

*Appendix G: Management Unit Supplement to Greater Sage-grouse Habitat
Summary Report*

**Management Unit Supplement
To
Greater Sage-Grouse
(*Centrocercus urophasianus*)
Habitat Summary Report**

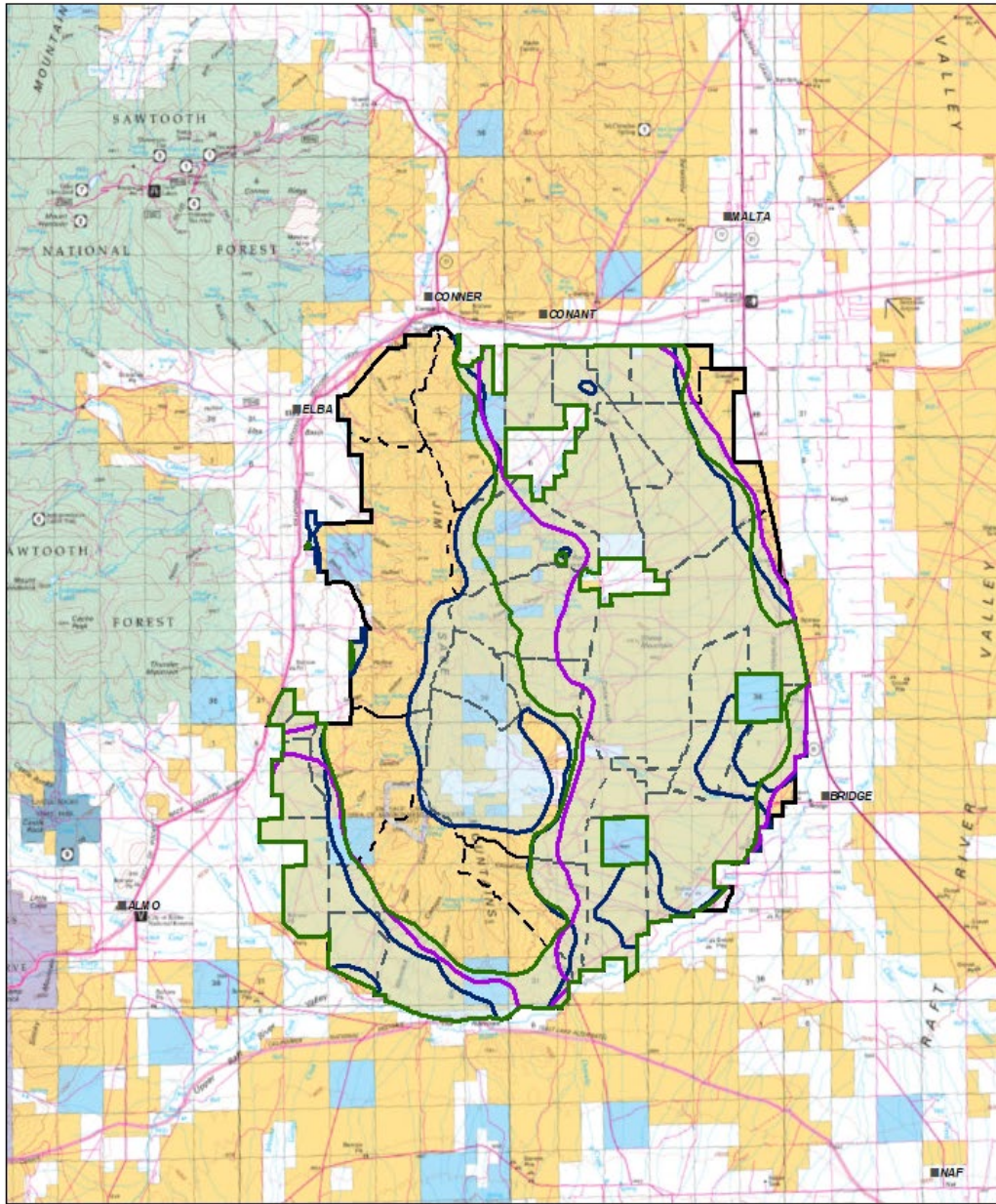
**Jim Sage Allotment
Burley Field Office/Idaho
February 2021**



Executive Summary

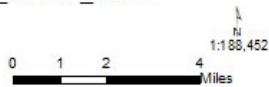
This report provides a habitat assessment for Greater sage-grouse seasonal habitat within the Jim Sage Allotment based on the site-scale methods described in the Sage-grouse Habitat Assessment Framework ([HAF](#)) ([Stiver et al. 2015](#), [BLM Technical Reference 6710-1](#)). The Jim Sage Allotment is located within Idaho, overlaps with the Northern Great Basin population, includes 55,880 acres of Important Habitat Management Area (IHMA) and 24,160 acres of General Habitat Management Area (GHMA). The Jim Sage Allotment has no designation of Priority Habitat Management Area. Within IHMA and GHMA modeled sage-grouse habitat occurs within three mostly overlapping Seasonal Habitat Areas (SUAs) on Jim Sage. These SUAs include approximately 46,300 acres of nesting/early brood-rearing, 50,260 acres of late brood-rearing/summer, and 41,030 acres of winter. These SUAs are expected to support sage-grouse through their specific life cycle timeframes on Jim Sage. The assessment area occurs within the HAF Snake River Valley Mid-Scale (2nd order) and Upper Raft River Fine-Scale (3rd order).

Sage-grouse Combined Seasonal Use Areas



- ▭ Jim_Sage_Spring_SUA
- ▭ Jim_Sage_Summer_SUA
- ▭ Jim_Sage_Winter_SUA

Date: 2/25/2021



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Figure 1: The location and extent of the Jim Sage Allotment and the sage-grouse seasonal use areas within it.

The following HAF Summary Reports are referenced throughout this document:

- Snake River Valley Mid-Scale HAF Summary Report ([February 2021])
- Upper Raft River Fine-Scale HAF Summary Report ([February 2021]).
- Site-scale HAF Summary Report for the Upper Raft River Fine-Scale [February 2021]).

Habitat assessments from these larger areas (i.e., HAF mid-, fine- and site-scales) provide meaningful information, such as landscape context, for the Jim Sage Allotment habitat assessment.

The purpose, methods and results of this habitat assessment are described in detail throughout this document. In brief, the assessment found the following for the Jim Sage Allotment:

- **Lekking Habitat** was rated as Suitable for Greater Sage-grouse, primarily due to the absence of detrimental land uses and tall structures throughout the allotment. Of the 11 lek sites, 9 were within suitable habitat. Two leks were rated as marginal due to the presence of tall structures at one site and the absence of suitable sagebrush cover at the other. The Jim Sage Allotment is relatively contiguous habitat through the middle of the allotment with large fires on the north and south side of the mountain. Leks within Jim Sage are mostly found in the continuous habitat in the middle of the allotment.
- **Nesting/Early Brood Rearing Habitat** was rated as Marginal for Greater Sage-grouse, primarily due to unsuitable habitat in some sites historically seeded with crested wheatgrass or Russian wildrye, sites that are recently burned areas and sites within Wyoming/greasewood ecological sites. Although most of these sites had suitable perennial grass cover, these sites lacked the potential to meet sage-grouse nesting habitat suitability primarily due to lack of shrubs and preferred forb diversity. In some of the historic seedings and the recently burned areas the continued establishment of sagebrush in the unsuitable sites will increase the probability the nesting/early brood-rearing habitat on Jim Sage reaches suitability.
- **Upland Summer/Late Brood-Rearing Habitat** was rated as Suitable for Greater Sage-grouse, primarily due to a high diversity of plant species in the upper elevations. These sites also offer sage-grouse suitable cover throughout the summer season. In contrast, most of lower elevation sites were rated as marginal or unsuitable due to the absence of forb diversity. These sites receive lower amounts of precipitation throughout the year and forbs would be expected to dry and not be available through the upland summer/late-brood rearing season.
- **Riparian Summer/Late Brood-Rearing Habitat** was rated as Suitable for Greater Sage-grouse, primarily due to all 9 sites being rated as suitable for PFC and for preferred forb availability. Although, four sites did not meet the threshold for nearby sagebrush cover due to sagebrush removal by the 2018 Connor Fire, the riparian conditions at these sites had recovered post fire.
- **Winter Habitat** was rated as Marginal for Greater Sage-grouse, primarily due to the absence of suitable sagebrush cover in some historic crested seedings, recently burned areas and Wyoming big sagebrush/greasewood ecological sites. However, winter habitat

suitability varied across Jim Sage and overall winter suitability is trending upwards. The continued establishment of sagebrush in the unsuitable sites will increase the probability the winter habitat on Jim Sage reaches suitability.

Site-scale suitability ratings for plots (sample locations) within each seasonal use area are summarized in Table 1 below.

Table 1: Site-Scale Plot Suitability Summary

Site-scale Habitat Type	# of Sample Locations	Suitability Estimate (within 10% CI)		
		Suitable	Marginal	Unsuitable
Proportional Analyses		Proportional Area %		
Breeding Habitat (Nesting/Early Brood Rearing) (Form S-3)	44	31.7%	25.0%	43.3%
Upland Summer/Late Brood-Rearing Habitat (Form S-4)	15	41.1%	21.5%	37.4%
Winter Habitat (Form S-6)	48	55.5%	11.8%	32.7%
Plot-counting Analyses		Percent of Plots		
Breeding Habitat (Leks) (Form S-2)	11	82%	18%	0%
Riparian Summer/Late Brood-Rearing Habitat (Form S-5)	9	100%	0%	0%

The findings of this assessment, in addition to the underlying data and knowledge documented in this report, can be used to inform management decisions related to sage-grouse habitat within the respective area. For example, this assessment can be referenced in a land health standards report when evaluating the wildlife/special status species habitat quality standards(s) specific ([BLM Handbook 4180-1, Land Health Standards](#)). It can also be used in applicable National Environmental Policy Act (NEPA) analyses and reporting for project planning.

This assessment was led by the BLM Burley Field Office and Idaho State Office and was conducted in coordination with BLM partners, including Idaho Department of Fish and Game. Note that habitat assessments may be periodically updated as new data, analyses, and other information become available.

Background

Sage-grouse habitat suitability was assessed within the Jim Sage Allotment using the methods for site-scale (4th order) habitat selection as described in the Sage-Grouse Habitat Assessment Framework (HAF) (Stiver 2015). Note that this report is not a HAF Site-scale Summary Report as the assessment is limited to the boundaries of a management unit (as opposed to a HAF site-scale boundary). Instead, this report can be considered a Management Unit Supplement to a HAF Summary Report as it provides an additional scale of habitat assessment that can be used to inform management decisions. Likewise, HAF Summary Reports for mid-, fine-, and/or site-scales can be used when completing a Management Unit Supplement to provide important information on landscape context. These two types of sage-grouse habitat assessments (Management Units Supplements and HAF Summary Reports) are complementary products and should be used in conjunction whenever appropriate.

1.1 Habitat Assessment Area

The Jim Sage Allotment is located due east of Elba and Almo, Idaho (See Figure 1). The allotment is comprised of approximately 75,521 acres of public land, 4,120 acres of State of Idaho Lands and 2,172 acres of private lands.

Elevations range from 4,600 feet on the eastern edge to just over 8,000 feet on the highest mountain peak. Vegetation is dominated by sagebrush types with significant areas of juniper and native grasses. Several crested wheatgrass seedings and native cultivar seedings occur across the allotment. There are 11 miles of stream in the allotment comprising approximately 40 acres of riparian vegetation.

Unique characteristics include an 11,227-acre special recreation management area occurring at and above the 6,600-foot elevation benchmark emphasizing primitive recreation such as hiking and horseback riding. Partially included in this area is the Jim Sage Research Natural Area/Area of Critical Environmental Concern (RNA/ACEC), which was allotted to preserve the relic Pinyon-Juniper plant community. It is comprised of 620 acres and contains Jim Sage Spring. The RNA is in Jim Sage Canyon on the south end of the allotment.

Vegetation in the allotment is diverse. Lower elevation sites range from greasewood and shadscale to Wyoming big sagebrush. Understory vegetation in these areas contain varying levels of bluebunch wheatgrass, squirreltail and Sandberg's bluegrass and cheatgrass. Globemallow is the primary forb in these lower elevation sites. In the mid to upper elevation areas, Utah juniper, single leaf pinyon, low, black and mountain sage, aspen, mountain brush and mahogany communities dominate. Douglas fir occupies a small amount of acreage in the upper end of Parks Creek.

The Jim Sage Allotment provides habitat for a variety of wildlife species. There are no Threatened or Endangered (T&E) species or associated critical habitats. Several BLM-designated Sensitive bird and animal species occur or potentially occur in the allotment. The Jim Sage Allotment area also provides year-round habitat for sage-grouse.

Jim Sage Allotment Area

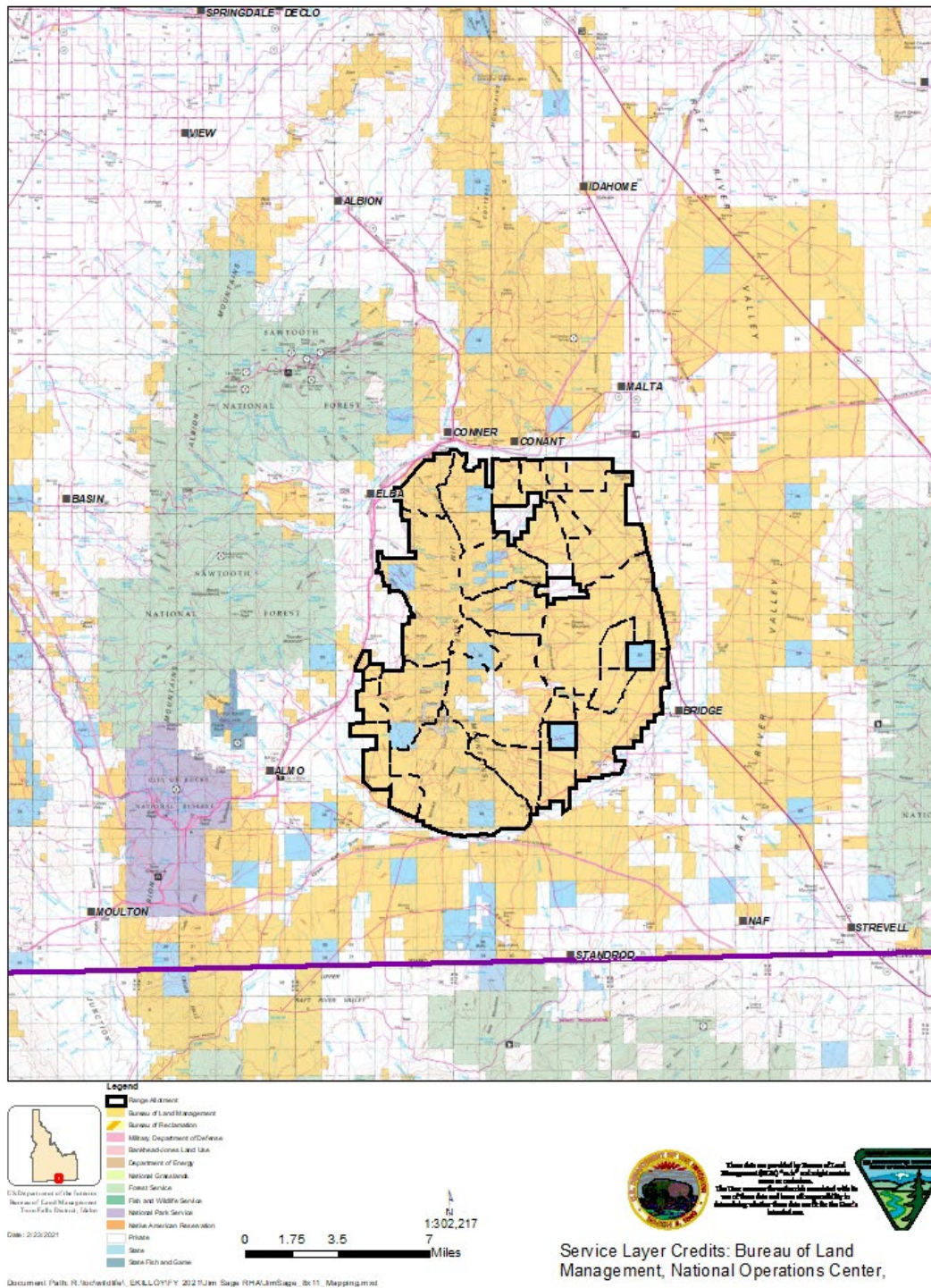
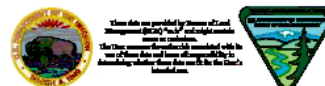
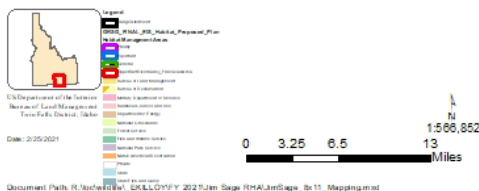
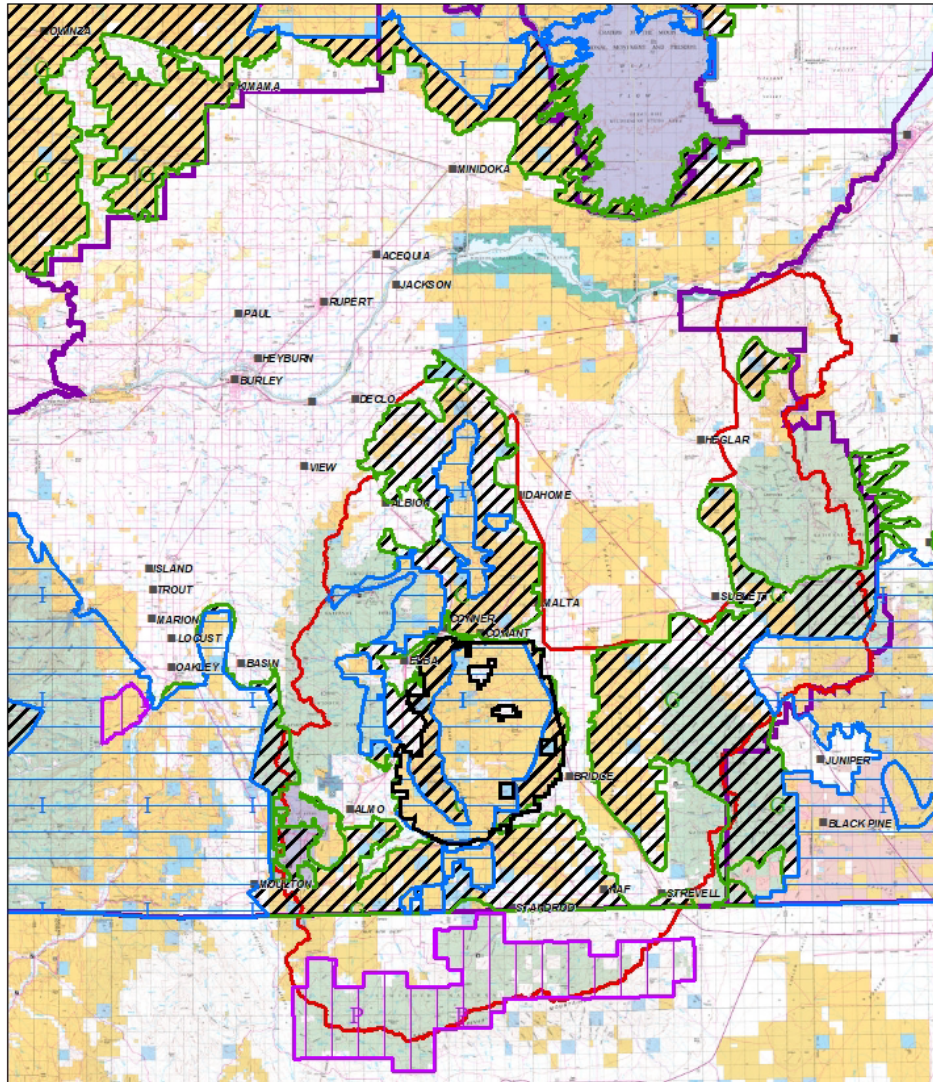


Figure 2. Map showing the location of the Jim Sage Allotment and BLM administrative units.

1.2 Purpose of the Habitat Assessment

This habitat assessment and its associated HAF summary reports will inform the Rangeland Health Assessment and Evaluation report and subsequent livestock grazing permit renewal Environmental Assessment and grazing decisions for the Jim Sage Allotment. This area occurs Upper Raft River Fine-Scale Management boundary for sage-grouse and overlaps with sage-grouse IHMA, GHMA and delineated Seasonal Use Areas (Figure 2).

Habitat Management Areas on Jim Sage Allotment



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Figure 3. Map showing the Jim Sage Allotment in relation to sage-grouse Upper Raft River Fine-Scale Management Boundary.

2.0 Methods

Following the methods of the HAF, site-scale (plot) data that occur within sage-grouse seasonal use areas (SUAs) (e.g., nesting/early brood-rearing) were evaluated by comparing habitat indicators (e.g., perennial grass height) at each plot against habitat suitability thresholds (e.g., $\geq 18\text{cm}$ is suitable, 10 to $< 18\text{cm}$ is marginal, or $< 10\text{cm}$ is unsuitable). These plot-based suitability ratings were then summarized and statistically analyzed to rate the overall suitability of each SUA within with management unit. Details on the specific data and analysis methods for this assessment are described below.

2.1 Data Sources

Assessing large landscapes and maintaining consistency in analyses across the sage-grouse range and scales of assessment requires the use of both regional and local geospatial data. Table 1 provides the name and source of the geospatial data used in this assessment.

Table 2: Data sources used in the habitat assessment.

Data Name	Source
Fine-Scale Boundaries	BLM HAF Westwide database
Sage-grouse Lek Locations	Idaho Department of Fish and Game
Sage-grouse Seasonal Habitat	BLM Idaho State Office Name/ Idaho Department of Fish and Game
NLCD Shrubland Sagebrush Cover	US Geological Survey
Anthropogenic Features	BLM NOC Disturbance Compilation 2020
Tall Structures (Meteorological and Communication Towers)	BLM NOC Disturbance Compilation 2020
Tree Canopy Cover	Sage-Grouse Initiative (Falkowski et al. 2017)
National Elevation Data	U.S. Geological Survey. DOI, BLM, NOC, Geospatial Section OC-534
Assessment, Inventory and Monitoring (AIM) Plots	BLM NOC TerrADat database
Landscape Monitoring Framework (LMF) Plots	NRCS/ BLM NOC TerraDat database
Modified Assessment, Inventory and Monitoring (AIM) Plots	BLM Burley Field Office and BLM NOC TerrADat database
Proper Functioning Condition (PFC)	BLM PFC database

Data Name	Source
Ecological Site Descriptions	NRCS
Interpreting Indicators of Rangeland Health	BLM Technical Reference 1734-6 Version 5

Sage-grouse habitat was assessed using field (plot) data collected through the BLM Assessment Inventory and Monitoring (AIM) strategy the Landscape Monitoring Framework (LMF) (Toevs 2011), and Modified Assessment Inventory and Monitoring (M-AIM). AIM, LMF, and M-AIM plots are part of a spatially balanced sample design where monitoring information is gathered within a landscape of interest at predetermined locations randomly identified during the design stage. During the randomization process, every possible location has a chance of being selected, which enables reporting on the condition and trend of all monitored renewable resources within an area of interest with known levels of precision and accuracy. Plot data that were both spatially and temporally valid (i.e., occurred within mapped SUAs and were collected during the appropriate time period) were used in this analysis to inform suitability of Nesting/Early Brood-Rearing (form S-3), Upland Summer/Late Brood-Rearing (form S-4), and Winter (S-6) seasonal habitats.

Interpreting Indicators of Rangeland Health (IIRH) indicators (i.e., ground cover, soil movement, plant vigor) were used to evaluate soil and watershed stability, assess vegetative health and the functionality for ecological processes at 16 upland sites within sage-grouse SUAs in 2019. Rangeland health indicators fall into three main attributes: soil and site stability, hydrologic function and biotic integrity. In 2019, site evaluations were completed at or near the original sites with a few new sites being assessed. Data were collected on-site based on ecological site and land history. Sites were identified to represent the conditions of the soils and vegetation within the pasture(s) or use area. Data were collected both quantitatively and qualitatively. An ID team consisting of specialists in plant identification, range management, wildlife biology, plant ecology and riparian assessments collaborated on data collection and field evaluations. At each site, the team conducted cover transects to determine plant community composition by percent cover, verified the ecological site, completed field forms and photographed the site and surrounding area. The site conditions were compared to the ecological site descriptions from the Natural Resource Conservation Service (NRCS).

2.1.1 Sample Design

I. Sample Design: Modified-AIM

The Jim Sage Allotment was stratified utilizing a computer-generated spatially balanced random point selector, the Shiny Spatially Balanced Sampling Tool, and were distributed between Recently Burned, Seedings, and Potential Native Plant Community (SSURGO) layers within each of the three SUAs for sage-grouse (i.e., nesting/early brood-rearing, summer/late-brood rearing and winter). Stratification of plots were bound to the Spring (Nesting/Early Brood-rearing) and Summer (Late Brood-rearing) areas. The two SUAs were overlapped to a merged stratification area; the sites in the Spring habitat were completed before June 30. The sites that

were only in the Summer SUA were completed in their time range (July-October). The site-scale assessments evaluated suitability of seasonal habitat using a suite of habitat indicators that apply to each SUA. Suitability of seasonal habitats, including leks, were assessed using the methods described in the Modified HAF Technical Reference (BLM 2015; [\[Jim Sage S-Forms\]](#)).

In 2019, 54 M-AIM plots were stratified on Jim Sage. The Modified AIM protocol measures habitat indicators which are consistent with those listed in Table 2-2, Habitat Objectives for GRSG, of the ARMPA (BLM 2015a). All sampled plots have been included in the Upper Raft River Fine-Scale Analysis.

Table 3. Ecological Site Crosswalk to Ecological Site Group

Ecological Site Name	Ecological Site Group
ALKALI FLATS 8-12 SAVE4/ELEL5	ALKALI FLATS 8-12 SAVE4/ELEL5
LOAMY 8-12 ARTRW8/PSSPS	LOAMY 8-12 ARTRW8/PSSPS
SHALLOW CALCAREOUS LOAM 10-16 ARARN/PSSPS	SHALLOW CALCAREOUS LOAM 10-16 ARARN/PSSPS
SHALLOW LOAMY 8-12 ARAR8/PSSPS	SHALLOW LOAMY 8-12 ARAR8/PSSPS
SHALLOW STONY 12-20 ARAR8/PSSPS	SHALLOW STONY 12-20 ARAR8/PSSPS
NORTH SLOPE STONY 12-16 ARTRV/FEID	Stony 12-16 ARTRV/FEID
STEEP SOUTH 16-22 ARTRV/PSSPS	
STEEP SOUTH SLOPES 12-16 ARTRV/PSSPS	
GIS Historical Fire Layer	Recently Burned
Completed Historic Vegetation Treatments	Seeding

Table 4. (terrestrial). Summary of ecological site groups (strata). The number of sites per strata was determined by management priorities in the BFO; number of plots per ecological site group was based on percentage of the total study area.

Strata – Eco-site Groups	Approx. stratum acres	Proportional area	Sites per strata (2019)
ALKALI FLATS 8-12 SAVE4/ELEL5	3,820	8%	Primary: 5 Oversample: 2
LOAMY 8-12 ARTRW8/PSSPS	4,960	10%	Primary: 6 Oversample: 2

Strata – Eco-site Groups	Approx. stratum acres	Proportional area	Sites per strata (2019)
SHALLOW CALCAREOUS LOAM 10-16 ARARN/PSSPS	5,586	11%	Primary: 7 Oversample: 2
SHALLOW LOAMY 8-12 ARAR8/PSSPS	4,998	10%	Primary: 6 Oversample: 2
SHALLOW STONY 12-20 ARAR8/PSSPS	3,409	7%	Primary: 7 Oversample: 2
STONY 12-16 ARTRV/FEID	3,153	6%	Primary: 6 Oversample: 2
Recently Burned	10,170	21%	Primary: 8 Oversample: 4
Seeding	13,126	27%	Primary: 15 Oversample: 6
<i>Total</i>	49,222	100%	Primary: 60 Oversample: 22

Modified AIM 2019

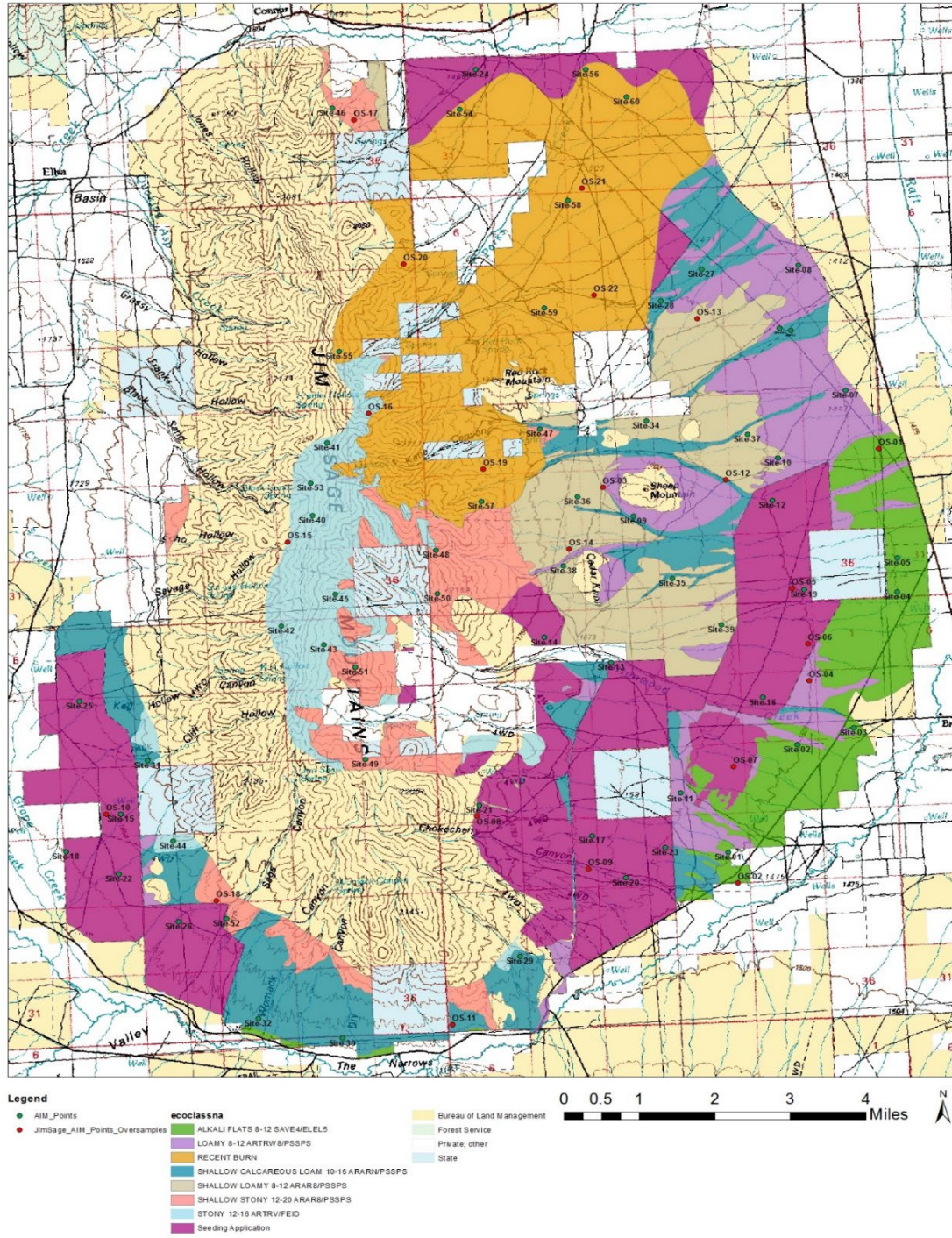


Figure 4. Map of 2019 Modified HAF random points and ecological group strata percentages.

II. Sample Design: AIM

In 2019 and 2020, the BFO focused terrestrial AIM data collection outside of the sagebrush focal area, where AIM data were collected in 2016-2017. Monitoring objectives in 2019 and 2020 were to establish AIM points in upland vegetation across the BFO and to collect data that would supplement existing HAF data, long-term trend data and fuels data across the FO, and be used for rangeland health assessments, HAF assessments and grazing permit renewals. The intent was to incorporate revisits of plots in the sagebrush focal areas starting in 2021. Balance of sample points across the field office in 2021 and beyond will depend upon the results of the habitat assessment process for the SFA, which is currently being conducted.

Jim Sage AIM points were stratified along with points within a larger study area. The study area was stratified by reviewing the SSURGO-based ecological site mapping, which reflects the dominant condition within each soil map unit. The ecological sites are grouped based on similar characteristics. Some re-categorization of ecosite polygons was done post-hoc based on knowledge of soils and plant communities by the field office staff (e.g. areas mapped as low sage that FO staff knew were actually dominated by big sage, were recategorized to the appropriate stratum). In 2019, 4 AIM plots were distributed across six, final strata: Big Sagebrush Cool Moist (BigCM), Big Sagebrush Warm Dry (BigWD), Low Sagebrush Cool Moist (LowCM), Low Sagebrush Warm Dry (LowWD), Salt Desert Mix (SD), and Other.

The geospatial data layers used to define the study area and reporting units include:

- BLM field office boundaries
- BLM land ownership
- Ecological site maps derived from NRCS SSURGO soils maps

III. Sample Design: LMF

The National Landscape Monitoring Framework Data collection protocol is part of the National Resources Inventory (NRI). NRI is a natural resource inventory conducted by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). It provides updated information on the status, condition, and trends of land, soil, water, and related resources on the Nation's non-federal lands. Non-Federal lands include privately owned lands, tribal and trust lands, and lands controlled by State and local governments. NRI provides nationally consistent data and is comparable with AIM data (i.e. plot data are statistically valid and are part of a spatially balanced random sample design). Statistical estimation and quality assurance procedures employed for the NRI survey program help ensure that trends reported using NRI data reflect true changes in resource conditions.

The NRI was designed to establish a database that would allow natural resource issues to be analyzed by portions of Major Land Resource Areas (MLRAs) within States. The NRI sample was selected on a county-by-county basis, using a stratified, two-stage, area sampling scheme. The two-stage sampling units are (1) nominally square segments of land, and (2) points within the segments. The segments are typically half-mile-square parcels of land equivalent to 160-acre quarter-sections in the Public Land Survey System. An annual or continuous approach was

initiated in 2000. This approach provides efficiencies in conducting the survey and balancing of resources, and also makes it easier for the NRI to respond to newly emerging resource issues, and a *core panel* of about 40,000 segments is observed each year along with a different supplemental or rotation panel selected for each year. These panels are selected using stratification based upon geographical factors and historical data; for example, segments containing wetlands or land enrolled in the USDA Conservation Reserve Program (CRP) have a significantly higher chance of selection than those classified historically as forest land. Within the Jim Sage Allotment 11 plots were completed using the LMF from 2011-2018.

2.2 Analysis

Assessments evaluate suitability of seasonal habitat using a suite of habitat indicators that apply to each SUA.

These field data include measurements of site-scale indicators of habitat suitability (such as percent sagebrush, sagebrush height, number of preferred forbs, etc.). Data were filtered before analysis by date of field collection to correspond to the season-specific indicators being assessed, including lekking, nesting/early brood-rearing/upland summer/late brood-rearing/riparian/late brood-rearing/winter.

Suitability of seasonal habitats, including leks, were assessed using the methods described in the HAF TR (BLM 2015; [\[link to your S forms\]](#)). Specifically, AIM plot data from 2019, LMF data from 2011-2018, M-AIM data from 2019 and targeted IIRH site data from 2019.

Each plot/data point was rated as suitable, marginal or unsuitable by comparing each indicator's measurement (e.g., 5% sagebrush) against the benchmark for suitability for the specified season (e.g., suitable = 15 to 25% sagebrush, marginal = 5% to <15% or >25% sagebrush, unsuitable = <5% sagebrush). After rating all of the data for each season, they were analyzed by plot counting and area-weighted analysis.

3.0 Results

Site-scale habitat suitability is divided into five categories based on the season and type of use. These include:

6. Breeding Habitat: Leks
7. Breeding Habitat: Nesting/Early Brood-Rearing
8. Upland Summer: Late Brood-Rearing
9. Riparian Summer: Late Brood-Rearing
10. Winter Habitat

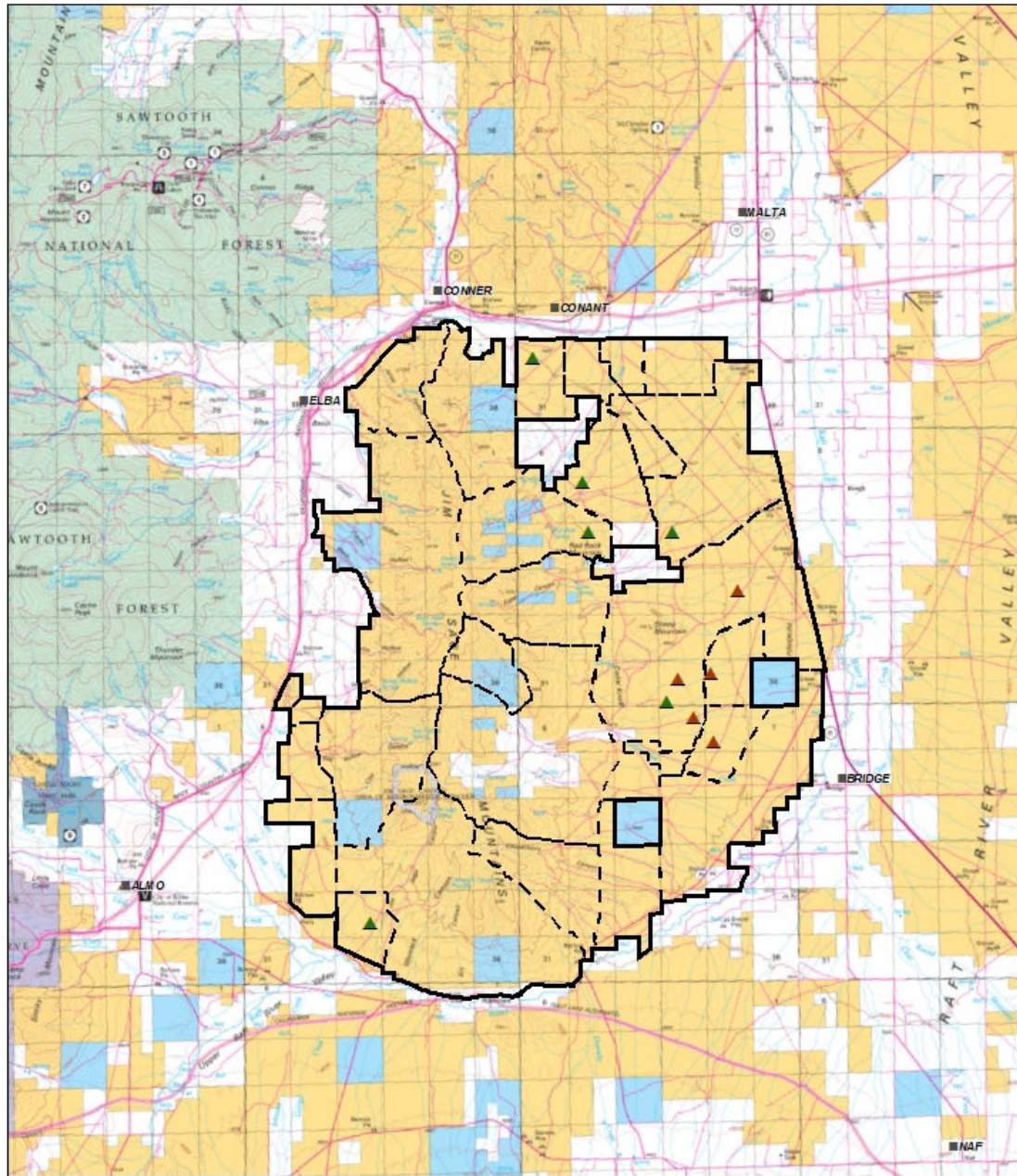
3.1 Breeding Habitat (Leks): HAF Form S-2


The suitability of active, occupied, unoccupied, undetermined status leks contained in the IDFG database (as of November 18, 2020 within Jim Sage was assessed using GIS aerial imagery and BLM Rights of Way layers. Eleven leks were evaluated throughout the allotments on BLM land (Figure 2). The GIS/NAIP imagery assessment to determine suitability consisted of the indicators described in Table 5.

Table 5: Indicators for lek site suitability

Habitat Indicator	Suitable	Marginal	Unsuitable
Availability of Sagebrush Cover.	Lek has adjacent protective sagebrush cover within 100m.	Sagebrush cover within 100m provide very little protective cover.	Adjacent sagebrush cover is more than 100m.
Proximity of Detrimental Land Uses.	Detrimental land uses are not within line of sight and absent to uncommon within 3km of the lek.	Detrimental land uses are within line of sight and uncommon or few within 3km of lek.	Detrimental land uses are within the vicinity of the lek site.
Proximity of Trees or Other Tall Structures.	Trees or other tall structures are not within line of sight and none to uncommon within 3km of the lek.	Trees or other tall structures are within line of sight and uncommon or scattered within 3km of lek.	Trees or other tall structure are within the vicinity of the lek site.

Jim Sage Lek Locations




IFWIS Sage grouse Leks (Internal Use Only)
Mgmt Status
▲ Active
■ Occupied
▲ Unoccupied
■ Undetermined
▲ Not verified

Date: 2/23/2021



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Figure 5. Jim Sage lek locations

CHART 1: LEK SUITABILITY WITHIN THE JIM SAGE ALLOTMENT

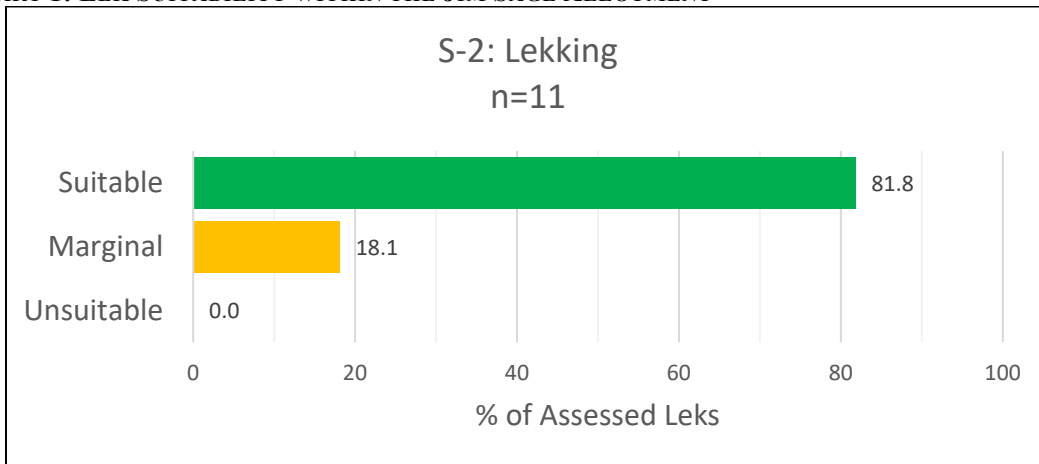
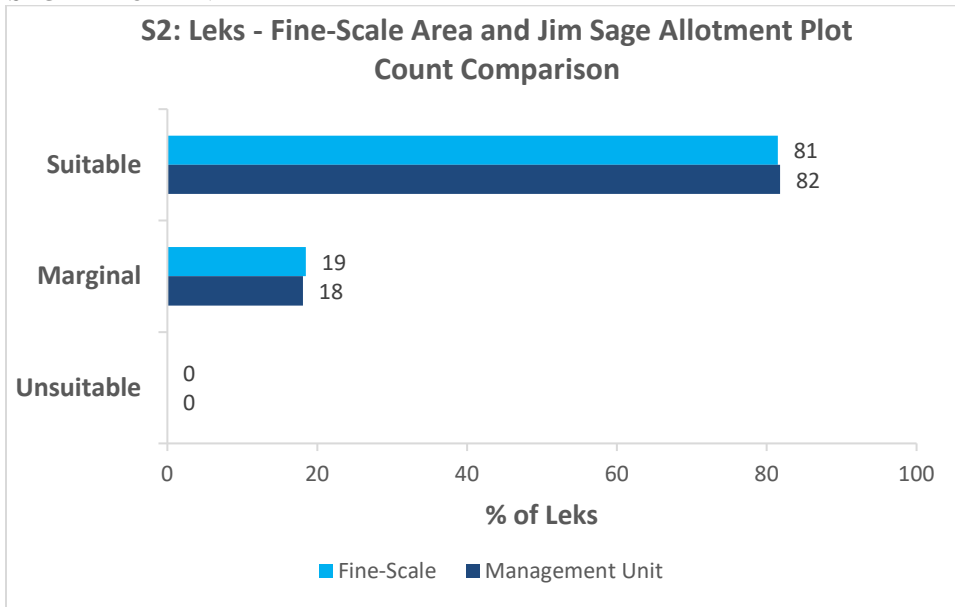


TABLE 6: LEK SUITABILITY BY INDICATOR. ANALYSIS BY PLOT COUNT ON THE LEFT SIDE OF THE GRAPH, PROPORTION OF PLOTS MEETING SUITABILITY ON THE RIGHT.

S2 Indicators (n=11)	# of Plots			% of Plots		
	Proximity of Sagebrush to Leks	Absence of Trees	Absence of Detrimental Land Uses	Proximity of Sagebrush to Leks	Absence of Trees	Absence of Detrimental Land Uses
Suitable	10	10	10	90.9	90.9	90.9
Marginal	0	1	1	0.0	9.1	9.1
Unsuitable	1	0	0	9.1	0.0	0.0

CHART 2: PLOT COUNT COMPARISON OF LEKS BETWEEN THE UPPER RAFT RIVER FINE SCALE AND THE JIM SAGE ALLOTMENT



Breeding Habitat (Leks): Summary

Plot Counting Data

Habitat suitability indicators for lekking habitat are described in Table 5 above. Of the 11 lek sites, 9 (~82%) were within suitable habitat (Table 6). One lek was rated as marginal due to the proximity of powerlines which may provide perching opportunities for raptors. The other lek site was rated as marginal due to the absence of suitable sagebrush cover adjacent to the site. Chart 2 shows the comparison of plot counting percentages for lek habitat suitability between the Jim Sage allotment and the Upper Raft River Fine-Scale Area.

3.2 Breeding Habitat (Nesting/ Early Brood-Rearing): HAF Form S-3

Nesting/early brood rearing SUA was assessed by the IDT, with data collected from AIM, and LMF and Modified AIM plots. Nesting/early brood-rearing suitability is based on sagebrush attributes of cover, height, and shape, perennial grass cover and height, perennial forb cover, height, and preferred forb availability (Table 3). The suitability rating is based on professional judgment guided by the indicators.

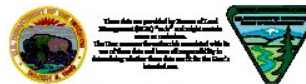
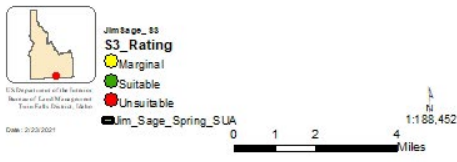
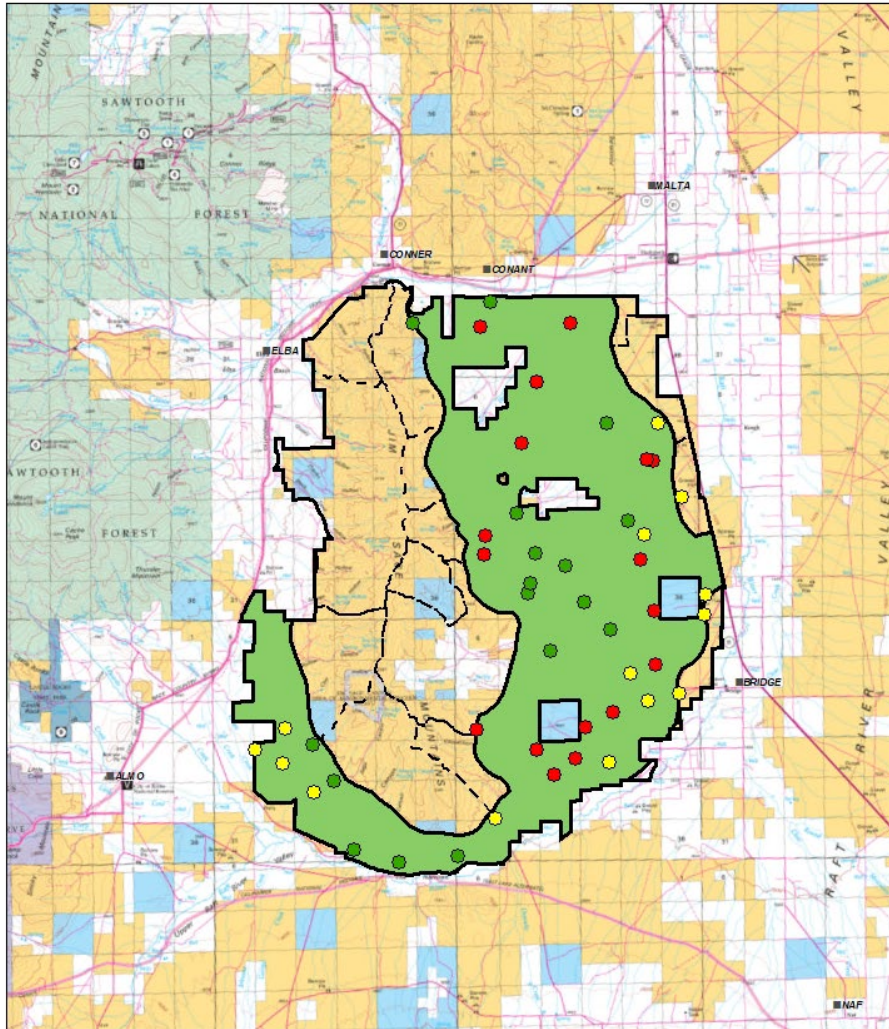
Table 3: Parameters for nesting/early brood rearing habitat suitability

Habitat Indicator	Suitable	Marginal	Unsuitable
Sagebrush Canopy Cover (mean)	15 to 25%	5 to <15% or >25%	<5 %
Sagebrush Height (mean)			
Mesic Site	40 to 80 cm	20 to <40 or >80 cm	<20 cm
Arid Site	30 to 80 cm	20 to <30 or >80 cm	<20 cm
Predominant Sagebrush Shape (mode)	Spreading (spread)	Mix of spreading (spread) and columnar (col)	Columnar (col)
Perennial Grass Height (mean)	≥18 cm	10 to <18 cm	<10 cm
Perennial Forb Height (mean)	≥18 cm	10 to <18 cm	<10 cm
Perennial Grass Cover			
Mesic Site	≥15%	5 to <15%	<5%
Arid Site	≥10%	5 to <10%	<5%
Perennial Forb Cover			
Mesic Site	≥10%	5 to <10%	<5%
Arid Site	≥5%	3 to <5%	<3%
Preferred Forb Availability (relative to site potential)	Preferred forbs are common with several species present	Preferred forbs are common but only a few species are present	Preferred forbs are rare
Number of Preferred Forb Species (<i>n</i>)			

*Mesic – Generally >12” precipitation zone. Generally, mountain big sagebrush is the common big sagebrush species.

**Arid – Generally 10-12” precipitation zone. Generally, the common big sagebrush is Wyoming.

Jim Sage Nesting/Early Brood-Rearing



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FIGURE 6: JIM SAGE ALLOTMENT NESTING/ EARLY BROOD-REARING SUITABILITY

CHART 3: NESTING/EARLY BROOD REARING SUITABILITY WITHIN THE JIM SAGE ALLOTMENT

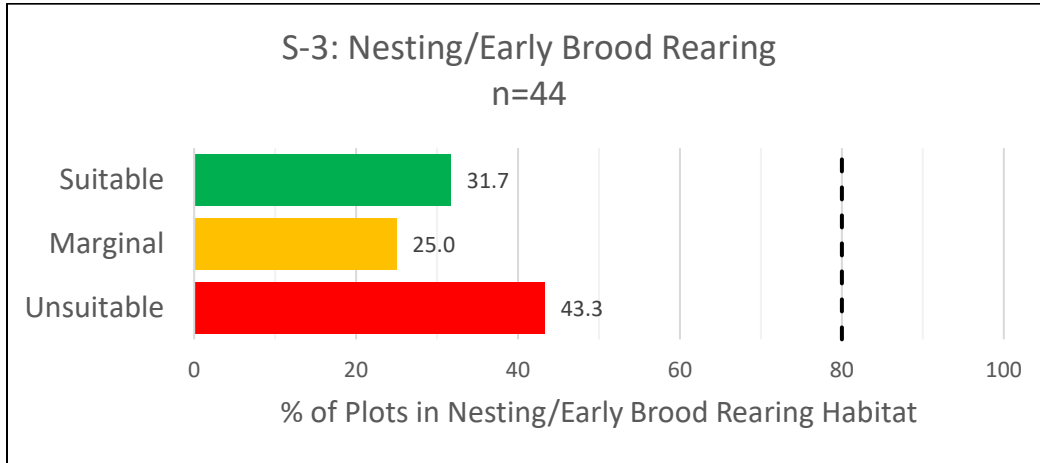


CHART 4: PROPORTIONAL ANALYSIS COMPARISON OF SPRING HABITAT BETWEEN THE UPPER RAFT RIVER FINE SCALE AND THE JIM SAGE ALLOTMENT

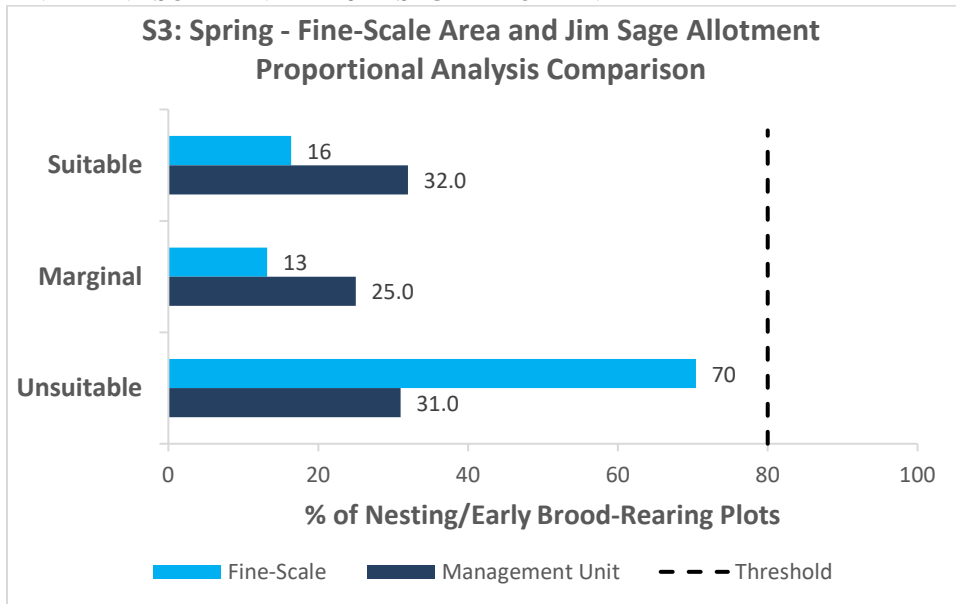
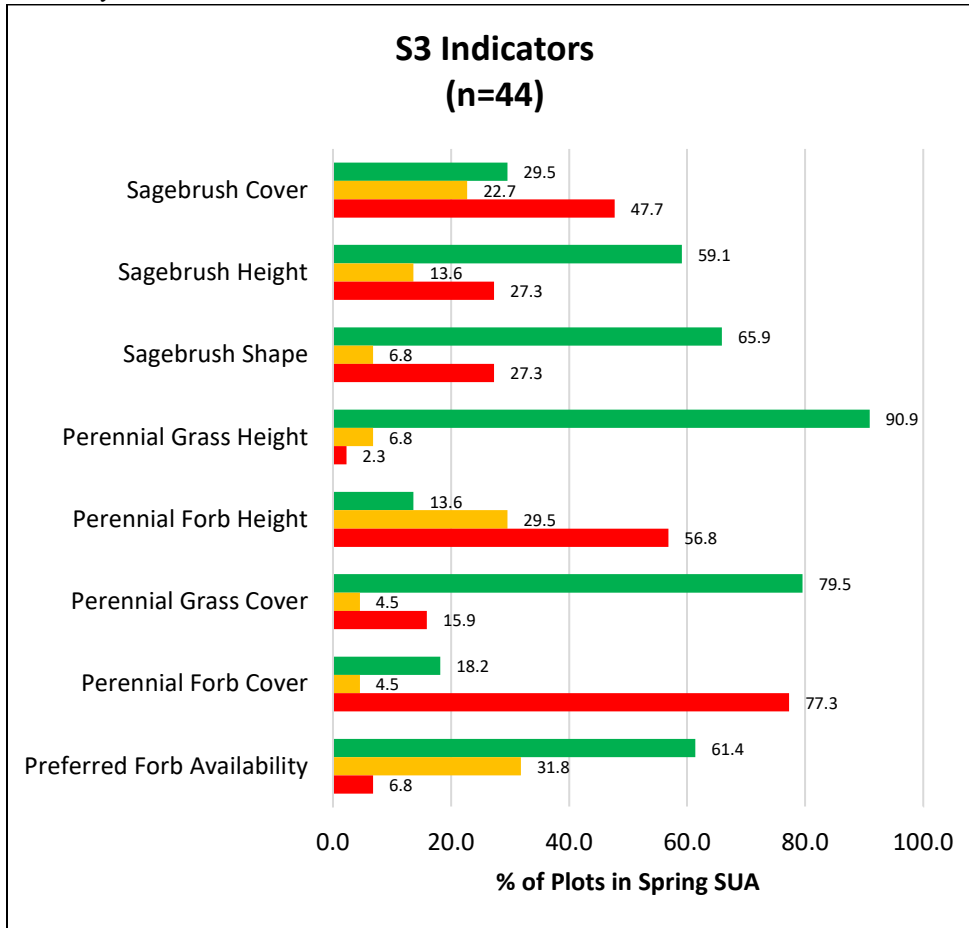


Table 7: Plot Suitability by indicator for Nesting/Early Brood-Rearing.

S-3 Indicators (n=44)	# of Plots							
	Sagebrush Cover	Sagebrush Height	Sagebrush Shape	Perennial Grass Height	Perennial Forb Height	Perennial Grass Cover	Perennial Forb Cover	Preferred Forb Availability
Suitable	13	26	29	40	6	35	8	27
Marginal	10	6	3	3	13	2	2	14
Unsuitable	21	12	12	1	25	7	34	3

Chart 2: Indicators for S-3, Nesting/Early Brood Rearing; a representation of the proportion of plots that meet suitability.



Breeding Habitat (Nesting/ Early Brood-Rearing): Summary

Proportional Analysis Data

Forty-four plots were used to measure the proportion of area in the Jim Sage allotment that met suitability benchmarks for the Upper Raft River Fine-Scale area. The above tables and charts include plot data from the Jim Sage allotment proportional analyses. The benchmark for suitability for nesting/early brood-rearing habitat is 80% of the Fine-Scale SUA. Based on the proportional analysis suitability of the SUA within Jim Sage is currently at 31.7% suitable, 25.0% marginal, and 43.3% unsuitable (Chart 3). Within Jim Sage, one of the largest ecological strata categorized was recently burned, which limited the habitat’s potential for meeting habitat suitability for sage-grouse in some areas primarily due to lack of sagebrush.

Five of the eight indicators for the nesting/early brood-rearing plots had higher percentages of suitable thresholds when compared to the marginal or unsuitable thresholds (Chart 5). Sagebrush cover, perennial forb height/cover were the exceptions. The reduced average perennial forb cover and height is attributed to the number of low-growing forbs that are typically expected for these ecological sites. However, low measurements may be partially attributed to natural limitations associated with the low precipitation ecological sites and year-to-year variability within the

allotment. Low forb canopy cover ratings may also be partially attributed to the inefficacy of capturing small-growing forbs, such as those found throughout most of the allotment, through a line-point intercept data-gathering process.

Plot Counting Data

The charts below show the plot counting results for nesting/early brood-rearing season between Jim Sage and Upper Raft River Fine-Scale analysis area. Since the IIRH points are targeted and were not randomly stratified they cannot be included in the proportional analysis discussed above. Chart 6 represents the 44 AIM, LMF, M-AIM points discussed above. Chart 7 includes the additional sixteen IIRH points which were also rated for sage-grouse habitat suitability. With the inclusion of the 16 IIRH points the percentages of suitable plots increases while the marginal and unsuitable plots decrease in both the Jim Sage allotment and the Upper Raft River Fine-Scale analysis area.

Chart 6: Plot Count Comparison for S-3, nesting/early brood-rearing habitat using AIM, LMF, and M-AIM points.

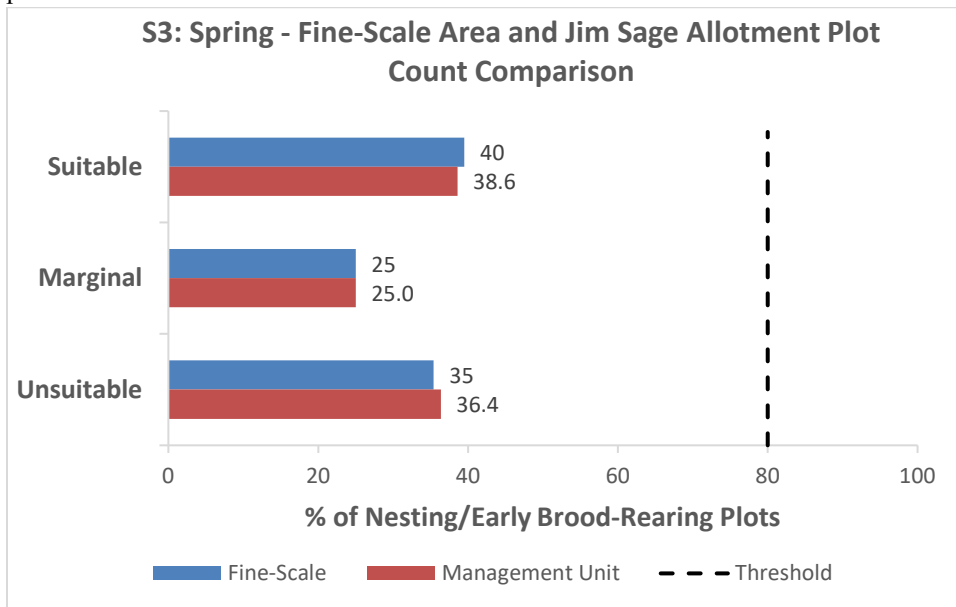
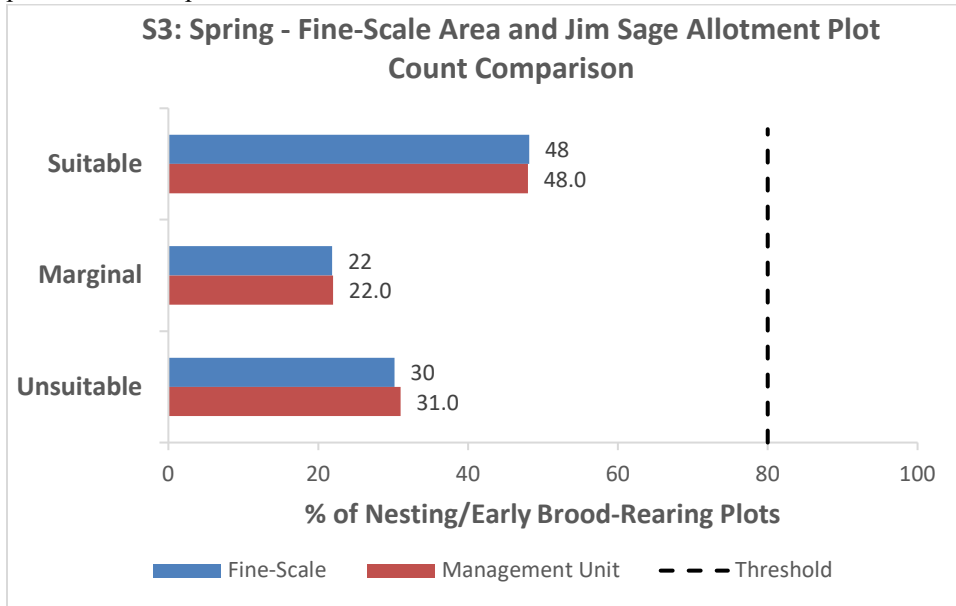


Chart 7: Plot Count Comparison for S-3, nesting/early brood-rearing habitat using AIM, LMF, and M-AIM points and IIRH points.



3.3 Upland Summer/ Late Brood-Rearing Habitat: HAF Form S-4

The delineation for this seasonal use area consisted of the modeled habitat ‘Summer’ layer using the ‘high’, ‘moderate’ and ‘low’ habitat suitability categories (Coates 2014). Monitoring sites that fell within this spatial extent and had data collected between June 15 to September 15 were used to evaluate the suitability of this SUA (Table 8). Indicators assessed for suitability are detailed in the HAF Technical Reference (Stiver et al. 2015, p. 80).

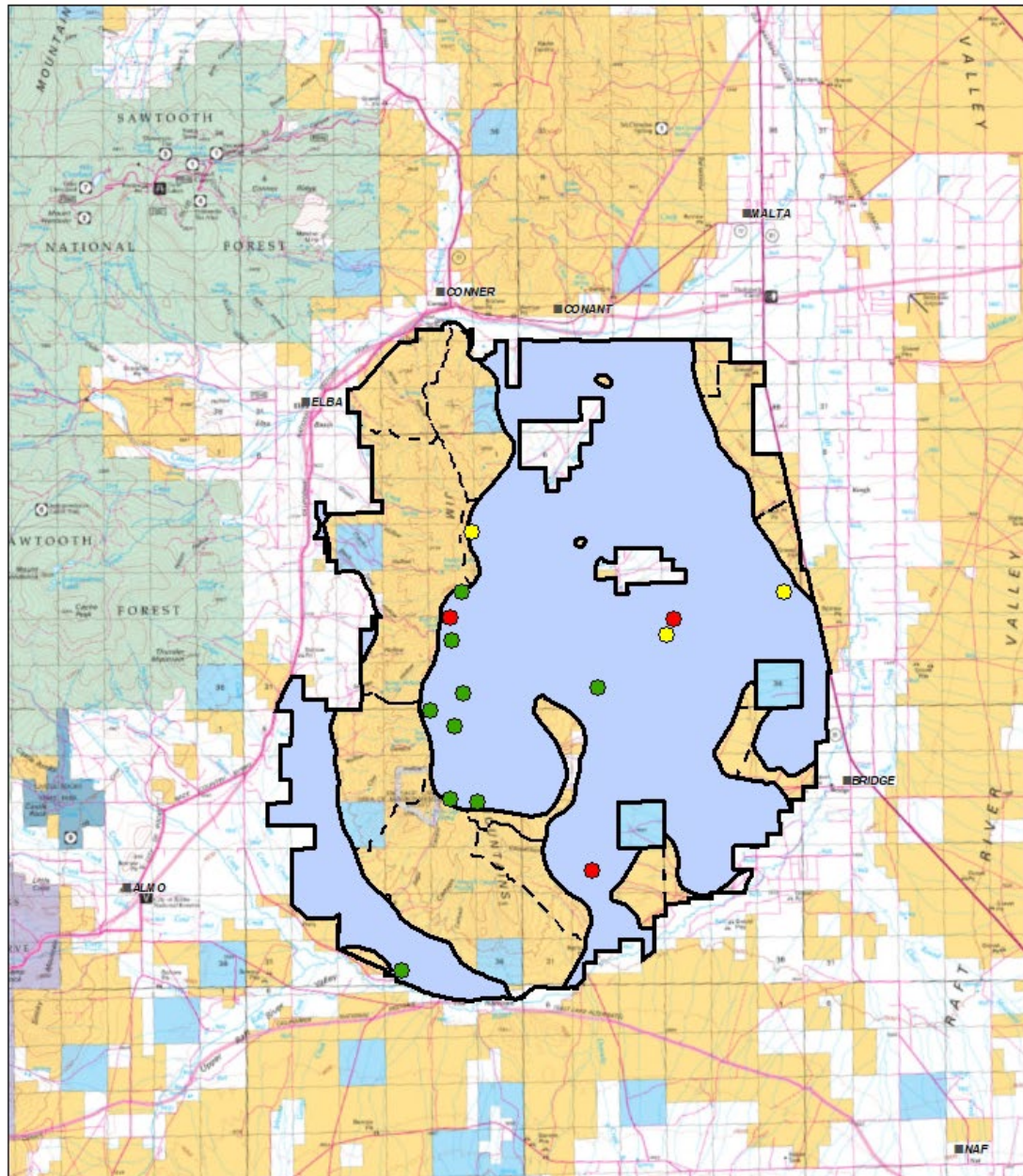
Additionally, two indicators (deep-rooted perennial bunchgrass height and perennial forb cover) from the 2015 ARMPA were considered but not explicitly used to rate the suitability of monitoring sites.

Table 8: Parameters for upland/late brood rearing habitat suitability

Habitat Indicator	Suitable	Marginal	Unsuitable
Sagebrush Cover (mean)	10 to 25%	5 to <10% or >25%	<5%
Sagebrush Height (mean)	40 to 80 cm	20 to <40 or >80 cm	<20 cm
Perennial Grass and Forb Cover (mean)	≥15%	5 to <15%	<5%
Preferred Forb Availability (relative to site potential)	Preferred forbs are common with	Forbs are common but only a few	Preferred forbs are rare

Habitat Indicator	Suitable	Marginal	Unsuitable
Number of Preferred Forb Species (n)	appropriate numbers of species present	preferred species are present	

Jim Sage Summer/Late Brood-Rearing



Jim Sage_S4

S4_Rating

● Marginal

● Suitable

● Unsuitable

■ Jim_Sage_Summer_SUA

U.S. Department of the Interior
Bureau of Land Management
Tampa Field Office, Idaho

Date: 3/23/2021

1:188,452

0 1 2 4 Miles



These data are provided by Bureau of Land Management (BLM) and might contain errors or omissions. The user assumes the user's responsibility for determining whether these data meet the user's intended use.



Service Layer Credits: Bureau of Land Management, National Operations Center,

Document Path: R:\tech\id\id\EXLLOYFY 2021\Jim Sage_RHA\JimSage_S4_11_Mapping.mxd

FIGURE 7: JIM SAGE ALLOTMENT UPLAND SUMMER/ LATE BROOD-REARING SUITABILITY

CHART 8: UPLAND SUMMER SUITABILITY WITHIN JIM SAGE ALLOTMENT

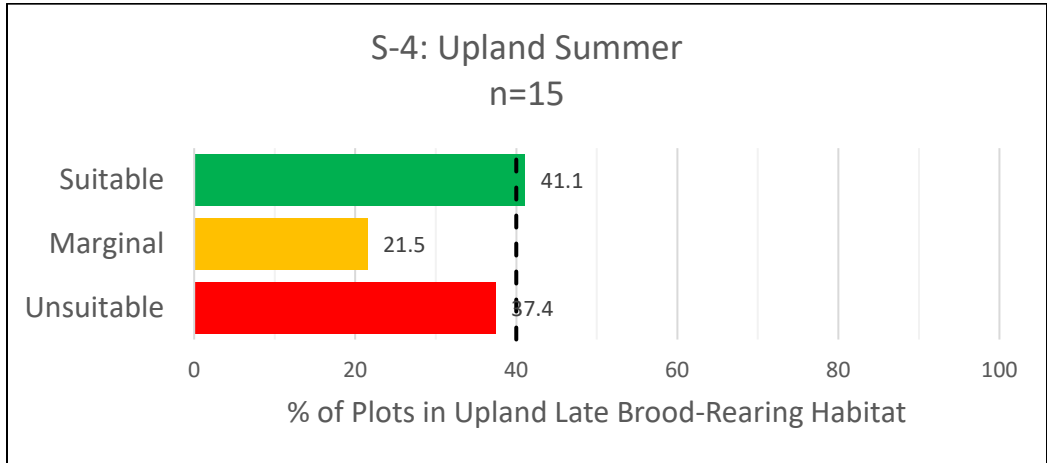


CHART 9: COMPARISON OF SUMMER UPLAND HABITAT BETWEEN THE UPPER RAFT RIVER FINE SCALE AND THE JIM SAGE ALLOTMENT

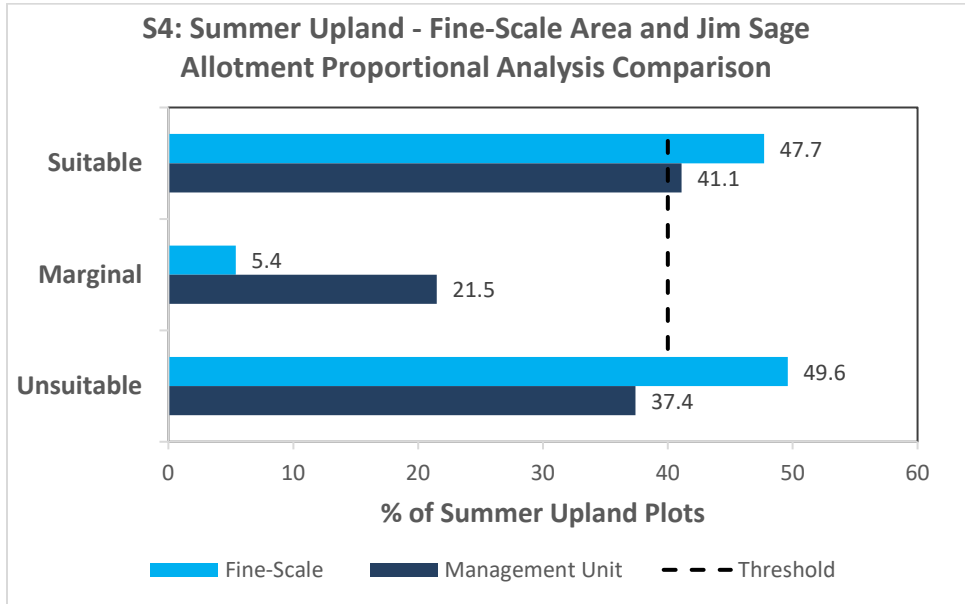
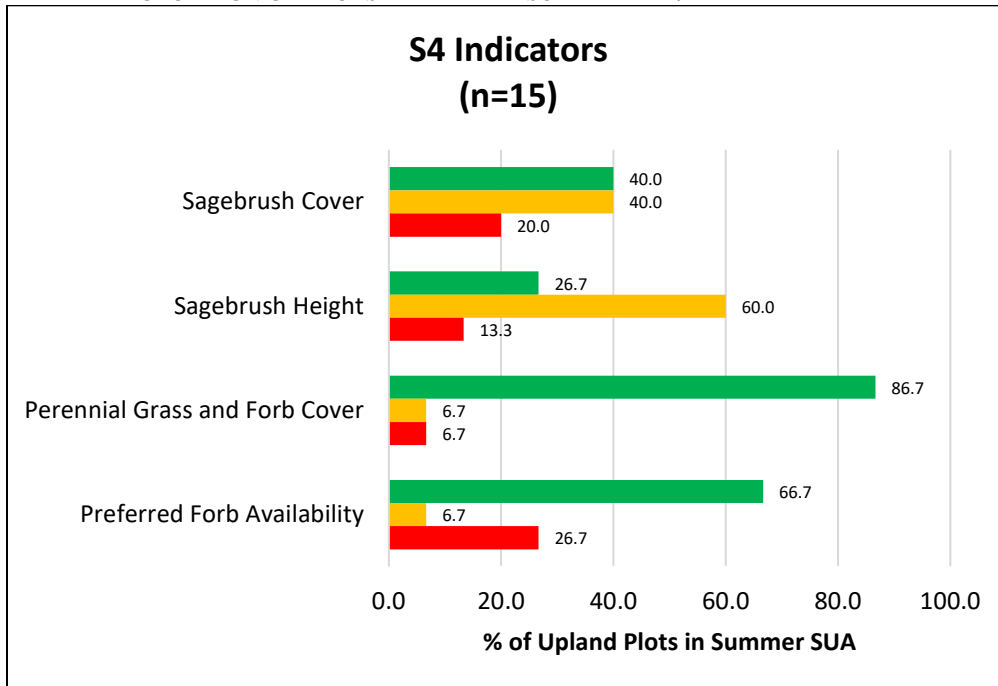


Table 9: Plot Suitability by indicator for Upland Summer/Late Brood-Rearing

S4 Indicators (n=15)	# of Plots			
	Sagebrush Cover	Sagebrush Height	Perennial Grass and Forb Cover	Preferred Forb Availability
Suitable	6	4	13	10
Marginal	6	9	1	1
Unsuitable	3	0	1	4

CHART 3: INDICATORS FOR S-4, UPLAND SUMMER/LATE BROOD REARING; A REPRESENTATION OF THE PROPORTION OF PLOTS THAT MEET SUITABILITY.



Upland Summer/ Late Brood-Rearing Habitat: Summary

Two types of habitat are considered when assessing late-brood rearing habitat for sage-grouse. As reference, upland summer/late brood-rearing habitat areas are used by hens raising broods after they have hatched. Upland summer/late brood-rearing habitat makes up the majority proportion of summer habitat, but it is observed that hens and their broods also tend to inhabit riparian/wetland areas during the summer season as upland vegetation dries up (Connelly et al. 2011). Because of this, targeted riparian area surveys were completed in 2019 to assess riparian systems within the summer SUA boundary on Jim Sage (discussed in section 3.4 below).

Chart 8 depicts suitability indicator values for upland summer/late brood-rearing habitat. Sagebrush cover, sagebrush height, and forb availability were significant influences on the rating. Upland summer/late brood-rearing habitat proportional suitability is higher than the 40% need to reach the suitable benchmark; the upland summer SUA is at 41.1% suitable (see Chart 8). The amount of unsuitable summer/late brood-rearing habitat currently at 37.4% due to a combination of sites lacking suitable sagebrush cover or preferred forb availability (Chart 9). Given that the majority proportion of summer habitat is rated either suitable or marginal (~63%), there is evidence that healthy upland summer habitat is found in mid-to higher elevations. Sites in these areas may provide suitable cover and preferred forb available hens and broods need during the summer months. Upland summer sites in the lower elevations tend to receive less precipitation and the forbs at these sites may not be available late into the season, affecting the overall suitability.

Additionally, 2 IIRH points were assessed for upland summer/late brood rearing habitat. One site was burned in the 2018 Connor fire and was rated as unsuitable, the other was in the higher elevations and was rated as suitable.

3.4 Riparian Summer/ Late Brood-Rearing Habitat: HAF Form S-5

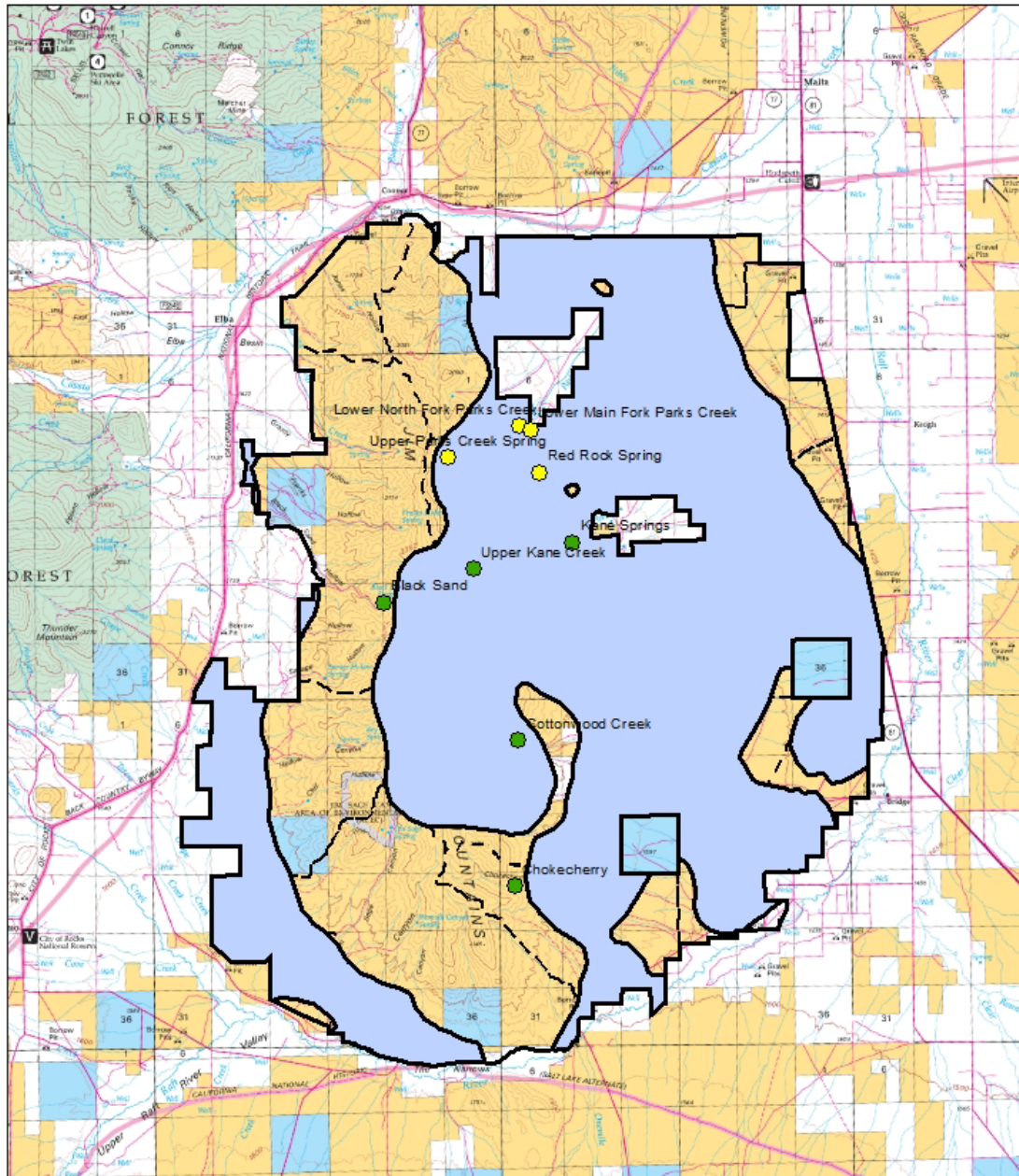
There is no existing spatial information depicting known or designated late brood-rearing areas within Idaho; research suggests that hens generally move their broods to more mesic conditions, such as higher elevation sagebrush communities, mountain shrub communities or wet meadow complexes, among others (Stiver et al. 2015).

Existing Proper Functioning Condition (PFC) Assessments for Lotic and Lentic Areas (TR 1737-15 and 1737-16) were also used to provide insight into riparian summer/late brood-rearing habitat suitability within riparian areas. Proper Functioning Condition assessments are qualitative and not necessarily dependent upon seasonal factors such as plant phenology or breeding season chronology, which are important factors in evaluating suitability for other SUAs.

Table 10: Parameters for riparian/late brood rearing habitat suitability

Habitat Indicator	Suitable	Marginal	Unsuitable
Riparian Stability	Majority of areas are in PFC.	Majority of areas are FAR.	Majority of areas are NF.
Preferred Forb Availability (relative to site potential)	Preferred forbs are common with appropriate numbers of species present.	Preferred forbs are common but only a few species are present.	Preferred forbs are rare.
Availability of Sagebrush Cover (mean)	Sagebrush cover is adjacent to brood rearing areas (less than 100m).	Sagebrush cover is in close proximity to brood rearing areas (100 to 275m).	Sagebrush cover is unsuitable (more than 275m)

Riparian Summer/Late Brood-Rearing Suitability



Legend

- Marginal
- Suitable
- Range Allotment
- Jim_Sage_Summer_SUA

US Department of the Interior
 Bureau of Land Management
 Boise, Idaho, USA
 Date: 2/25/2021

0 0.75 1.5 3 Miles

N
 1:150,000

Service Layer Credits: Bureau of Land Management, National Operations Center,

These data are provided by Bureau of Land Management (BLM) and are not intended to be used for any purpose other than the one for which they were collected.

The data shown here were collected with the use of remote sensing data and are not intended to be used for any purpose other than the one for which they were collected.

FIGURE 8: JIM SAGE ALLOTMENT RIPARIAN SUMMER/LATE BROOD-REARING

CHART 10: SUMMER RIPARIAN SUITABILITY WITHIN JIM SAGE ALLOTMENT

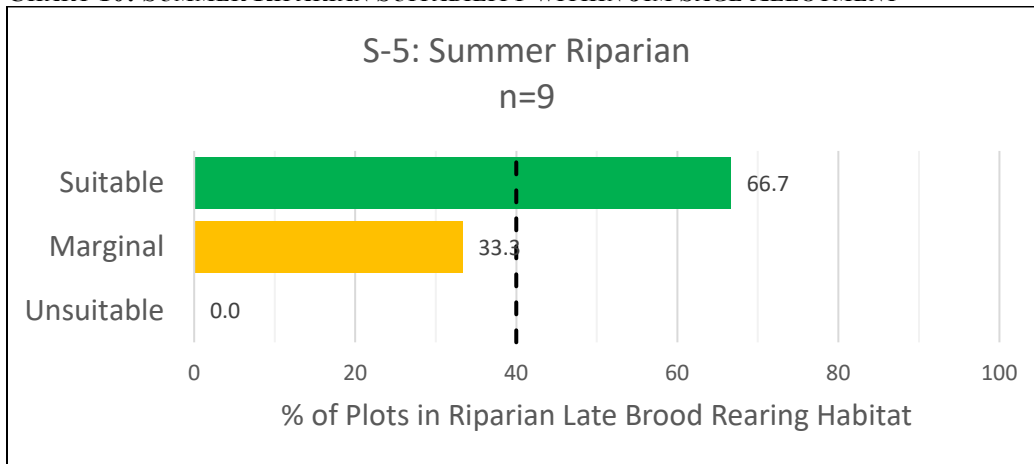


CHART 41: PLOT COUNT COMPARISON OF SUMMER RIPARIAN HABITAT BETWEEN THE UPPER RAFT RIVER FINE SCALE AND THE JIM SAGE ALLOTMENT.

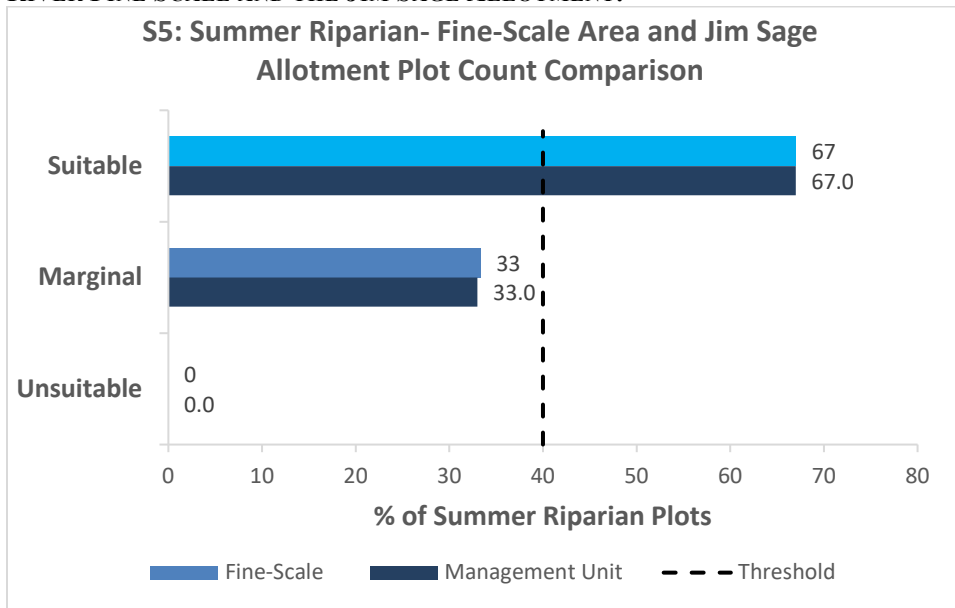
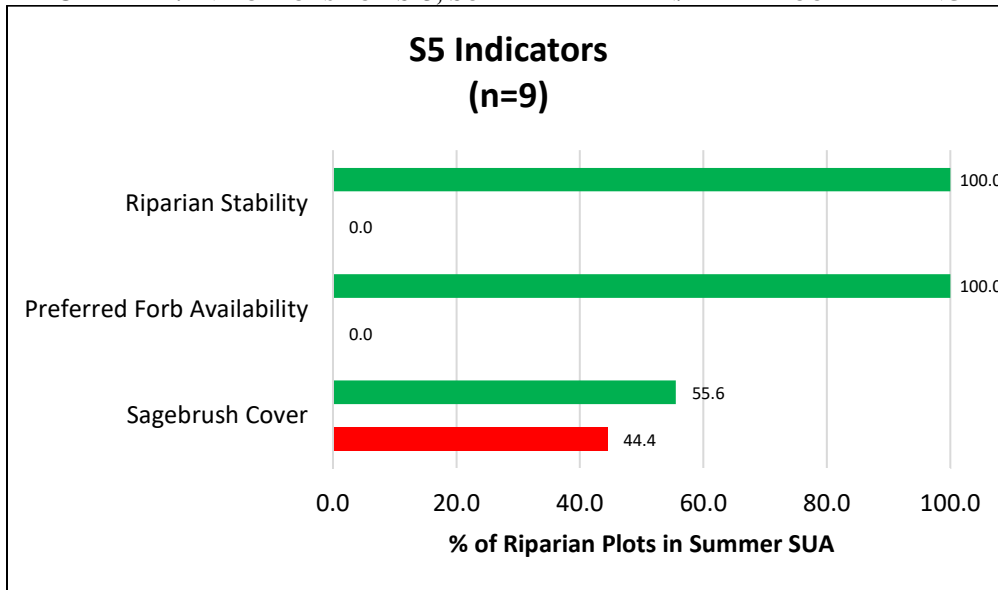


Table 11: Plot Suitability by indicator for Summer Riparian/Late Brood-Rearing

S5 Indicators (n=0)	# of Plots		
	Riparian Stability	Preferred Forb Availability	Sagebrush Cover
Suitable	9	9	5
Marginal	0	0	0
Unsuitable	0	0	4

CHART 12: INDICATORS FOR S-5, SUMMER RIPARIAN/LATE BROOD-REARING



3.5 Riparian Summer/ Late Brood-Rearing Habitat: Summary

Plot Counting Data

Nine riparian area plots were assessed for suitability with 3 indicators: proximity to sagebrush cover, PFC (Proper Functioning Condition), and preferred forb diversity (see Table 10 above). Of the plots, 67% were considered suitable, and 33% were considered marginal (Chart 10 above), which is well above the 40% Suitable benchmark. None of the plots were considered unsuitable within the Jim Sage allotment. PFC indicators were rated and 100% of the plots met the riparian stability threshold (Chart 12). Due to the 2018 Connor Fire four sites (44.4%) were rated as unsuitable for proximity to sagebrush cover. Although these sites lacked suitable sagebrush cover, marginal ratings were given at 3 of these sites due to the PFC and preferred forb availability rated as suitable. These sites continue to provide sage-grouse hens and broods with forbs late into the summer season post fire.

Since sites used in the analysis of summer riparian/late-brood sites were targeted (i.e. not randomly stratified throughout the allotment) the proportional analysis of the suitable sites across the Jim Sage allotment could not be conducted. At this time, PFC ratings on other reaches within the Upper Raft River Fine-Scale boundary have been conducted, but the plot comparison of this data was not used for this analysis. Legacy data for these locations is currently being compiled to inform the Site-Scale summer riparian/late-brood suitability.

3.6 Winter Habitat: HAF Form S-6

Winter suitability is based on sagebrush cover and height (Table 12). Height of sagebrush above snow is estimated using the Snow Data Assimilation System (SNODAS) data product from the National Snow and Ice Data Center (<https://nsidc.org/data/g02158>). SNODAS provides daily snow depth profiles at 1 km² resolution from 2004 – 2018. BLM uses this data to calculate the

median snowpack December 1 to February 28 for each water year (i.e., the maximum snow depth for 50 percent of the winter season, or approximately 6.5 weeks). In order to account for inter-annual variability in snowpack, BLM aggregates years to calculate the 10th, 50th and 90th percentiles of the seasonal snowpack for each pixel across water years. These are used to represent the 15-year low, normal, and high snow depth. Average sagebrush height above snow is obtained by comparing sagebrush height as measured in the field at AIM, LMF, M-AIM and IIRH plots to the snow depth in the relevant pixel for either a low, average, or high snow year depending on the conditions during the winter prior to the sample date (i.e., if the 2017-2018 winter had low snowpack, a plot sampled in 2018 would be compared to the median snow depth in the “low snow year” raster)

Table 12: Parameters for winter habitat site suitability.

Habitat Indicator	Suitable	Marginal	Unsuitable
Sagebrush Cover (mean)	≥10%	5 to <10%	<5%
Sagebrush Height (above snow) (mean)	≥25 cm	>10 to <25 cm	≤10 cm

Winter Suitability

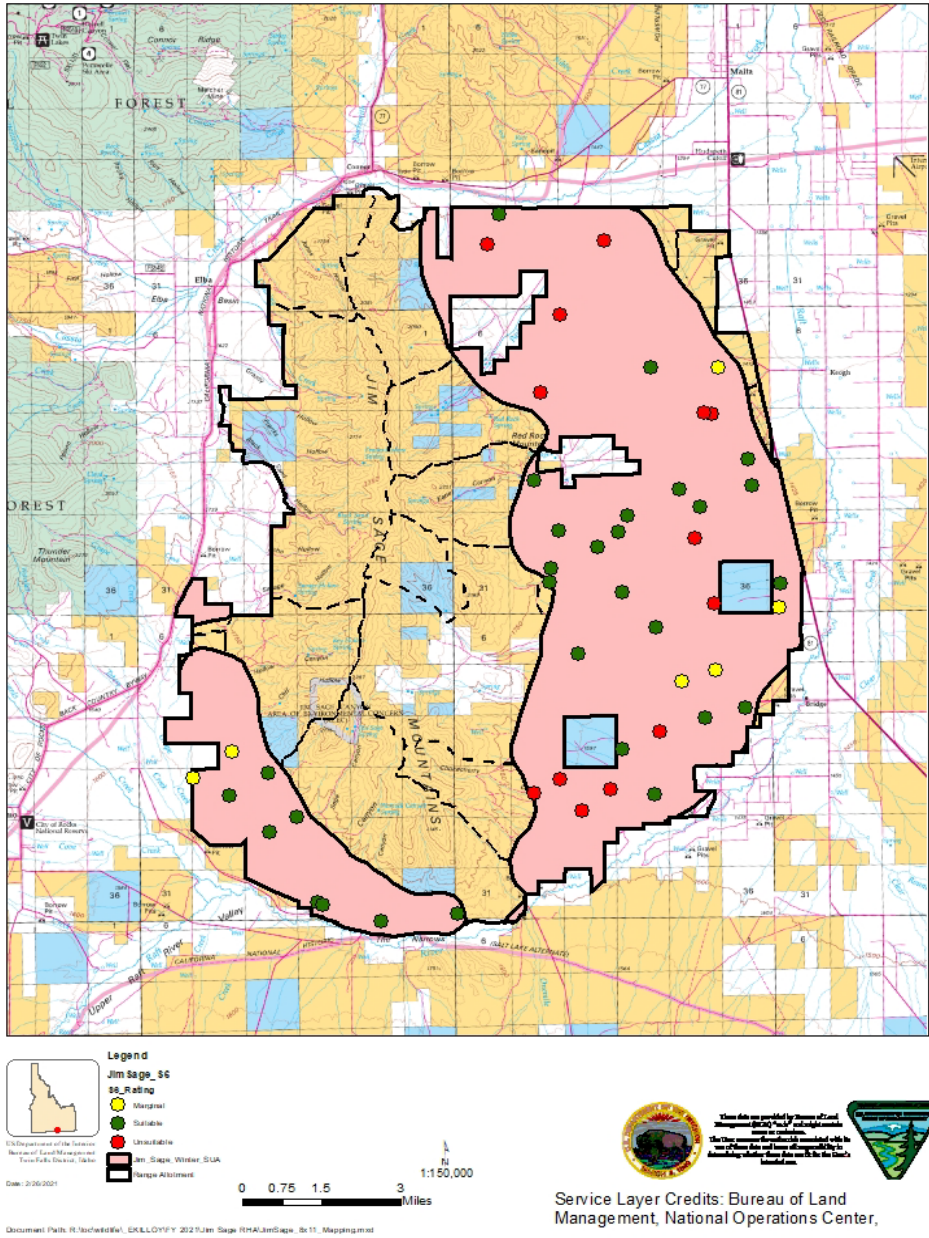


Figure 9: Jim Sage Allotment Winter Suitability

CHART 13: WINTER SUITABILITY WITHIN JIM SAGE ALLOTMENT

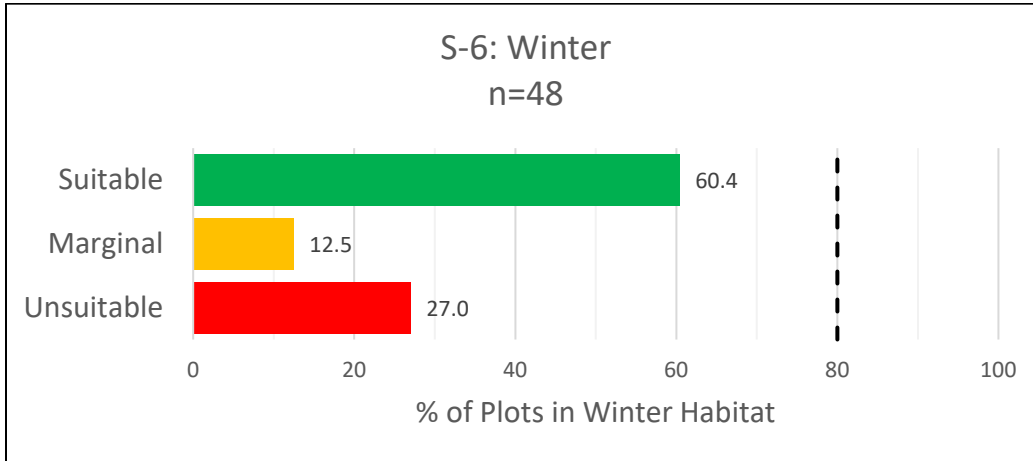


CHART 14: PROPORTIONAL ANALYSIS COMPARISON OF WINTER HABITAT BETWEEN THE UPPER RAFT RIVER FINE SCALE AND THE JIM SAGE ALLOTMENT.

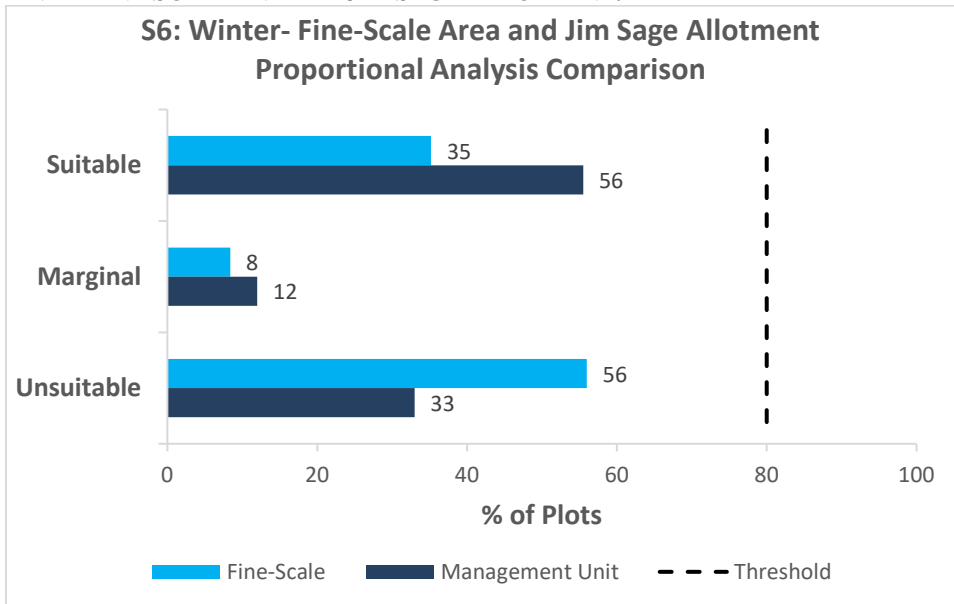
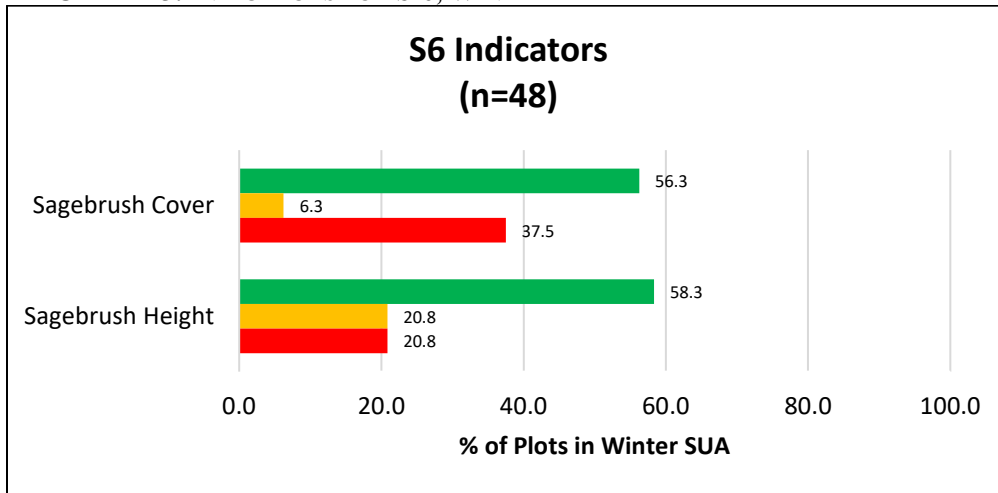


Table 13: S-6 Winter Plot

S6 Indicators (n=48)	# of Plots	
	Sagebrush Cover	Sagebrush Height
Suitable	27	28
Marginal	3	10
Unsuitable	18	10

CHART 15: INDICATORS FOR S-6, WINTER



Winter Habitat (S-6): Summary

Proportional Analysis Data

Forty-eight winter plots were selected from the existing spring and summer plots that fell within the winter SUA on Jim Sage. These sites were assessed for site suitability utilizing indicators for suitability including percent sagebrush cover, depth of sagebrush height above snow (mean values, using SNOWTEL modelled data). Within the Jim Sage winter SUA proportional analysis area, 56% were rated as suitable, 12% were marginal, and 33% were unsuitable (Chart 14). Greater than half of the assessed sites had suitable sagebrush cover and heights. The limiting factor for winter suitability is the presence of sagebrush and sites within the recently burned areas and some of the historic crested wheatgrass and Russian wildrye seedings sagebrush was absent or below the 10% threshold to meet suitability.

Plot Counting Data

The charts below show the plot counting results for winter season between Jim Sage and Upper Raft River Fine-Scale analysis area. Since the IIRH points were targeted and not randomly stratified they cannot be included in the proportional analysis discussed above. Chart 16 represents the 48 AIM, LMF, M-AIM points discussed above. Chart 17 includes the additional 14 IIRH points which were also rated for sage-grouse habitat suitability. With the inclusion of the 14 IIRH points the percentages of suitable plots increases while the marginal and unsuitable plots decrease in both the Jim Sage allotment and the Upper Raft River Fine-Scale analysis area.

Chart 16: Plot Count Comparison for S-6, winter habitat using AIM, LMF, and M-AIM points.

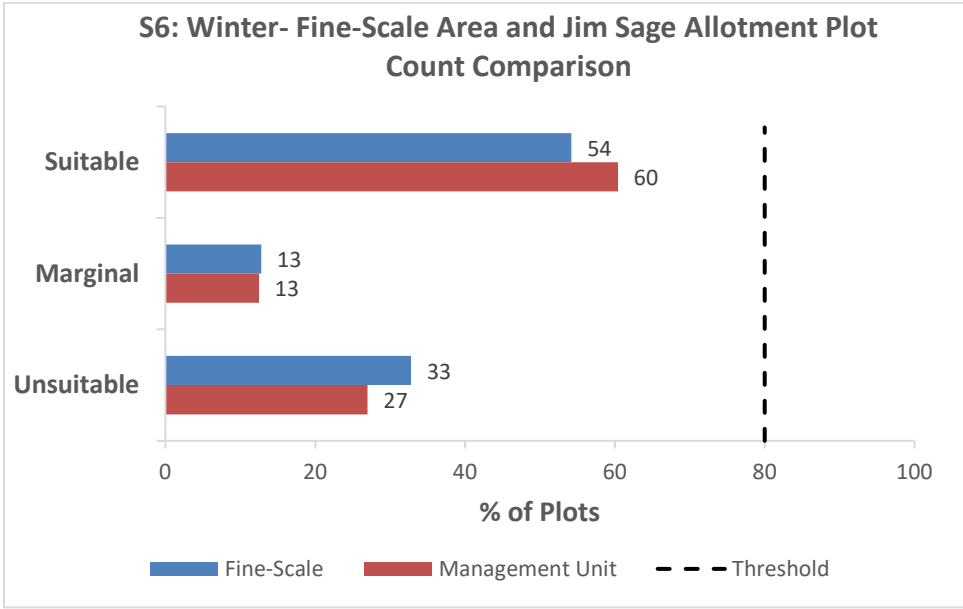
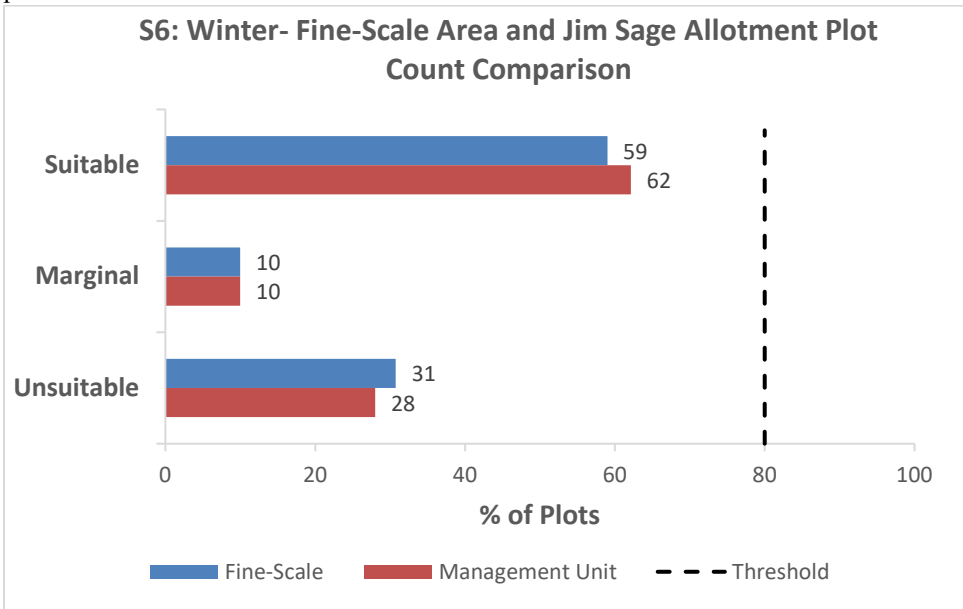


Chart 17: Plot Count Comparison for S-6, winter habitat using AIM, LMF, and M-AIM points and IIRH points.



3.7 Management Unit and Fine-Scale Comparison

Table 21. Overall ranking for the Jim Sage allotment sage-grouse habitat assessment.

Lekking: <i>Plot Counting</i>	Nesting/Early Brood-Rearing: <i>Proportional Analysis</i>	Upland Summer/Late- Brood Rearing: <i>Proportional Analysis</i>	Riparian Summer/Late-Brood Rearing: <i>Plot Counting</i>	Winter: <i>Proportional Analysis</i>
Suitable	Marginal	Suitable	Suitable	Marginal

Table 22. Overall rankings for the Upper Raft River Fine Scale sage-grouse habitat assessment.

Lekking: <i>Plot Counting</i>	Nesting/Early Brood-Rearing: <i>Proportional Analysis</i>	Upland Summer/Late- Brood Rearing: <i>Proportional Analysis</i>	Riparian Summer/Late-Brood Rearing: <i>Plot Counting</i>	Winter: <i>Proportional Analysis</i>
Suitable	Unsuitable	Suitable	NULL	Marginal

Overall ratings for sage-grouse seasonal habitat use the for Jim Sage Allotment and Upper Raft River Fine-Scale area are listed Table 21 and Table 22 above. Sites were compared based on the type of assessment conducted for each specific habitat use (*plot counting vs. proportional analysis*).

Lekking

Through the plot counting analysis overall lek site suitability within Jim Sage is consistent with lek site suitability throughout the Upper Raft River Fine-Scale area with both scales at just over 80% suitable (Chart 2).

Nesting/Early Brood-Rearing

For the Jim Sage allotment the common influences negatively effecting suitability in nesting/early brood-rearing and winter habitat is the absence of sagebrush in some of the historical crested seeding, recently burned areas, and the Wyoming/greasewood ecological sites.

Suitable habitat within the proportional analysis area for nesting/early brood-rearing habitat on Jim Sage is greater than Upper Raft River Fine-Scale overall suitability. Jim Sage also has less unsuitable habitat when compared to the Upper Raft River Fine Scale area. Although both scales are not meeting the 80% threshold required to meet suitability the 70% unsuitable habitat within the Upper Raft River Fine-Scale area changes the overall rating for this scale. Although the

nesting/early brood-rearing habitat on Jim Sage is rated as marginal; Jim Sage is positively contributing to the upland summer/late-brood rearing habitat due lower percentages of unsuitable habitat (Chart 4).

Upland Summer/Late-Brood Rearing

Within the higher elevations of the upland summer/late brood-rearing habitat on Jim Sage sagebrush cover, perennial grass and forb cover, and preferred forb availability mostly rated as suitable. The lower elevation upland summer/late brood-rearing habitat dries faster than the higher elevations and therefore perennial forbs may not be available to sage-grouse later into the season.

Suitability within the proportional analysis area for upland summer/late brood-rearing habitat on Jim Sage is lower than Upper Raft River Fine-Scale overall suitability. However, Jim Sage is positively contributing to the upland summer/late-brood rearing habitat due lower percentages of unsuitable habitat.

Riparian Summer/Late-Brood Rearing

Riparian summer/late-brood rearing sites with Jim Sage are all meeting PFC and have suitable perennial forb availability at each site. In the absence of fire, sites within the spring and winter SUAs that do not meet suitability for sagebrush cover should recover and have the potential to be suitable in the future.

PFC data, outside of Jim Sage, but within the Upper Raft River Fine-Scale boundary has previously been conducted on other streams. However, comparisons between Jim Sage and the Upper Raft River Fine-Scale area cannot be conducted because the analysis for riparian summer/late brood-rearing habitat within the fine-scale area has yet to be completed.

Winter

Overall suitability within the winter habitat on Jim Sage is greater than the overall suitability found within Upper Raft River Fine-Scale area. In addition, unsuitable winter habitat on Jim Sage less than the unsuitable habitat found within Upper Raft River Fine-Scale area. Therefore, Jim Sage is positively contributing to winter habitat found within the Upper Raft River Fine-Scale Area.

4.0 References

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Prichard, D., F. Berg, W. Hagenbuck, R. Krapf, R. Leinard, S. Leonard, M. Manning, C. Noble, and J. Staats. 2003. Riparian area management: A user guide to assessing proper functioning condition and the supporting science for lentic areas. Technical Reference 1737-16. U.S. Department of the Interior, Bureau of Land Management, National Applied Research Science Center, Denver, CO.

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