectives for Greater Sage-grouse**

Attribute	Indicators	Desired Condition (Habitat Objectives)	Reference
Available Suitable Habitat (Landscape Context)	% of seasonal habitat within 4.0 miles of leks meeting a majority of the desired conditions		Connelly et al. 2000; Karl and Sadowski 2005; Evers 2010; Hagen 2011; NRCS 2015
	Arid sagebrush Mesic sagebrush	70 (55-85) 75 (60-90)	
Winter Including Late Autumn and Winter (Seasonal Use Period November 1 – February 28)			
Cover and Food	Sagebrush cover above snow (%)	≥ 10	Willis 1990 (in Hagen 2011); Bruce 2011
	Sagebrush height above snow (inches)	≥10	Willis 1990 (in Hagen 2011); Bruce 2011
Available Suitable Habitat (Landscape Context)	% of wintering habitat meeting a majority of the desired conditions		Connelly et al. 2000; Karl and Sadowski 2005; Evers 2010; NRCS 2015
	Arid sagebrush Mesic sagebrush	70 (55-85) 85 (68-100)	

¹Perennial grass and forb minimum height may not be achievable in years with below normal precipitation. Other indicators of desired condition may still render the site suitable, however.

²In very dry years, forb cover and availability may not be at the desired condition, and in certain plant associations such as Wyoming big sagebrush/Needle and Thread, these indicators may rarely be achieved even in years with normal precipitation.

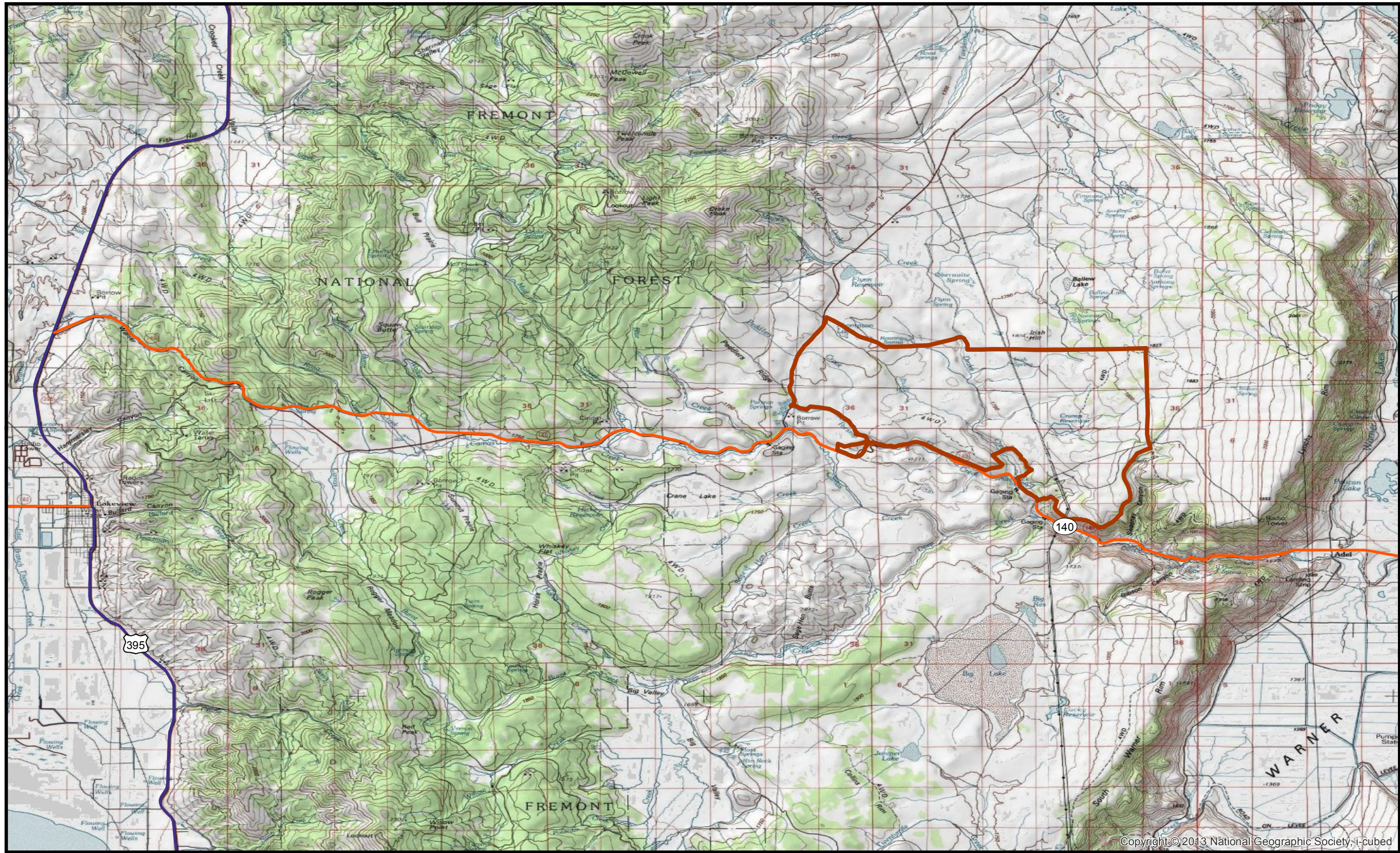
³Riparian includes swales, wet meadows, and intermittent/ephemeral streams.




⁴Sage-grouse preferred forbs are listed in Appendix I.

Appendix D. Literature Cited

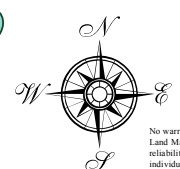
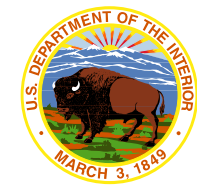
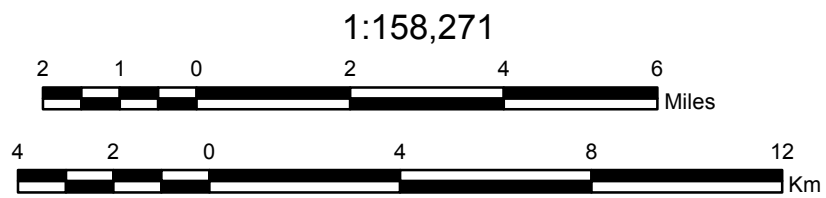
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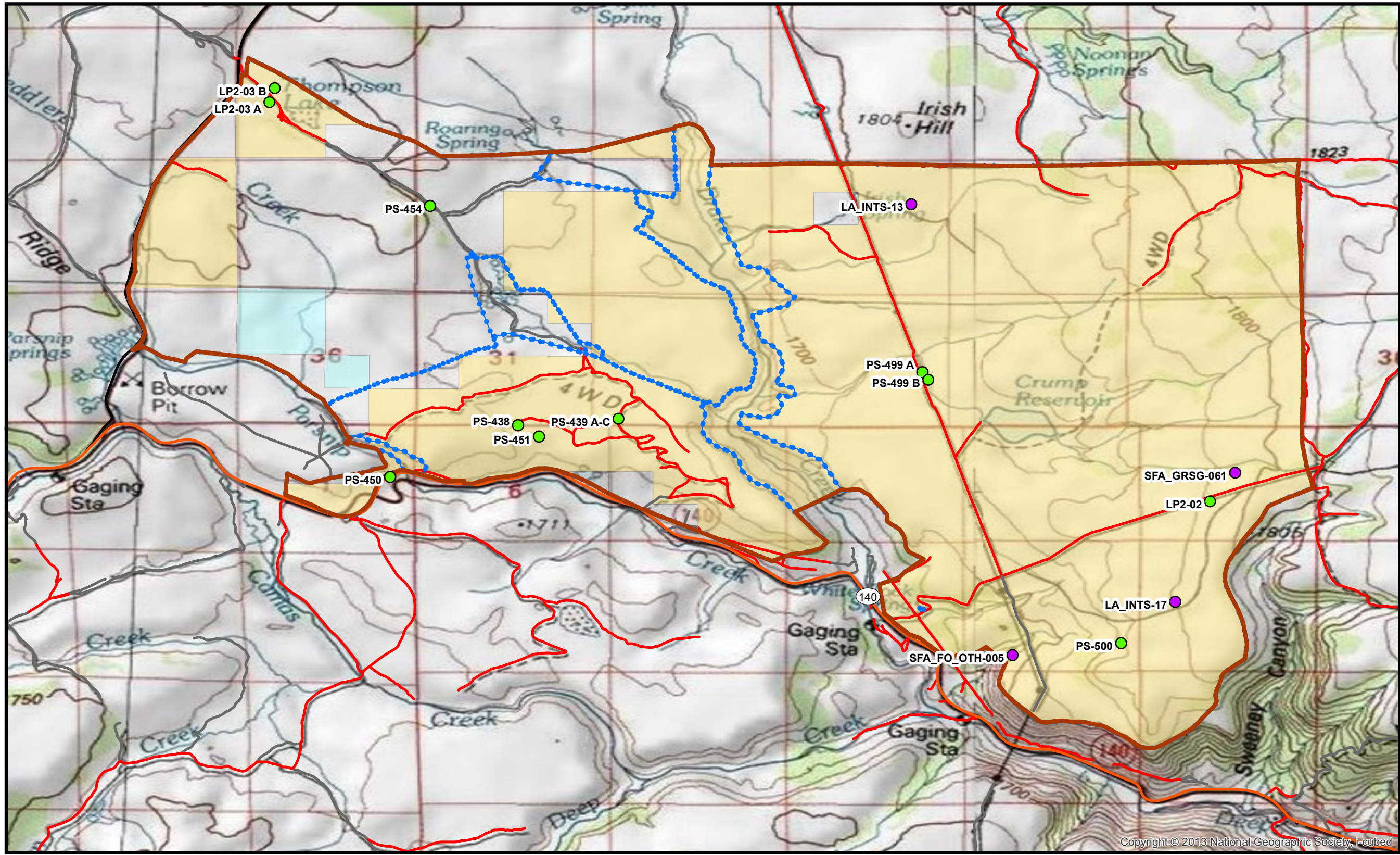
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-  Lane Plan 2
 - Highways**
 -  State Highway
 -  US Highway

Lane Plan 2 Allotment
Map 1



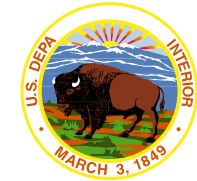
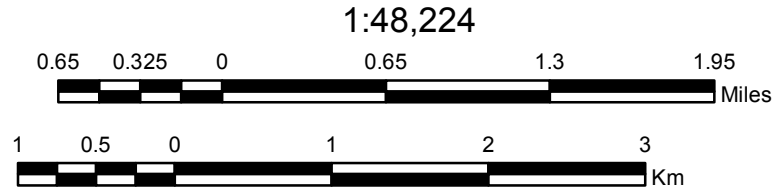
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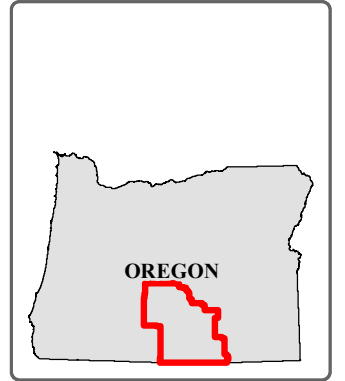


- ### Legend
- Lane Plan 2**
 - Allotment (Brown outline)
 - Pastures (Blue dotted line)
 - Land Ownership**
 - Bureau of Land Management (Yellow fill)
 - Private (White fill)
 - State (Light blue fill)
 - Monitoring Plots**
 - AIM plots (Purple dot)
 - Photo/Transect plots (Green dot)
 - Roads**
 - State Highway (Orange line)
 - US Highway (Blue line)
 - County route (Black line)
 - Bureau of Land Management (Red line)
 - Other (Grey line)

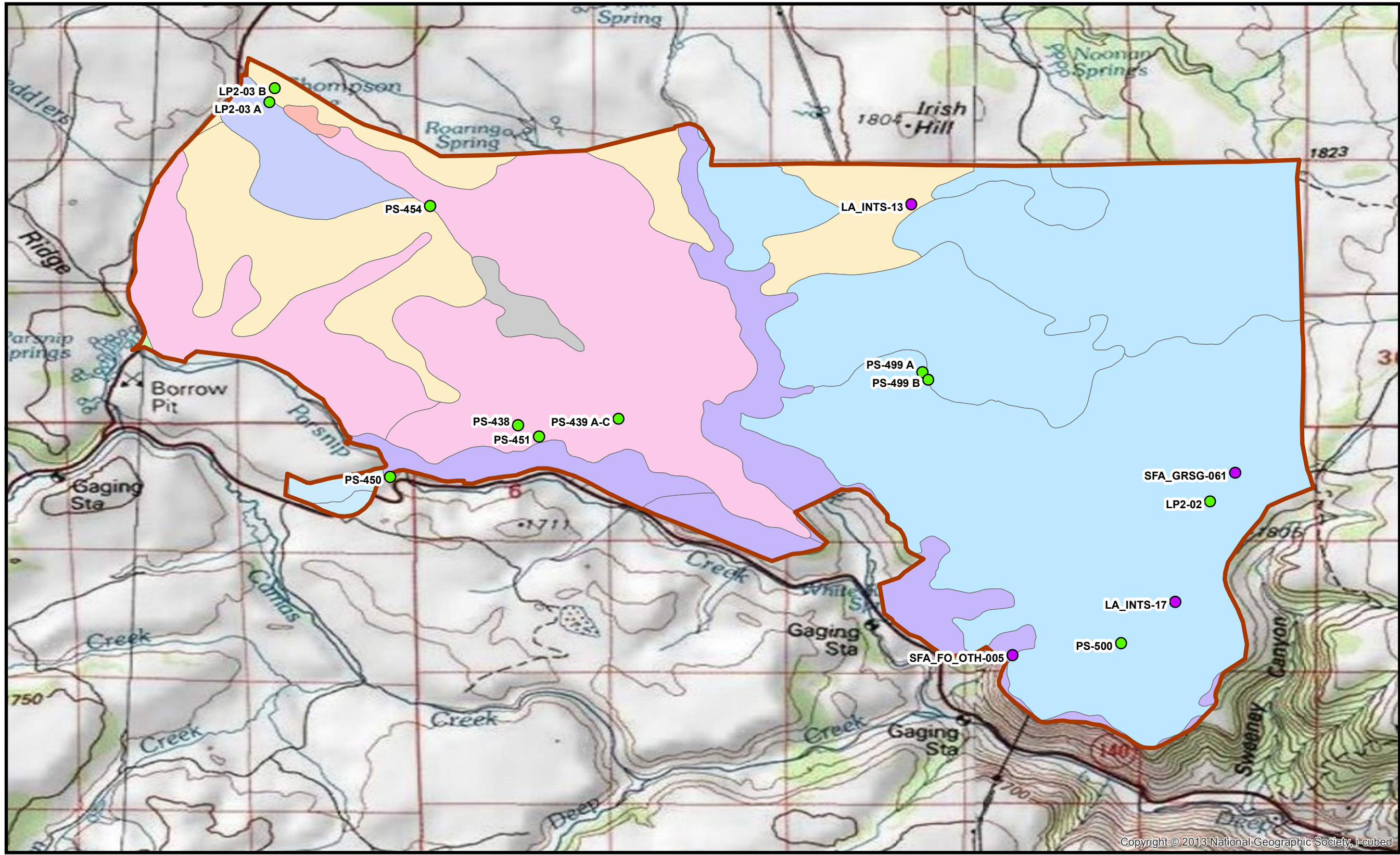
Lane Plan 2 Allotment
Map 2



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Legend

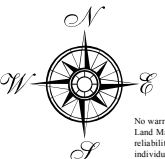
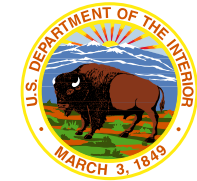
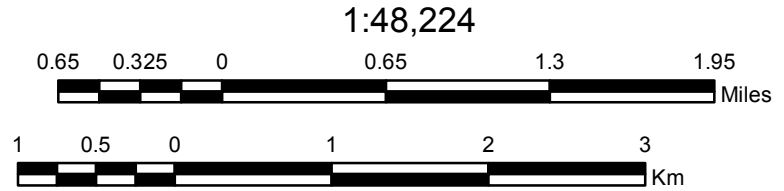
Soils

- Unknown
- CLAYPAN 12-16
- LOAMY 12-16
- PONDED CLAY
- SHALLOW LOAM 14-18
- SHALLOW STONY
- SOUTH SLOPES 12-16
- STONY CLAYPAN 14-18
- WET MEADOW

Monitoring Plots

- AIM plots
- Photo/Transect plots

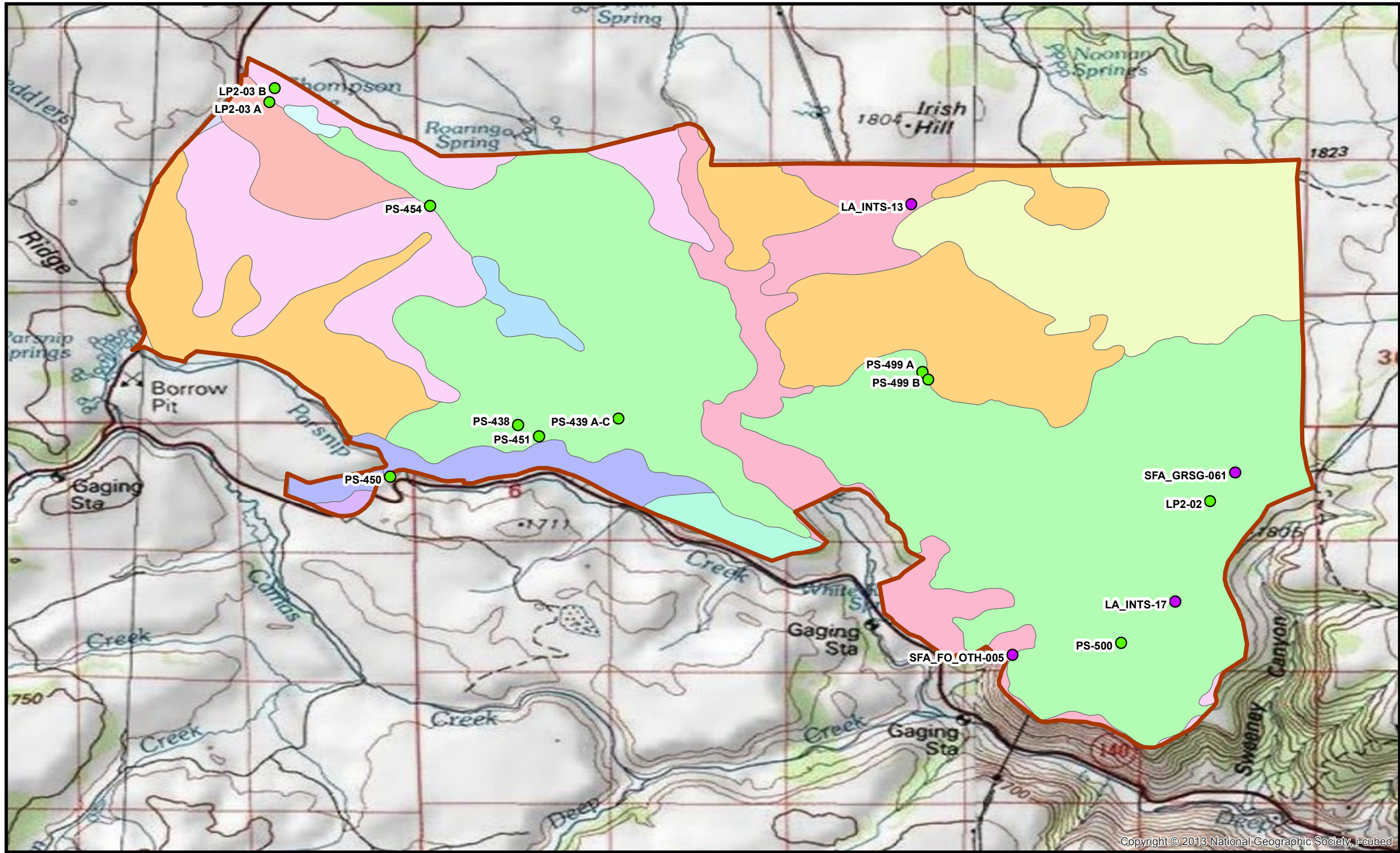
**Lane Plan 2 Allotment: Soils
Map 3**



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Legend

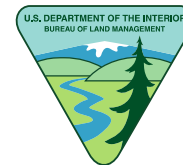
Dominant Vegetation

- AGCR
- ARAR8-FEID
- ARAR8-POSE
- ARAR8-ELEL5
- ARTRV-PSSPS
- ARTRV-ELEL5
- Incomplete
- JUOC-ARAR8-FEID
- JUOC-ARTRV-PSSPS
- JUOC-ARTRV-ELEL5
- JUOC-ARTRV-ACTH7
- POA
- Unknown

Monitoring Plots

- AIM plots
- Photo/Transect plots

**Lane Plan 2 Allotment: Dominant Vegetation
Map 4**

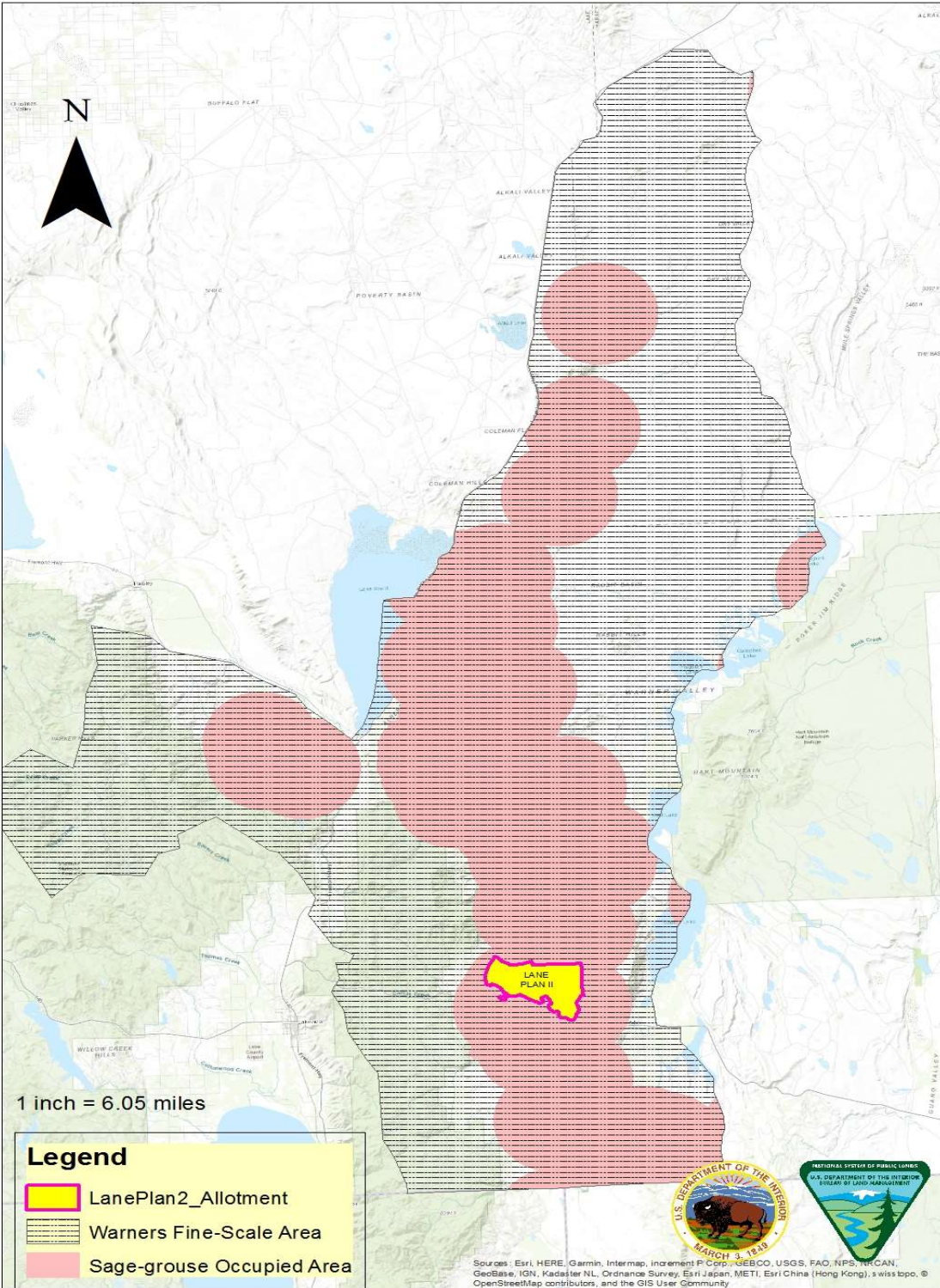


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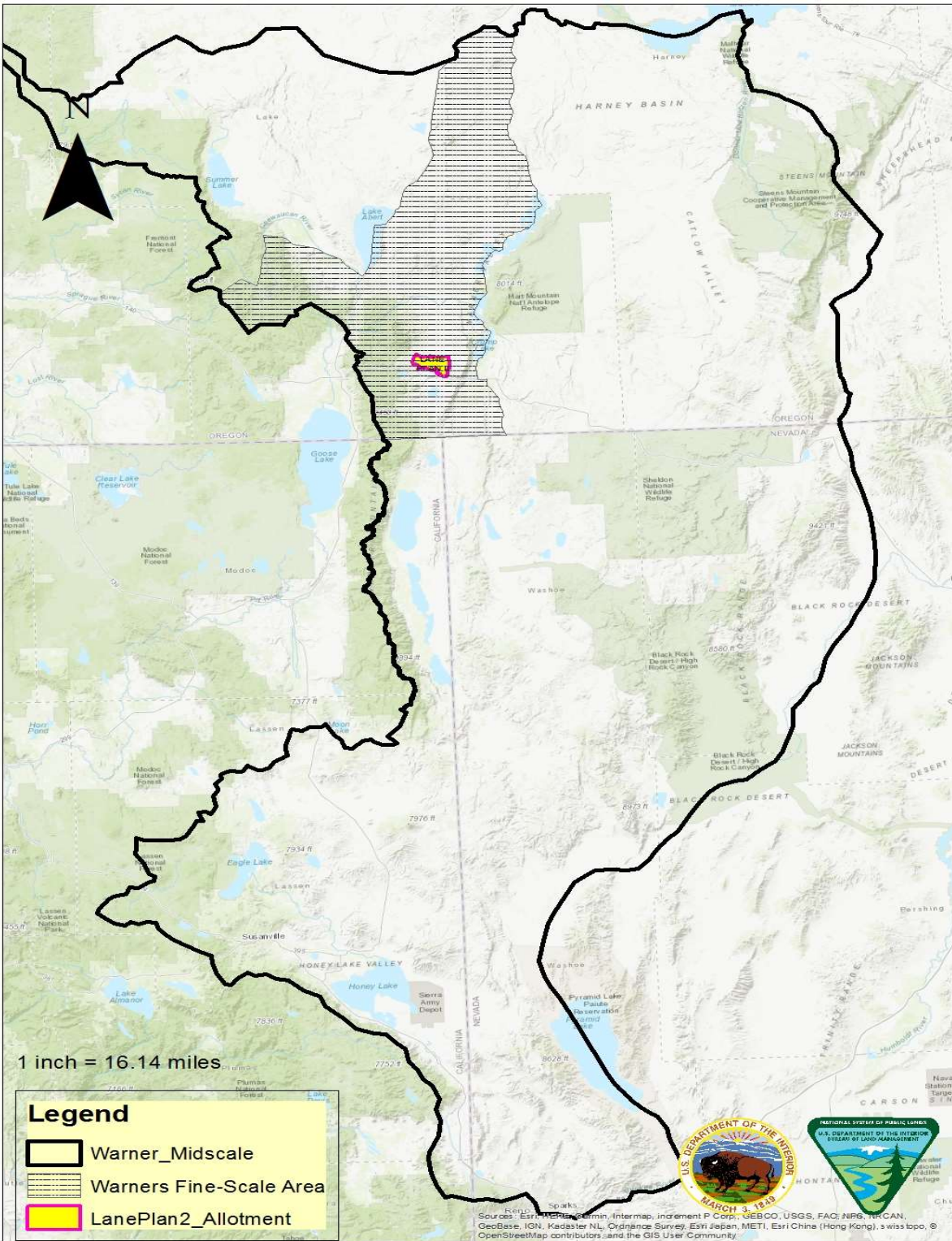


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Map 6. Greater Sage-Grouse habitat boundaries depicting the fine-scale, sage-grouse occupied habitat, and Lane Plan II Allotment.



Map 5. Greater Sage-Grouse habitat boundaries depicting the mid-and fine-scale and Lane Plan II Allotment.



Appendix A.

DETERMINATION OF EROSION CONDITION CLASS

Soil Surface Factors

SOIL MOVEMENT	No visible evidence of movement 0 1 2 3	Some Movement of soils particles 4 5	Moderate Movement of soil is visible and recent slight terracing generally less than 1" in height 6 7 8	Occurs with each event Soil and Debris deposited against minor obstructions 9 10 11	Subsoil exposed over much of area, may have embryonic dunes and wind scoured dunes 12 13 14
SURFACE LITTER	Accumulating in place 0 1 2 3	May show slight movement 4 5 6	Moderate movement is apparent, deposited against obstacles 7 8	Extreme movement apparent, large and numerous deposits against obstacles 9 10 11	Very little remaining (use care on low productive sites) 12 13 14
SURFACE ROCK	If present, the distribution of fragments show no movement caused by wind or water 0 1 2	If present, coarse fragments have a truncated appearance or spotty distribution caused by wind or water 3 4 5	If present, fragments have a poorly developed distribution pattern caused by wind or water 6 7 8	If present, surface rock or fragments exhibit some movement and accumulation of smaller fragments behind obstacles 9 10 11	If present, surface rock or fragments or dissected by rills and gullies or are already washed away 12 13 14
PEDESTALLING	No visible evidence of pedestalling 0 1 2 3	Slight pedestalling, in flow patterns 4 5 6	Small rock and plant pedestals occurring in flow patterns 7 8 9	Rocks and plants on pedestals generally evident, plant roots exposed 10 11 12	Most rocks and plants pedestalled and roots exposed 13 14 15
FLOW PATTERNS	No visible evidence of flow patterns 0 1 2 3	Deposition of particles may be in evidence 4 5 6	Well defined, small, and few with intermittent deposits 7 8 9	Flow patterns contain silt and sand deposits and alluvial fans 10 11 12	Flow patterns are numerous and readily noticeable. May have large barren fan deposits 13 14 15
RILLS	No visible evidence of rills 0 1 2 3	Some rills in evidence at infrequent intervals over 10' intervals 4 5 6	Rills 1/2" to 6" deep occur in exposed places at approximately 10' intervals 7 8 9	Rills 1/2" to 6" deep occur in exposed area at intervals of 5 to 10" 10 11 12	May be present at 3" to 6" deep at intervals less than 5' 13 14 15
GULLIES	May be present in stable condition. Vegetation on channel bed and side slopes 0 1 2 3	A few gullies in evidence which show little bed or slope erosion. Some vegetation present on slopes 4 5 6	Gullies are well developed with active erosion along less than 10% of their length. Some vegetation may be present 7 8 9	Gullies are numerous and well developed with active erosion along 10 - 50% of their lengths or a few well developed gullies with active erosion along more than 50% of their length 10 11 12	Sharply incised gullies cover most of the area and over 50% are actively eroding 13 14 15
SITUATION	TOTAL				

Erosion Condition Classes: Stable 0-20; Slight 21-40; Moderate 41-60; Critical 61-80; Severe 81-100

Appendix B.

OBSERVED APPARENT TREND

(Check appropriate box in each category which best fits area being observed)

VIGOR (10 Points)		Desirable grasses, forbs and shrubs are vigorous, showing good health. These plants should have good size, color and produce abundant herbage.
(6 Points)		Desirable grasses, forbs and shrubs have moderate vigor. They are medium size with fair color and producing moderate amounts of herbage, some seed stalks and seedheads are present.
(2 Points)		Desirable grasses, forbs and shrubs have low vigor. They appear unhealthy with small size and poor color. Portions of clumps or entire plants are dead or dying. Seed stalks and seedheads almost non-existent except in protected areas.
SEEDLINGS (10 Points)		There is seedling establishment of desirable grasses, forbs and shrubs. Seedlings are present in open spaces between plants and along edges of soil pedestals. Few seedlings of invader or undesirable plants are present.
(6 Points)		Some seedlings of desirable grasses, forbs and shrubs may or may not be present in open spaces between plants. Some seedlings of invader or undesirable plant species may or may not be present.
(2 Points)		Few if any seedlings of desirable grasses, forbs and shrubs are being established. Seedlings of invaders or undesirable should be present in open space between plants.
SURFACE LITTER (5 Points)		Surface litter is accumulating in place.
(3 Points)		Moderate movement of surface litter is apparent and deposited against obstacles.
(1 Point)		Very little surface litter is remaining.
PEDESTALS (5 Points)		There is little visual evidence of pedestalling. Those pedestals are sloping or rounding and accumulating litter. Desirable forage grasses may be found along edges of pedestals.
(3 Points)		Moderate plant pedestalling. No visual evidence of healing or deterioration. Small rock and plant pedestals may be occurring in flow patterns.
(1 Point)		Most rocks and plants are pedestalled. Pedestals are sharply sided and eroding often exposing grass roots.
GULLIES (5 Points)		Gullies may be present in stable condition with moderate sloping or rounded sides. Perennials should be establishing themselves on bottom and sides of channel.
(3 Points)		Gullies are well developed with small amounts of active erosion. Some vegetation may be present.
(1 Point)		Sharply incised V-shaped gullies cover most of the area with most of the gullies actively eroding. Gullies are mostly devoid of perennial plants with fresh cutting of the bottom.

TOTAL POINTS _____ Rating 26-35-Upward; 17-25-Static; 7-16-Downward