# Candidate Conservation Agreement with Assurances for the Greater Sage-Grouse

between

**Mr. and Mrs. William Moore**

and the

**U.S. Fish and Wildlife Service**

for

**Private Rangelands owned and leased by Mr. and Mrs. William Moore Baker and Malheur Counties, Oregon**

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**CCAA Tracking Number: _____**

**CCAA Duration: 30 years (_____ , 2014 – _____ , 2044)**

**July 30, 2014**

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# 1. INTRODUCTION

The greater sage-grouse (sage-grouse) (*Centrocercus urophasianus*) has declined across their range for a variety of causes and now occur in 11 States and two Canadian provinces. Between 1999 and 2003, the Service received eight petitions to list various populations of sage-grouse under the ESA. On January 12, 2005, the U.S. Fish and Wildlife Service (the Service) published a finding that the sage-grouse did not warrant range wide listing under the ESA (USFWS 2005). This "not warranted" finding was challenged in court, and in December 2007, a federal judge ordered the Service to reconsider its decision. On March 23, 2010, the Service released its finding that the sage-grouse warranted listing under the Endangered Species Act (ESA), but the listing was precluded by other, higher priority actions thereby conferring candidate status on the sage-grouse (USFWS 2010). The primary threats to the sage-grouse, as defined in the 2010 finding, are habitat loss, fragmentation, and degradation. In the Service's 2010 finding, additional concerns were identified as threats, including an increase in the use of sagebrush habitat for renewable energy such as wind power, and the spread of West Nile Virus (WNv). The Service is scheduled to make a new listing decision as to whether or not to list the sage-grouse under the ESA in 2015.

In anticipation of a final listing decision by the Service, William (Bill) and Nancy Moore (the Landowners) requested assistance from the Service in developing a sage-grouse Candidate Conservation Agreement with Assurances (CCAA) for ranch management activities on lands they own in Malheur County and lands they lease through a long-term lease in Baker County, Oregon. A CCAA is a voluntary agreement whereby a landowner agrees to manage their lands to remove or reduce threats to a species at risk of being listed under the ESA. In return for managing their lands to the benefit of a species at risk, the landowner receives assurances against additional regulatory requirements should that species ever be listed under the ESA.

The purpose of this CCAA is to maintain and/or improve sage-grouse habitat and reduce or eliminate negative impacts of rangeland management practices to sage-grouse on the enrolled lands. This agreement recognizes that ranching operations implemented by the Landowners will contribute to the conservation of sage-grouse by providing areas of continuous, quality habitat on private lands in Baker and Malheur Counties. In addition, the Service, through this agreement, recognizes the continued sustainability of these operations is a primary means of preventing further habitat fragmentation and loss. Under this CCAA, the Service will issue the Landowners an Enhancement of Survival (EOS) permit pursuant to section 10(a)(1)(A) of the ESA for the enrolled lands for a period of 30 years. During the 30 years, this CCAA can be updated and revised, upon mutual agreement, so that it will continue to provide the added conservation benefits for sage-grouse.

Since the agreement is voluntary, the Landowners can end it at any point, although in doing so they would give up any assurances (i.e. coverage for the enrolled Landowners under the EOS permit would terminate).

This CCAA includes:

- Description of the responsibilities of Parties
- Area to be covered under the CCAA
- Habitat requirements, status, and general threats to sage-grouse

- Conservation measures (CMs) designed to remove or reduce identified threats on the enrolled lands
- Expected benefits of the CMs
- Monitoring requirements and forms

# 2. AUTHORITY AND PURPOSE

Sections 2, 7 and 10 of the ESA of 1973, as amended (ESA, 16 U.S.C. 1531 *et seq*.), allow the Service to enter into this CCAA. Section 2 of the ESA states that encouraging interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs is a key to safeguarding the Nation's heritage in fish, wildlife, and plants. Section 7 of the ESA requires the Service to review programs that it administers and to utilize such programs in furtherance of the purposes of the ESA. Section 10 describes permits issued under the ESA, exempting certain prohibitions under Section 9.

By entering into a CCAA, the Service is utilizing its Candidate Conservation Programs for further conservation of the Nation's fish and wildlife. Consistent with the Service's "Candidate Conservation Agreement with Assurances Final Policy" (USFWS 1999), the conservation goal of this CCAA is to maintain and enhance sage-grouse on private rangelands owned and leased by the Landowners in Baker and Malheur Counties, Oregon. The Landowners will meet this conservation goal by implementing CMs to address threats to the species, and will receive regulatory certainty from the Service concerning land use restrictions that might otherwise apply, should this species be listed under the ESA.

The primary purpose of this CCAA is to promote grazing practices that reduce or eliminate threats to sage-grouse on the enrolled lands and ensure grazing practices that are neutral or beneficial to sage-grouse can likely continue unaffected if the species is listed in the future. This CCAA provides a framework for the Landowners to voluntarily implement CMs for sage-grouse on his privately-owned and leased rangelands. More specifically, this CCAA will accomplish the following:

- Support implementation of the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (Hagen 2011);
- Serve as an important component of a larger, landscape-level approach to address the conservation needs of sage-grouse in Oregon;
- Identify CMs for the enrolled lands for rangeland management activities that are beneficial for sage-grouse, based on best available science;
- Support the continuation of livestock operations on the enrolled lands while protecting and improving habitat conditions for sage-grouse; and
- Recognize the contribution to sage-grouse conservation made by working ranches.

In addition, there are three goals this CCAA is designed to meet:

- Provide the Landowners assurances that current ranch and land management practices covered by this CCAA will continue in the event sage-grouse is listed under the ESA.
- Promote CMs that reduce or remove threats to sage-grouse through proactive ranch and land management, providing comprehensive conservation to meet the CCAA standard.
- Provide an ecological approach to maintain current sage-grouse habitat and to improve habitat that is not meeting conservation objectives, as identified in this CCAA.

# 3. SPECIES BIOLOGY

Greater sage-grouse in western North America were once abundant and widespread, but have declined throughout their range. Sage-grouse populations are closely associated with sagebrush (*Artemisia* spp.) habitats. Sage-grouse are known for their elaborate mating ritual wherein males congregate and perform a courtship dance on a specific strutting ground called a lek. Lek sites are typically open areas within sagebrush stands that have good visibility for predator detection and acoustical qualities so the sounds of display activity can be heard by other sage-grouse. Male sage-grouse display on leks in early morning and late evening to attract females. The timing of lek attendance varies considerably depending on snow depth, elevation, weather, and geographic region, with first attendance ranging from the end of February to early April and ending in late May or early June (Hagen 2011). Females exhibit strong fidelity to breeding areas (Fischer *et al*. 1993); habitats used by females prior to nesting are also part of the general breeding habitat. Breeding activities occur from March to early June; however, the lek is considered the center of year-round activity for resident grouse populations (Eng and Schladweiler 1972, Wallestad and Pyrah 1974, Wallestad and Schladweiler 1974). Dominant males will breed with more than one female. Females leave the lek and begin their nesting effort after mating; males provide no paternal care or resources.

Optimum sage-grouse nesting habitat consists of a healthy sagebrush ecosystem complete with sagebrush plants (primarily basin big sagebrush *(Artemisia. tridentata* ssp. *tridentata),* mountain big sagebrush *(A. t.* ssp. *vaseyana),* Wyoming big sagebrush *(A. t.* ssp. *wyomingensis),* and low sagebrush *(A. arbuscula)* in Oregon) and a strong native herbaceous understory composed of grasses and forbs (Hagen *et al.* 2007). Nests are typically shallow bowls lined with leaves, feathers, and small twigs placed on the ground at the base of live sagebrush; however, nests have been found under other plant species (Connelly *et al.* 1991, Gregg 1991). Sage-grouse females that nest under sagebrush tend to have higher nest success rates (53 percent) than those females nesting under other species (22 percent; Connelly *et al.* 1991). In addition, female sage-grouse tend to select nest sites under sagebrush plants that have large canopies (Hagen *et al*. 2007). On average, 80 percent of nests are within 6.2 km (4 mi) of the lek, but some females have been shown to nest 20 km (12 mi) from a lek (Hagen 2011). Sagebrush canopies provide overhead cover and are often associated with an herbaceous understory that provides lateral cover for the birds and allows them to hide from predators (Patterson 1952, Klebenow 1969, Wallestad and Pyrah 1974, Gregg 1991, Gregg *et al.* 1994, Holloran *et al*. 2005). Female sage-grouse nesting in cover conditions that provide both overhead and lateral cover have higher nest success rates than those nesting under lesser cover conditions (Wallestad and Pyrah 1974, DeLong *et al*. 1995, Holloran *et al.* 2005).

# 4. THREATS TO SAGE-GROUSE

Detailed descriptions of range-wide and Oregon threats are available in the 12-month warranted but precluded Greater sage-grouse finding (USFWS 2010), as well as the original and updated Oregon Department of Fish and Wildlife Greater Sage-grouse Conservation Assessment and Strategy for Oregon (Hagen 2005, 2011).

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# 5. HISTORIC AND CURRENT CONDITIONS IN OREGON

Sage-grouse were once found in most sagebrush habitats east of the Cascades. The pre-European settlement habitat of sage-grouse encompassed approximately 17.7 million acres of sagebrush habitat throughout eastern Oregon. Sage-grouse habitat has decreased by an estimated 21-percent compared to the amount of habitat available pre-settlement. The conversion of sagebrush steppe to agricultural land in the Columbia Basin alone was responsible for the loss of an estimated 1.5 million acres of sage-grouse habitat.

In addition, Oregon sage-grouse numbers have declined over the long-term (1957-2003; Hagen 2005, 2011). Within the extant range of Oregon, spring population indices have demonstrated an overall decline since the 1940s. However, population indices over the last 30 years suggest a relatively stable statewide population. Habitat loss and fragmentation are the primary cause for long-term changes in population abundance and distribution (USFWS 2010).

# 6. FACTORS AFFECTING THE SPECIES IN OREGON

The long-term persistence of sage-grouse will depend on maintenance of intact landscapes. Sage-grouse are landscape-scale species and the destruction and fragmentation of their habitat has contributed to significant population declines over the past century. If current trends persist, many local populations may disappear in the next several decades, with remaining fragmented populations vulnerable to extinction. Based on a review of the scientific literature related to ranch management, threats to sage-grouse and their habitats in Oregon may include, but are not limited, to the following specific factors (USFWS 2010):

- Habitat fragmentation decreases habitat quantity and quality and threatens the long-term persistence of sage-grouse.
- Infrastructure (e.g., power lines, roads) fragments sage-grouse habitat, decreasing sage-grouse use and habitat quality.
- Establishment of plant communities that do not provide suitable habitat (i.e. monocultures of non-natives) reduces sage-grouse habitat quality and quantity.
- Introduction of non-native invasive plant species can eliminate native plant communities important to sage-grouse, thereby reducing habitat quality and quantity.
- Wildfire removes long-lived species such as sagebrush, thereby reducing sage-grouse habitat quality and quantity.
- Surface water developments (ponds) increase potential mosquito habitat, thereby resulting in increased sage-grouse mortality from disease (i.e. WNv) in some instances.
- Sagebrush management (e.g., prescribed fire, chemical, or mechanical) can result in a reduction of sage-grouse habitat quality and quantity.
- Grazing management practices that alter shrub cover and grass and forb composition can reduce sage-grouse habitat quality and quantity.
- Concentrated livestock use can impact vegetation and soil structure, thereby reducing sage-grouse habitat quality and quantity.
- Encroachment of woodland species into sage-grouse habitat can lead to a reduction in use or abandonment of habitat by sage-grouse.
- Livestock, human, and vehicle activity can physically disturb birds and cause them to leave leks or abandon nests, thereby resulting in decreased reproductive success.

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- Water diversions and spring developments that dry up meadow and riparian areas reduce sage-grouse habitat quality.
- Farm and ranch facilities that provide additional raptor perches or dead piles or garbage dumps attract mammalian and avian predators, thereby increasing opportunities for predation on sage-grouse and sage-grouse nests.
- Application of insecticides removes insects important to sage-grouse, thereby reducing sage-grouse habitat quality.
- Prolonged drought harms plants important to sage-grouse, thereby reducing sage-grouse habitat quality and quantity.
- Livestock watering tanks and troughs without wildlife escape ramps cause sage-grouse mortality by entrapment and drowning.
- Concentrated or overabundant wildlife populations can harm plant communities important to sage-grouse, thereby reducing habitat quality and quantity.
- Poorly designed or located fences (e.g., fences in saddles or along ridgelines) provide a collision risk for birds, thereby resulting in serious injury or death to sage-grouse.
- Over-abundant predator numbers may impact local sage-grouse populations.

# 7. RESPONSIBILITIES OF THE PARTIES

## *7.1 Landowner Responsibilities*

The Landowners will:

- Assist in the implementation of the CCAA in cooperation with the Service;
- Implement all agreed upon CMs within this CCAA within the agreed upon timeframe;
- Avoid impacts to populations and individual sage-grouse present on the enrolled lands to the maximum extent practicable via CMs identified in this CCAA;
- Continue those current practices that have been identified as to assist with conserving sage-grouse via this CCAA;
- Record dates, locations, and numbers of sage-grouse found on the enrolled lands to be included in an annual report;
- Report and record new observations of noxious weeds found on the enrolled lands;
- Report observed sage-grouse mortalities on enrolled lands to the Service within two days;
- Seek funding from available sources to implement this CCAA;
- Provide the Service or their agreed upon representatives access to the enrolled lands at mutually agreeable times to identify or monitor sage-grouse and their habitat, implement CMs, and monitor effectiveness and compliance with this CCAA;
- Cooperate and assist with monitoring activities and other reporting requirements identified in this CCAA;
- Compile and submit monitoring information to the Service annually; and
- Allow the Service to share habitat, planning or monitoring information related to the enrolled lands, when requested.

## *7.2 Service Responsibilities*

The Service will:

- Assist in the implementation of the CCAA in cooperation with the Landowners;
- Serve as an advisor, providing expertise on the conservation of sage-grouse;
- Provide technical assistance to Landowners in implementing the CMs in the CCAA;

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- Notify the Landowners at least 48 hours in advance with a specific time, location, and names of all personnel entering the property and the purpose for the visit, for example, baseline inventory, monitoring;
- Provide support and assist in obtaining funds from other available sources for the implementation of this CCAA;
- Review monitoring data for consistency with CCAA objectives to determine if CMs are providing the desired benefit to sage-grouse; and
- Work with Landowners and other agencies (e.g., agriculture extension agents, NRCS) to facilitate appropriate rangeland monitoring and/or training;

Although the Oregon Department of Fish and Wildlife (ODFW) is not a signatory to this CCAA, the Service and the Landowners agree to seek ODFW's technical expertise in the development and implementation of this CCAA, as needed and appropriate.

# 8. PROPERTY OWNER

This CCAA is an agreement with Bill and Nancy Moore for ranch management activities on lands leased in Baker County, Oregon and for ranch management activities on family-owned property in Malheur County, Oregon.

Bill and Nancy Moore lease, through a long-term lease agreement, property owned by FLR Limited Partnership in Baker County, Oregon. Through this lease agreement, Bill and Nancy Moore have control of the management activities that take place on the Baker County property. Additionally, lands covered by this CCAA include family-owned property (owned by Ingle Real Estate, LLC). Nancy Moore has legal authority on the Malheur County property; Bill and Nancy Moore control the management activities that take place on the property.

## *8.1 Baker County Property*

**Land Lessee**:
William Moore
PO Box 132
Unity, Oregon 97884

## *8.2 Malheur County Property*

**Land Owner**:
Ingle Real Estate, LLC
Nancy Moore
PO Box 132
Unity, Oregon 97884

# 9. DESCRIPTION OF ENROLLED LANDS

This CCAA pertains to private livestock-related management activities on lands owned and leased by Bill and Nancy Moore in Baker and Malheur Counties, Oregon. These enrolled lands are within the current distribution of sage-grouse and currently provide occupied habitat for sage-grouse. These enrolled lands encompass approximately 3,662 acres of core sage-grouse habitat and approximately 3,628 acres of low density sage-grouse habitat.

## *9.1 Baker County Property*

### *9.1.1 General Description*

The Baker County property consists of approximately 3,662 acres of land. The Baker County property lies approximately one mile south of Unity, Oregon. The entire property falls within ODFW Low Density (and preliminary general habitat or PGH) sage-grouse habitat although the property contains three active sage-grouse leks. The birds that use the property belong to the Western Great Basin population (Garton *et al.* 2011). The property also falls within the Baker Resource Area population in Oregon (Hagen 2011) and Management Zone V (Stiver *et al*. 2006). Figure 1 shows various views from the Baker County property.

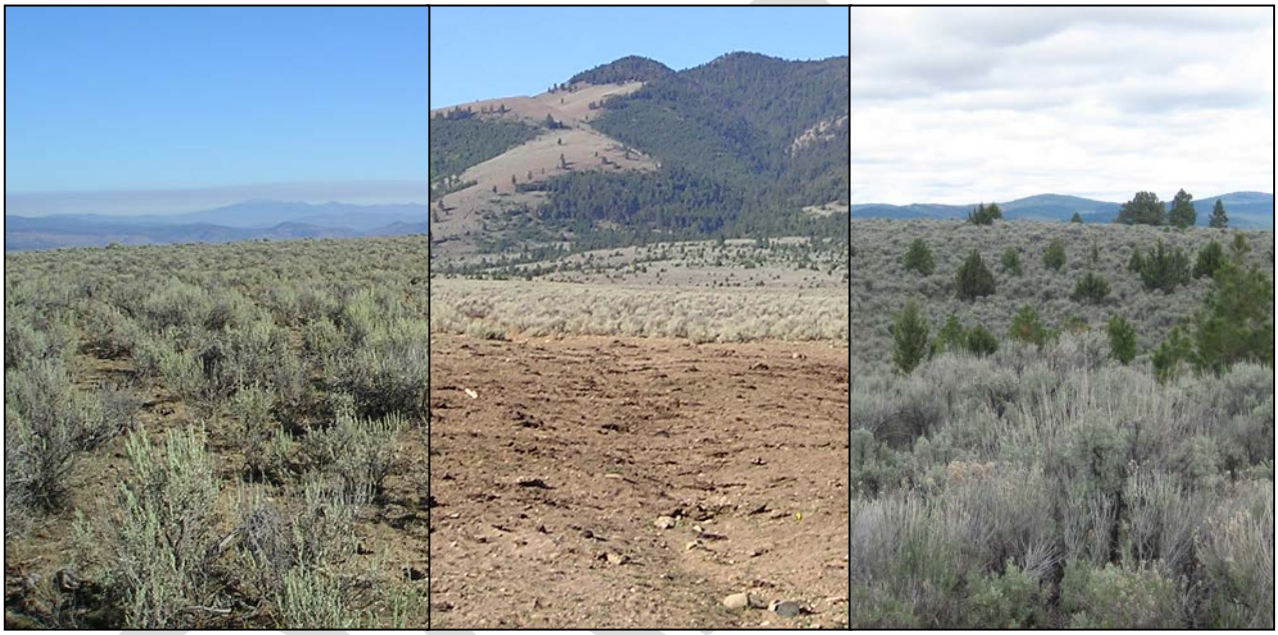

**Figure 1. Photos from left to right: (a) representative property view; (b) lek site; and (c) juniper/conifer treatment area on the Baker County property, Baker County, Oregon.**

The Service estimated the number of sage-grouse that use the Baker County property based on available lek data. In 2011 and 2012, 25 males and 4 males were observed on the leks, respectively (Ratliff *pers. comm.* 2013). In 2013, 14 males were observed on the leks (Meyer 2013). In 2014, there were 6 males on the leks (Moore *pers. comm.* 2014). Using these lek data, the average number of males that use the leks on the Baker County property is 12 males for this 4-year period. In order to estimate the number of sage-grouse that use the Baker County property, we used the same assumptions used by the ODFW as described in Hagen 2011. These assumptions are that the males observed on the leks during surveys represent 75% of the males in the area and that there are 1.66 females per male (Hagen 2011). Therefore, the average number of sage-grouse that use the Baker County property is 43 sage-grouse (12 males / 0.75 male lek attendance = 16 males + (16 x 1.66 female per male) = 16 males + 27 females = 43 birds). This equates to a density of 0.0117 birds/acre (43 birds / 3,662 acres).

Elevations range from 4,130 to 5,250 feet on the property. Major land forms include north-south trending drainages, with adjacent ridgelines characterized by shallow soils. Vegetation on the property consists of small patches of low sagebrush with an understory of primarily Sandberg bluegrass (*Poa segunda*) on the ridgetops, with mountain big sagebrush and an understory of large perennial bunchgrasses such as bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), and Thurber's needlegrass (*Achnatherum thurberianum*) in the deeper soil sites. In the drainages, basin big sagebrush is common. Scattered western juniper (*Juniperus occidentalis)* trees occur throughout the property (Phase I), with higher concentrations of juniper in the drainages and on the southwestern edge of the property; the southwestern edge of the property is Phase II and III juniper and conifer woodland. Several intermittent streams bisect the property, generally flowing along a northern route through the property. There are no perennial springs or wet meadows on the enrolled lands. Few invasive species (i.e. cheatgrass) occur on the enrolled lands. Figure 2 shows the location and boundaries of the Baker County property. Figure 3 shows the habitat viability (i.e. relative capability of the land to support sage-grouse) of the enrolled lands from Hagen (2011).

The enrolled lands have perimeter fencing on the entire acreage and border irrigated lands. Currently, there are no powerlines traversing the property. One well-travelled public gravel road runs from the north boundary to south boundary (Forest Service Rd 1682), and runs adjacent to the leks. Various other roads and trails are evident on the property, but are only lightly used. Most of the observed and documented sage-grouse use occurs east of Forest Service Rd 1682.

### *9.1.2 Land Use History*

The Baker County property has been owned by the same owner for over 30 years. Seasonal livestock grazing has been the primary use occurring on the property for the past 100 years. However, Bill and Nancy Moore have leased the Baker County property from the owner for the last ten years and maintain a long-term lease agreement with the owner. Under Moore's management, grazing duration and livestock numbers are adjusted annually, corresponding to annual precipitation and growing season conditions (i.e. snow pack and heat units during the growing season). Historically, fires near the property have occurred on a 75 to 100 year cycle, but during the last century fires have been controlled at 5 to15 acres. The last fire in the area occurred in 2005 or 2006 and burned less than 10 acres.

### *9.1.3 Current Property Uses and Management Practices*

Current and anticipated management activities on the Baker County property include cattle grazing, annual fence maintenance, periodic maintenance on the ditch system that feeds the stock ponds (involves blading ditches to remove brush and sediment), periodic maintenance on springs and stock ponds (as needed), and traffic on horseback, pickup, and all-terrain vehicles (ATVs) to salt and check cattle. Periodic weed control will also be conducted, as needed.

### *9.1.4 Current Condition of Enrolled Lands*

Habitat indicators are used to characterize the environment in terms of suitability for shelter, food, water and space. Indicators are based on scientific research findings and should be quantitatively repeatable for data summarization and to avoid bias. Based on extensive research in many western states, Connelly *et al.* (2000) developed and Hagen *et al.* (2007) refined habitat

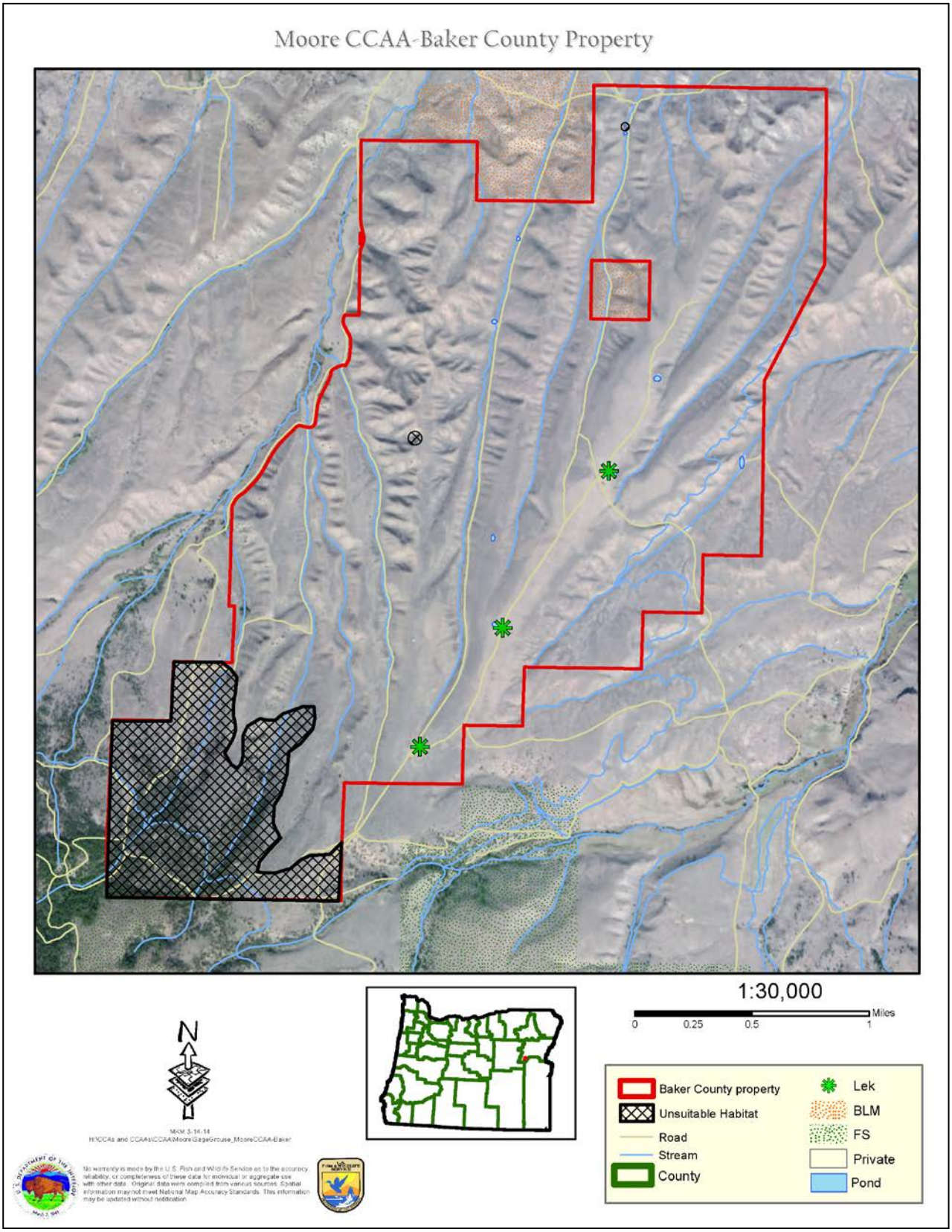


**Figure 2. Map of enrolled lands in Baker County, Oregon.**

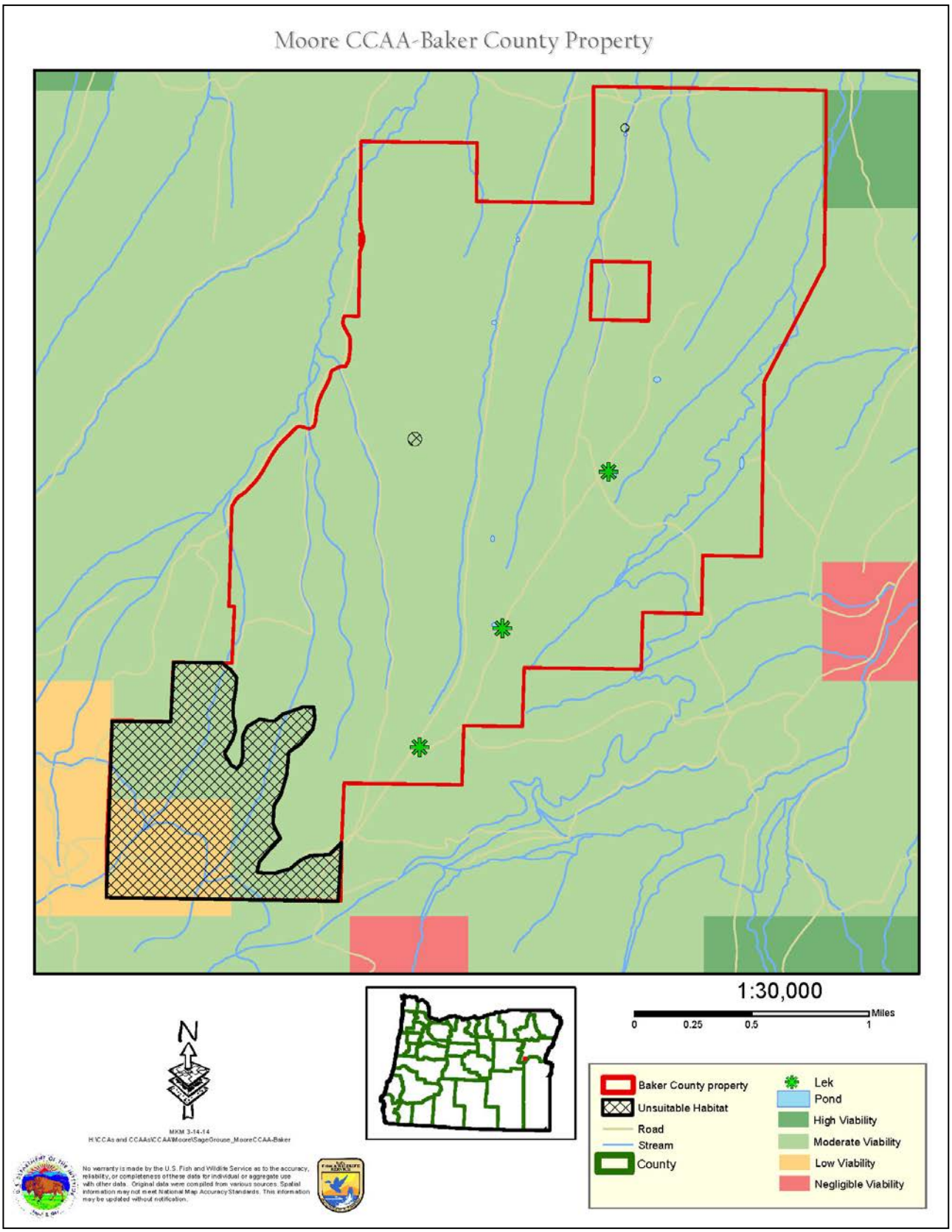


**Figure 3. Map of habitat viability (from Hagen 2011) on the enrolled lands in Baker County, Oregon.**

indicators required by sage-grouse for specific seasonal needs (leks, breeding, summer/brood-rearing, and wintering). It is important to remember that the numeric values described for productive habitat by Connelly *et al.* (2000) are guidelines and are not intended to be used as standards or strict prescriptions. Moreover, ecological site potential should be considered at the site-scale. Because of gaps in our knowledge and regional variation in habitat characteristics, the judgment of local biologists and quantitative data from population and habitat monitoring are necessary to implement the guidelines correctly (Connelly *et al.* 2000).

Despite the extensive amount of research on habitat use by sage-grouse and the design of management guidelines (Connelly *et al.* 2000), there is still controversy regarding some of the basic information on habitat use (Schultz 2004, Hagen *et al*. 2007). One reason for this controversy appears to be misinterpretation in the data used to design the original management guidelines (Connelly *et al.* 2000), as well as a lack of understanding of the role variance and scale play in observations of grouse at specific use sites versus the decisions land managers make (Stiver *et al.* 2006). These issues point to the need for additional research and monitoring that can inform habitat assessments and land management decisions potentially affecting sage-grouse and land use practices. However, at this time the Service believes the habitat indicators and associated values in Stiver *et al.* (2010) are based on the best available science. Habitat suitability values from Stiver *et al.* (2010) are as follows:

- **Suitable habitats -** provide the appropriate protective cover (sagebrush and herbaceous plants), food (forbs and sagebrush), and security (proximity of trees and tall structures for predators) needs to survive and reproduce (Connelly *et al*. 2000, Sather-Blair *et al*. 2000).
- **Marginal habitats -** include habitat components to support sage-grouse but habitat conditions are lower in quality compared to suitable habitats. It is assumed that survival rates and reproduction are lower in marginal habitats compared to suitable habitats (Cooperrider *et al*. 1986, Morrison *et al*. 1998).
- **Unsuitable habitats -** currently missing one or more basic life requisites of food or shelter, though they may have the potential to provide these life requisites in the future.

The current condition and estimated quality of sage-grouse habitat on the Baker County enrolled lands is described in Table 1.

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**Table 1. Current Condition and Quality Estimate for the enrolled lands in Baker County, Oregon.**

| Habitat Type | # Acres or # Leks | Qualitative Description of Quality (Average)[1] | Describe Connectivity or Location Relative to Other Seasonal Uses |
|---|---|---|---|
| Lek | 3 | Suitable | Leks are connected to probable nesting habitat (off enrolled lands) |
| Late brood-rearing | 3,237 acres<br>425 acres | ¾ Suitable;<br>¼ Unsuitable | Summer (late brood-rearing) habitat is connected to probable nesting (off enrolled lands), early brood-rearing habitat (off enrolled lands), and winter habitat (enrolled lands); unsuitable habitat is in SW corner. |
| Winter | 3,237 acres<br>425 acres | ¾ Suitable;<br>¼ Unsuitable | Winter habitat is connected to probable nesting (off enrolled lands), early brood-rearing habitat (off enrolled lands), and late brood-rearing habitat (enrolled lands); unsuitable habitat is in SW corner. |

[1] Based on the three habitat suitability conditions: suitable, marginal, unsuitable (see Stiver *et al*. 2010).

## *9.2 Malheur County Property*

### *9.2.1 General Description*

The Malheur County property consists of approximately 3,628 acres of land. The Malheur County property lies approximately seven miles southwest of Brogan, Oregon. The property falls entirely within ODFW Core sage-grouse habitat (also referred to as preliminary preferred habitat (PPH) or Priority Areas for Conservation (PAC), with the closest sage-grouse lek approximately five miles south of the property. The birds that use the property belong to the Western Great Basin population (Garton *et al.* 2011). The property also falls within the Vale District population in Oregon (Hagen 2011) and Management Zone V (Stiver *et al*. 2006). Figure 4 shows various views from the Malheur County property.

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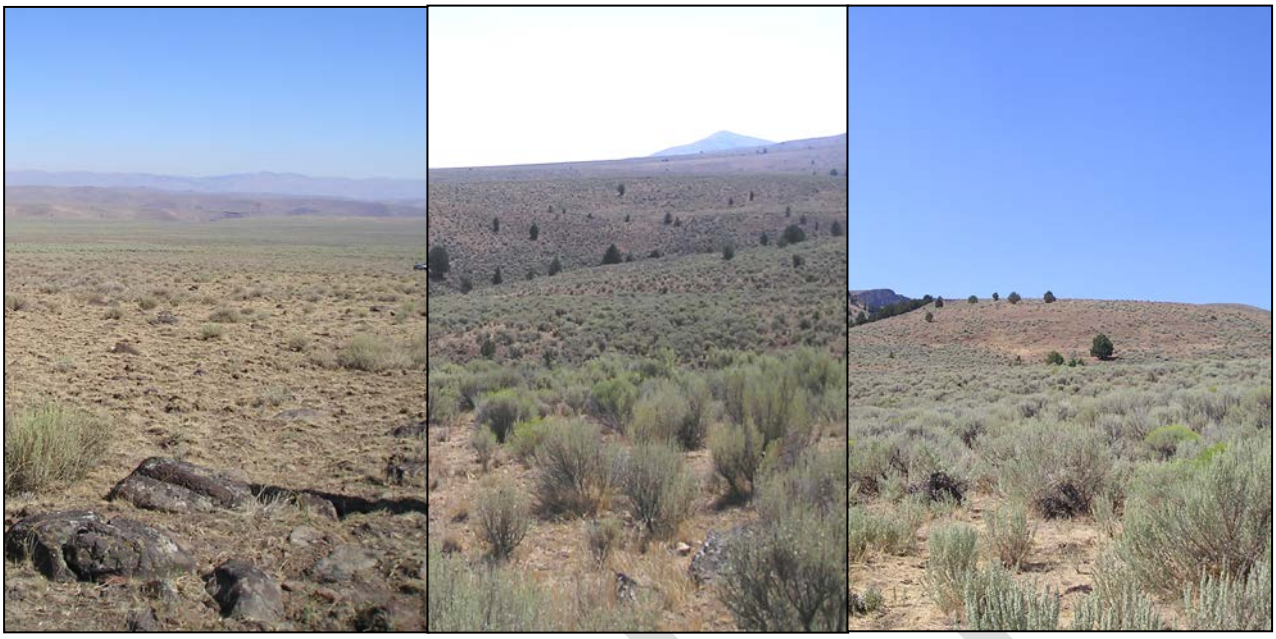

**Figure 4. Representative views from the three pastures in the Malheur County property, Malheur County, Oregon.**

No lek data or site-specific information on the number of sage-grouse that use the Malheur property are available. Therefore, the Service used statewide population estimates and the amount and type of sage-grouse habitat (PPH) available on the Malheur property to estimate the number and density of sage-grouse. The density of sage-grouse for the Malheur County property was calculated as follows. There are an estimated 24,515 sage-grouse in Oregon based on a 10-year (2004-2013) average of the statewide total spring population (ODFW unpublished data 2013). According to Hagen (2011) 90% of sage-grouse occupy PPH (i.e. Malheur County property), which is estimated at 6.57 million acres in Oregon. Using the 10-year minimum breeding population average, sage-grouse densities in PPH are estimated at 0.0034 birds per acre (90% of 24,515 = 22,064 sage-grouse divided by 6.57 million acres of PPH) (Table 3, below). This statewide average density was then multiplied by the number of acres of PPH (3,628 ac x 0.0034 birds per ac) covered under this CCAA to come up with an estimated 10-year minimum population average of 12 sage-grouse for the Malheur County property.

Elevations on the property range from 3,980 to 5,800 feet. Major land forms include northwest-southeast trending drainages, with Cottonwood Mountain crossing through the southern portion of the property. The property has intermixed deep and shallow soil types. Vegetation on shallow soil sites is dominated by low sagebrush with an understory of primarily Idaho fescue, Sandberg bluegrass, and bluebunch wheatgrass. Deeper soil sites are dominated by Wyoming big sagebrush, mountain big sagebrush and an understory of large perennial bunchgrasses such as bluebunch wheatgrass, Idaho fescue, and Thurber's needlegrass. Scattered patches of basin big sagebrush are also common in deeper soils and in the drainages. Scattered western juniper trees (Phase I) occur below the main road that bisects the property, with higher concentrations of juniper (Phase II ) above the road towards the southwestern edge of the property. The mountain in the southwestern portion of the property (Cottonwood Mountain) also has pockets of curl-leaf

mountain mahogany (*Cercocarpus ledifolius*), antelope bitterbrush (*Purshia tridentata*), spiny hopsage (*Grayia spinosa*), serviceberry (*Amelanshier alnifolia*), and hackberry (*Celtis ssp.*). Several intermittent streams bisect the property generally flowing along a northeastern route through the property. These intermittent streams have willow, alder, juniper and sagebrush along the stream, with aspen higher in the drainages. Few weeds and invasive species (e.g., cheatgrass and Scotch thistle) occur on the enrolled lands. Figure 5 shows the location and boundaries of the Malheur County property. Figure 6 shows the habitat viability of the enrolled lands from Hagen (2011). Figure 5 shows the location and boundaries of the Malheur County property. Figure 6 shows the habitat viability of the enrolled lands from Hagen (2011). Figure 5 shows the location and boundaries of the Malheur County property. Figure 6 shows the habitat viability of the enrolled lands from Hagen (2011).

The property has one home site, with associated corrals and outbuildings. The property has perimeter fencing and two interior cross-fences. Currently, there are no powerlines on the property. One relatively well-used dirt road crosses the property, running northwest to southeast, and is used by locals to access hunting opportunities. Various other roads and trails are also evident on the property, but are only lightly used.

### *9.2.2 Land Use History*

The Malheur County Property has been under continuous family ownership since 1933. The property has been used for livestock grazing every year since 1933 and probably for at least 40-50 years prior to 1933. Portions of the property were hayed from 1933 to 1941. In 1941, the fields were abandoned when the focus was switched from farming to supporting the war effort. Storms that moved through the area after the fields were abandoned downcut most of the streams on the property and nearby areas. In addition, chemical brush control has been done on portions of the property; no brush control has been conducted since 1976 or 1977. This area historically would burn once every 75 to 100 years, but there have been no significant fires on this property since 1933.

### *9.2.3 Current Property Uses and Management Practices*

Under the current management, grazing duration and livestock numbers are adjusted annually, corresponding to annual precipitation and growing season conditions (i.e. snow pack and heat units during the growing season). Current and anticipated management activities for the Malheur County property include cattle grazing, annual fence and spring maintenance, and traffic on horseback, pickups, and ATVs to salt and move cattle. Periodic weed control will also be conducted, as needed.

### *9.2.4 Current Condition of Enrolled Lands*

This section describes the habitat suitability and ecological site potential of the enrolled property. Habitat suitability values from Stiver *et al.* (2010) are as follows:

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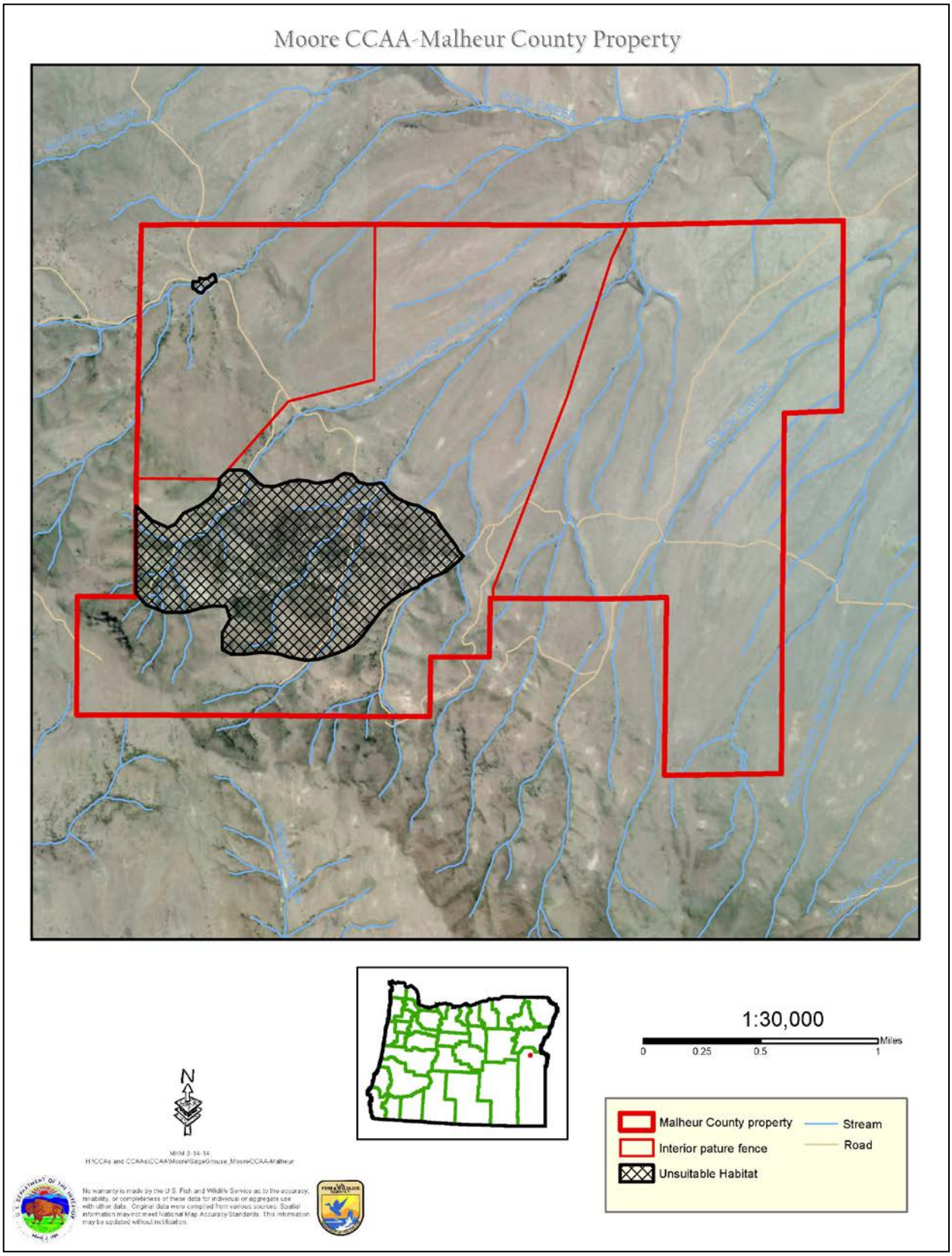


**Figure 5. Map of enrolled lands in Malheur County, Oregon.**

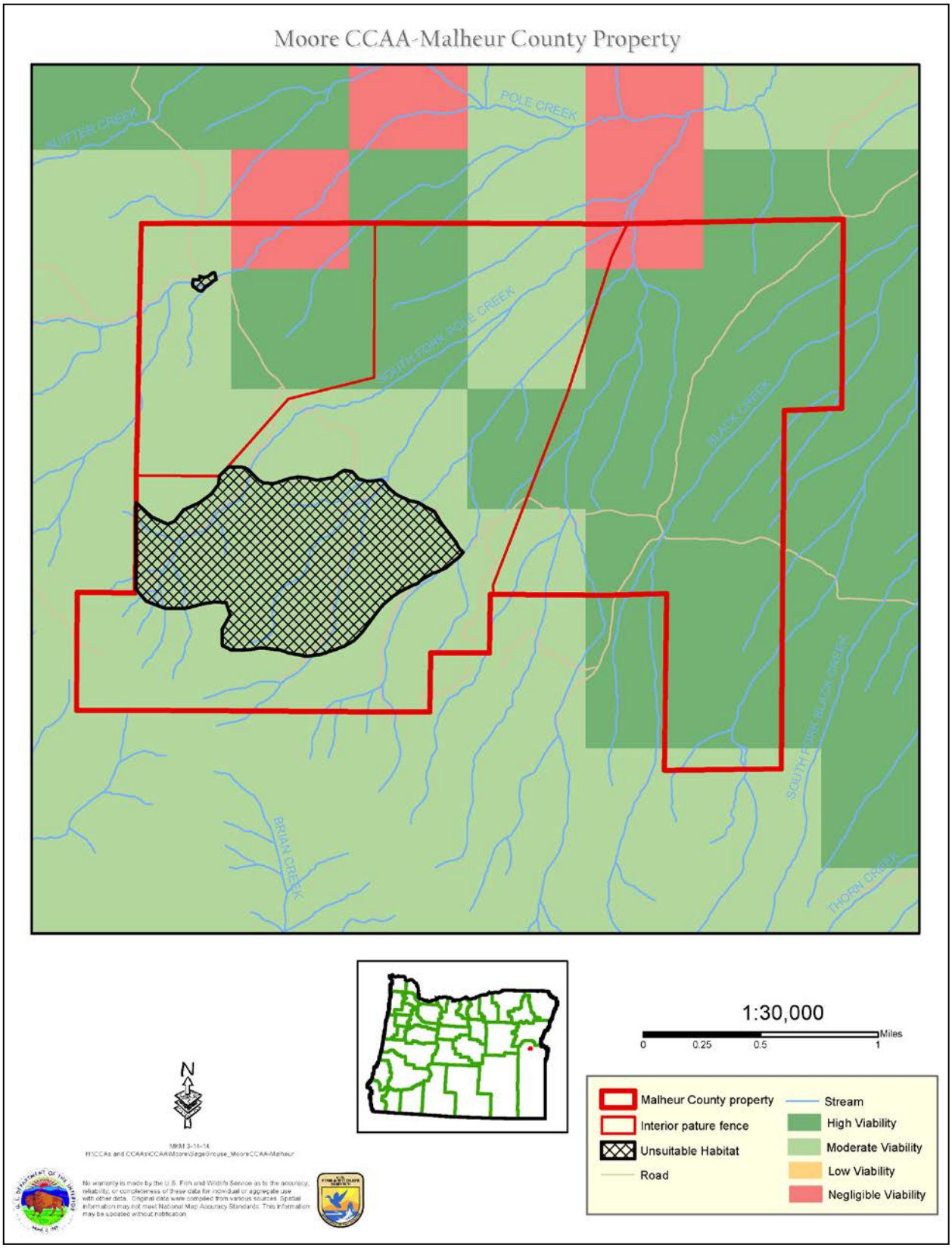


**Figure 6. Map of habitat viability (from Hagen 2011) on the enrolled lands in Malheur County, Oregon.**

- **Suitable habitats -** provide the appropriate protective cover (sagebrush and herbaceous plants), food (forbs and sagebrush), and security (proximity of trees and tall structures for predators) needs to survive and reproduce (Connelly *et al*. 2000, Sather-Blair *et al*. 2000).
- **Marginal habitats -** include habitat components to support sage-grouse but habitat conditions are lower in quality compared to suitable habitats. It is assumed that survival rates and reproduction are lower in marginal habitats compared to suitable habitats (Cooperrider *et al*. 1986, Morrison *et al*. 1998).
- **Unsuitable habitats -** currently missing one or more of the basic life requisites of food or shelter, though they may have the potential to provide these life requisites in the future.

The current condition and estimated quality of sage-grouse habitat on the Malheur County enrolled lands is described in Table 2.

**Table 2. Current Condition and Quality Estimate for the enrolled lands in Malheur County, Oregon.**

| Habitat Type | # Acres | Qualitative Description of Quality (Average)[1] | Describe Connectivity or Location Relative to Other Seasonal Uses |
|---|---|---|---|
| Late brood-rearing | 3,157 acres<br>471 acres | ¾ Suitable;<br>¼ Unsuitable | Summer (late brood-rearing) habitat is connected to probable nesting (off enrolled lands), early brood-rearing habitat (off enrolled lands), and winter habitat (enrolled lands); unsuitable habitat is in juniper woodland and at home site |
| Winter | 3,157 acres<br>471 acres | ¾ Suitable;<br>¼ Unsuitable | Winter habitat is connected to probable nesting (off enrolled lands), early brood-rearing habitat (off enrolled lands), and late brood-rearing habitat (enrolled lands); unsuitable habitat is in juniper woodland and at home site |

[1] Based on the three habitat suitability conditions: suitable, marginal, unsuitable (see Stiver *et al*. 2010).

# 10. CONSERVATION MEASURES

The CMs described below are designed to reduce threats to sage-grouse on the enrolled lands. These CMs are derived from existing guidelines for managing sage-grouse populations and their habitats issued by the Bureau of Land Management (BLM) (2004, 2011), Western Association of Fish and Wildlife Agencies (Connelly *et al.* 2000), ODFW (Hagen 2011), and an interagency team of managers, fire ecologists, range conservations, and wildlife biologists from the BLM, Service, Forest Service, ODFW, and Oregon Department of State Lands (BLM *et al.* 2000). These guidance documents encourage the application of the best available scientific knowledge, anecdotal information, and professional judgment of local BLM personnel, state wildlife agency biologist, and local sage-grouse working groups to manage and restore sagebrush habitats.

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The Service recognizes that each parcel of land is unique, and the appropriate CMs to use on those parcels are site-dependent. Therefore, the Service has worked with the Landowners to identify the specific threats to sage-grouse on the enrolled lands and select CMs that remove or reduce the threats on those enrolled lands. The following specific CMs are based on the specific threats that have been identified for the enrolled lands:

- Habitat fragmentation;
- Wildfire;
- Juniper and conifer expansion;
- Livestock management;
- Invasive vegetation; and
- Recreation.

The Landowners will maintain or improve upon the existing conditions for sage-grouse by addressing the above threats in order to provide an overall conservation benefit to sage-grouse from implementation of this CCAA. The Landowners are currently implementing many of the CMs below, and agree to continue to implement them, as well as new CMs. The CMs will occur on the Baker County Property (**BCP**) or the Malheur County Property (**MCP**) as identified below:

## *10.1 Habitat Fragmentation*

**Threat: Fragmentation of the landscape -** Fragmentation of the landscape causes sage-grouse to leave leks or abandon nests or important habitats (i.e. direct impact to nests and brooding hens), resulting in decreased reproductive success.

**Conservation Objective:** Maintain a minimum of 3,237 acres (**BCP**) and 3,157 acres (**MCP**) of contiguous sagebrush habitat for the next 30 years.

**Conservation Measures:**

1. Continue current management by avoiding further fragmentation from development or habitat conversion (e.g., roads, powerlines, energy development, sagebrush removal, conversion to non-native grasses). (**BCP**), (**MCP**)

**Effectiveness Monitoring:** Examine recent aerial photography and/or conduct site visits to assess habitat contiguity at least once every five years.

**Rationale:** Habitat loss and fragmentation is the greatest threat to sage grouse in Oregon (USFWS 2010). However, the enrolled lands currently contain contiguous sagebrush habitat. The acreage in the objective consists of both properties (all enrolled lands) with the exception of approximately 425 acres of juniper woodland on the Baker County property and approximately 468 acres of juniper woodland and 2.5 acres that have been cleared for one home site, corrals and outbuildings on the Malheur County property. The roads and trails on the properties are unpaved, narrow, and not well-traveled enough to be a significant source of habitat fragmentation. The CM is intended to maintain large acreages of contiguous sagebrush habitat, free from development or habitat conversion.

## *10.2 Wildfire*

**Threat: Wildfire -** Wildfires remove long-lived species such as sagebrush, thereby, reducing sage-grouse habitat quality and quantity.

**Conservation Objectives:** (1) Minimize the likelihood of a large fire (> 10 acres) burning through the enrolled lands over the next 30 years; and (2) Maintain or increase current native

grass and forb canopy cover on 3,237 acres (**BCP**) and 3,157 acres (**MCP**) over the next 30 years.

**Conservation Measures:**

2. Continue to participate in the Ironside Rural Fire Protection District with initial attack to protect existing or potential sage-grouse habitat. (**MCP**)
3. Continue to provide equipment and personnel for initial attack to protect existing or potential sage-grouse habitat, where possible. (**BCP**), (**MCP**)
4. Continue to encourage the use of direct attack tactics (when safe) to reduce the amount of burned habitat. (**BCP**), (**MCP**)
5. Continue to utilize livestock grazing while maintaining at least 5-15% native grass canopy cover (taken from Stiver *et al.* 2010). (**BCP**), (**MCP**)

**Effectiveness Monitoring:** Assess fuel loads annually in association with photo point monitoring, and in more detail, at least every five years in association with quantitative vegetation assessments. Maintain a record of fire history (e.g., fire starts, causes, areas burned) on and within five miles of the enrolled lands to evaluate possible prevention strategies.

**Rationale:** Wildfires can remove long-lived species such as sagebrush and native grasses and forbs, thereby reducing sage-grouse habitat quality and quantity (USFS 2010). However, sagebrush habitats that consist of primarily native grass species in the understory are quicker to recover from wildfires and are more resilient to weed invasions (Davies 2008; Davies *et al.* 2010; Davies *et al.* 2011). A rapid assessment of the enrolled lands indicates the current canopy cover of native grasses and forbs fall within the 'Suitable' and/or 'Marginal' categories for the grass and forb canopy cover habitat indicator described in Stiver *et al.* (2010). The CMs are intended to maintain or improve the current conditions of the enrolled lands, prevent wildfires from removing large acreages of sagebrush habitat, and to minimize impacts from any wildfires that may burn through the enrolled lands through rapid response, managing fuel loads, and maintaining sagebrush habitat with a healthy understory of native grass and forb species.

## *10.3 Juniper and Conifer Expansion*

**Threat: Juniper/Conifer Expansion -** Juniper/conifer encroachment can lead to a reduction of sage-grouse habitat and/or a reduction in use of that habitat, or habitat abandonment. In addition, improper treatment of slash from mechanical or chemical removals may continue to compromise habitat use.

**Conservation Objective:** (1) Remove visible juniper and conifer trees encroaching on sage-grouse habitats on 1,500 acres (**BCP**) and 2,000 acres (**MCP**) within five years (to the extent funding is available) and an additional 1,737 acres (**BCP**) and 1,157 acres (**MCP**) within 10 years (to the extent funding is available); and (2) Maintain approximately 3,237 acres (**BCP**) and 3,157 acres (**MCP**) with no visible juniper or conifer trees for the remainder of the 30-year timeframe after the initial juniper and conifer removal (to the extent funding is available). The MCP acres exclude approximately 400 acres of old growth juniper.

**Conservation Measures:**

6. Continue to work with agency specialists to determine need for treatment and, if needed, the appropriate method (e.g., chainsaw, heavy machinery, prescribed fire, or a combination). Choose methods that will minimize or prevent soil sterilization and methods least likely to result in weed invasions. (**BCP**), (**MCP**)

7. Treat/remove encroaching juniper/conifer in sage-grouse habitats. Consider juniper succession stage (Phase I, II, or III), site conditions, and proximity to suitable habitat when selecting removal and post-treatment methods. Concentrate treatments in plant communities with intact understory vegetation (i.e. juniper succession Phase I & II). (**BCP**), (**MCP**)
8. Ensure timing of juniper/conifer treatment/removal does not interfere with lekking or other known seasonal movements of sage-grouse or other critical sage-grouse habitat features (e.g., wintering habitat)
9. Fell and leave Phase I juniper < 2 m (6 ft). Limb any branches >1.5 m (4 ft) in height on a felled tree (i.e. lop and scatter). (**BCP**), (**MCP**)
10. Treat/remove encroaching juniper/conifer within existing riparian and transitional zones. (**BCP**), (**MCP**)
11. Work with agency specialists to plan prescribed fire treatments to address timing (e.g. spring burn versus fall), whether the treatment is appropriate and can meet the objectives to limit invasive species and to ensure critical sage-grouse habitat features (e.g., wintering habitat, and lek sites) will not be removed, as well as importance of the potential habitat treatment to sage-grouse. (**MCP**)
12. Conduct spring burns (Mar-Apr), when soils tend to be frozen but the moisture content of the felled trees is low, for Phase I and Phase II where jackpot burning is the most appropriate method of slash removal. Ensure timing of these actions does not interfere with lekking or other known seasonal movements of sage-grouse. Burns should be conducted while needles are still on the felled trees (usually within two years of felling). (**MCP**)
13. Conduct broadcast burning of juniper-invaded sagebrush judiciously and such that only one-third of the treatment area is burned. Once sagebrush has begun to recruit, a broadcast burn can be conducted for another one-third of the treatment area, and so on for the final third of the area. (**MCP**)
14. Seed juniper treatments (with seed mixes agreed upon by both signatories) when current perennial grass community is in poor condition (<2 plants /10ft$^2$, <1 plant/10ft$^2$ on dry and wet sites) or if exotic annual grasses are present. Broadcast seeding prior to soil disturbance or under slash may increase the chances of establishment. (**MCP**)
15. Remove juniper encroaching from mountain big sagebrush communities through cutting of juniper and burning piled trees and limbs ("jack-pot burning," which involves returning to juniper piles when the ground is frozen or saturated to conduct a light burn), or other methods that are mutually agreed upon by the Landowners and the Service. (**BCP**), (**MCP**)

**Effectiveness Monitoring:** Examine recent aerial photography and/or conduct site visits to assess the extent of juniper and conifer encroachment at least once every five years.

**Rationale:** Juniper and conifer encroachment can lead to a reduction of sage-grouse habitat, a reduction in use of that habitat, or habitat abandonment (USFS 2010). Sage-grouse start limiting their use of an area when juniper canopy cover reaches five percent (Freese 2009). The enrolled lands have juniper and conifer encroaching, both Phase I (**BCP** and **MCP**) and Phase II (**MCP**), on sage-grouse lekking, breeding, brood-rearing and wintering habitats. The CMs are intended to restore large acreages of sagebrush habitat and minimize impacts from juniper and conifer removal through the appropriate use of juniper removal techniques and maintaining sagebrush habitat with a healthy understory of native grass and forb species.

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## *10.4 Livestock Management*

**Threat:** Livestock, humans and vehicles can physically disturb and cause birds to leave leks resulting in decreased reproductive success. Additionally, improperly managed livestock grazing can indirectly affect sage-grouse by manipulating vegetation including changes in shrub and herbaceous (native grasses and forbs) cover; amount of residual herbaceous cover to conceal sage-grouse nests and broods from predation; and plant community compositions.

**Conservation Objectives:** (1) Minimize disruptions to lekking activity within 0.6 miles of known (**BCP**), and any new (**BCP** and **MCP**), leks sites over the next 30 years; and (2) Maintain or improve current shrub canopy cover and maintain or increase current native grass canopy cover on 3,237 acres (**BCP**) and current shrub canopy cover and maintain or increase current native grass canopy cover on 3,157 acres (**MCP**) over the next 30 years.

**Conservation Measures:**

16. Continue to minimize off-trail vehicular travel in sage-grouse habitat from March 1 through June 30 unless travel is essential for routine ranch activities (e.g., repairing fence, "doctoring" livestock, finding lost livestock, and irrigation activities). (**BCP**), (**MCP**)
17. Continue to minimize disruptive activities one hour before sunset to two hours after sunrise from March 1 to May 1 within 0.6 mile of the perimeter of occupied leks, unless brief occupancy is essential for routine ranch activities. Examples of disruptive activities may include noise, human foot or vehicle traffic, or other human presence. May 1 is historically when sage-grouse are no longer present on the property. (**BCP**)
18. Continue to avoid concentrating livestock in or near leks from March 1 through May 1. May 1 is historically when sage-grouse are no longer present on the property. The timing and location of livestock turnout and trailing should not contribute to livestock concentrations on leks during the sage-grouse breeding season. (**BCP**)
19. Continue to adjust livestock use (season of use, timing, intensity, and/or duration) to reduce the impact on perennial herbaceous cover, plant diversity, and plant vigor that enables enrolled lands to meet the seasonal habitat needs for sage-grouse identified for the site (see **Appendix C** pages 55-64 for description of seasonal habitat requirements). (**BCP**), (**MCP**)
20. Continue to move salting locations annually, and strategically, to minimize impacts to sage-grouse habitat. (**BCP**), (**MCP**)
21. Ensure all water troughs have wildlife escape ramps properly installed. (**BCP**), (**MCP**)
22. Manage grazing in riparian areas or wet meadows to ensure channel stability, to allow riparian wetland vegetative cover to protect stream banks, and to prevent excessive use of woody riparian species. (**MCP**)
23. Construct or modify spring developments to maintain free-flowing and wet meadow characteristics within first five years (to the extent funding is available). (**MCP**)
24. Mark the approximate 0.5 to 1.0 mile of fence near the known lek sites within first five years. (refer to model by Stevens 2011) (**BCP**)

**Effectiveness Monitoring:** Maintain a record of livestock management operations (e.g., timing and location of turnout, fence maintenance) on the enrolled lands to evaluate possible adaptive management strategies. Examine photo point photographs annually and conduct site visits to assess habitat composition at least once every five years.

**Rationale:** Disturbance from livestock, humans and vehicles can cause birds to leave leks or abandon nests and decrease reproductive success (Patterson 1952; Call and Maser 1985; Holloran and Anderson 2003). Additionally, livestock grazing can indirectly affect sage-

grouse by manipulating vegetation cover and densities, as well as changing plant community compositions. Seasonal livestock grazing, and related livestock management activities, occur on the enrolled lands. A rapid assessment of the enrolled lands indicates the current canopy cover of native grasses and shrubs fall within the 'Suitable' and/or 'Marginal' categories for the grass canopy cover habitat indicator described in Stiver *et al.* (2010). The CMs are intended to maintain and improve current condition of the enrolled lands, and prevent disturbances to sage-grouse and minimize impacts to sage-grouse habitat from grazing through minimizing disturbances during critical periods (i.e. breeding and wintering), and managing livestock use in a manner that maintains healthy sagebrush habitat with an understory of native grasses and forbs.

## *10.5 Invasive Vegetation*

**Threat: Invasive and/or Exotic Vegetation -** Establishment of plant communities that do not provide suitable habitat (e.g., introductions and monocultures of non-native, invasive plants) reduce sage-grouse habitat quality and quantity.

**Conservation Objective:** (1) Prevent and control invasive plant infestations; and (2) Maintain or improve current shrub canopy cover and maintain or increase current native grass canopy cover on 3,237 acres (**BCP**) and current shrub canopy cover and maintain or increase current native grass canopy cover on 3,157 acres (**MCP**) over the next 30 years.

**Conservation Measures:**

25. Continue to work with County weed experts and agencies to ensure correct identification of invasive weeds that are a threat to the enrolled lands. (**BCP**), (**MCP**)
26. Continue to work with Weed Boards, Weed Districts, Oregon State University Extension Service, and/or other local experts as necessary to establish weed prevention areas and to implement treatments. (**BCP**), (**MCP**)
27. Continue to aggressively treat noxious weeds (see Oregon's state noxious weed list found at www.oregon.gov/ODA/plant/weeds/Pages/statelist12.aspx) and other invasive plants where they threaten quality of sage-grouse habitat and apply best management practices to prevent infestations from occurring. (**BCP**), (**MCP**)
28. Treat existing livestock concentration areas to reduce Scotch thistle. (**MCP**)
29. Report any new annual grass or noxious weed (e.g., cheatgrass and medusahead) infestations to the Service (applies to monocultures of 1 acre or larger) (**BCP**), (**MCP**)

**Effectiveness Monitoring:** Examine photo point photographs annually and conduct site visits to assess habitat composition at least once every five years.

**Rationale:** Invasive vegetation reduces the quality and quantity of sage-grouse habitat (Connelly *et al.* 2000). Healthy sagebrush habitats with intact native grass understories are more resistant and resilient to the establishment of invasive vegetation (Davies 2008; Davies *et al.* 2010; Davies *et al.* 2011). Currently, the enrolled lands do not contain monocultures of non-native, invasive plants; however, areas with scattered cheatgrass and small pockets of Scotch thistle are present. The CMs are intended to prevent the establishment of invasive vegetation from invading sage-grouse habitat through rapid response and maintaining sagebrush habitat with a healthy understory of native grasses and forbs.

## *10.6 Human Disturbance*

**Threat: Human Disturbance -** Repeated disturbance and harassment of sage-grouse could reduce mating and reproductive productivity.

**Conservation Objective:** Minimize human-caused disruptions within 0.6 miles from the perimeter of lekking activity at known (**BCP**), and any new (**BCP** and **MCP**), lek sites over the next 30 years.

**Conservation Measure:**

30. Continue to post private property and no trespassing signs to discourage public off-road travel near known lek sites. (**BCP**), (**MCP**)
31. Continue to minimize disruptive activities one hour before sunset to two hours after sunrise from March 1 to May 1 within 0.6 mile of the two known leks, unless brief occupancy is essential for routine ranch activities (e.g., repairing fence, "doctoring" livestock, finding lost livestock). Examples of disruptive activities may include noise, human foot or vehicle traffic, or other human presence. May 1 is historically when sage-grouse are no longer present on the property. (**BCP**), (**MCP**)
32. Continue to work with Malheur County, adjacent landowners, and the Service in pursuing seasonal (or permanent) closures for public access on the main road that bisects the property. The road provides access to private lands only, provides poachers (both sage-grouse and big game) with access to private lands that are infrequently visited or patrolled, and increases the amount of disruption and disturbance to sage-grouse in area. (**MCP**)
33. Continue to work with Malheur County, Oregon State Police, ODFW, adjacent landowners, and the Service to increase law enforcement patrol on the enrolled lands. The road provides access to private lands only, and provides poachers (both sage-grouse and big game) with access to private lands that are infrequently visited or patrolled, and increases the amount of disruption and disturbance to sage-grouse in area. (**MCP**)
34. Follow ODFW's lek counting procedures when monitoring known lek sites. (**BCP**), (**MCP**)

**Effectiveness Monitoring:** Maintain a record of livestock management operations (e.g., timing and location of turnout, fence maintenance) and signing of private property (location and date of signing).

**Rationale:** Disturbance and harassment of sage-grouse can lead to reduced mating and reproductive productivity (Call and Maser 1985; Knight and Cole 1995; Baydack and Hein 1987). The enrolled lands have roads that are used by the public to access hunting and other recreational opportunities. The CMs are intended to minimize or eliminate disturbances to sage-grouse through the signing of private property to reduce public use of the enrolled lands, and reducing minimizing disturbances during critical periods (i.e. breeding and wintering).

# 11. FUNDING SOURCES AND IMPLEMENTATION SCHEDULE

The Service and the Landowners will be responsible for acquiring funds for conservation implementation through use of grant money or through partnerships with the Landowners, State and Federal agencies, County government, non-governmental organizations, or a combination of the above. The Service will assist through its Partners for Fish and Wildlife program, or other funding opportunities when available. The Service will also provide technical support to the Landowners applying for funding to implement CMs. Failure to complete the activities in a timely fashion may result in withdrawal of the assurances provided to the Landowners.

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CMs are anticipated to be implemented by the following dates to the extent funding is available:

- Remove visible juniper and conifer trees encroaching on sage-grouse habitats on 1,500 acres (**BCP**) and 2,000 acres (**MCP**) by the end of 2019;
- Construct or modify spring developments to maintain free-flowing and wet meadow characteristics by the end of 2019 (**MCP**);
- Mark the approximate 0.5-1.0 mile of fence near known lek sites by the end of 20189 (**BCP**);
- Remove visible juniper and conifer trees encroaching on sage-grouse habitats on additional 1,737 acres (**BCP**) and 1,157 acres (**MCP**) by the end of 2024; and
- Maintain approximately 3,237 acres (**BCP**) and 3,157 acres (**MCP**) with no visible juniper or conifer trees through the end of 2044. The MCP acres exclude approximately 400 acres of old growth juniper.

# 12. INVENTORY AND MONITORING

This section outlines the minimum compliance and biological monitoring requirements for this CCAA. This section describes the specific monitoring strategy for the enrolled lands, including a description of the methods to be used, a description of permanent monitoring locations (e.g., transects, plots, permanent photo stations), a schedule for monitoring, and a description of who is responsible for each aspect of monitoring. Monitoring will typically be completed by the Landowners with support from the Service and, if available, ODFW. Monitoring may also be completed by mutually agreed upon third parties (i.e. contracted organization or individual). The Service will coordinate site visits with the Landowners, and where appropriate and available, ODFW, to determine compliance with this CCAA or to conduct biological monitoring. Figures 7 and 8 show the established photo point and trend monitoring locations for the Baker and Malheur properties, respectively.

## *12.1 Compliance Monitoring*

The Landowners commit to annually self-reporting the implementation of the CMs in this agreement (using the compliance monitoring form provided in **Appendix B**). Additionally, the Service will organize a field review of the enrolled lands to evaluate progress toward maintaining and enhancing sage-grouse habitat and to provide an opportunity for adaptive management. Timing between the field reviews may vary; however, during the first 10 years of this CCAA, we anticipate the enrolled lands will be reviewed at least once every 3 years, or more often if there is a problem meeting the terms of this CCAA.

## *12.2 Biological and Trend Monitoring*

This section includes provisions for monitoring and reporting the CCAA‘s progress toward the expected conservation benefits. The criteria for biological monitoring do not generally relate to the implementation of the measures but, instead, relate to determining the effectiveness of the measures.

Biological monitoring will include the following (identified by property): **(1)** baseline assessment of sage-grouse habitat condition of the enrolled lands; **(2)** photo point monitoring; **(3)** quantitative assessment and trend of sage-grouse habitat condition at permanent sampling

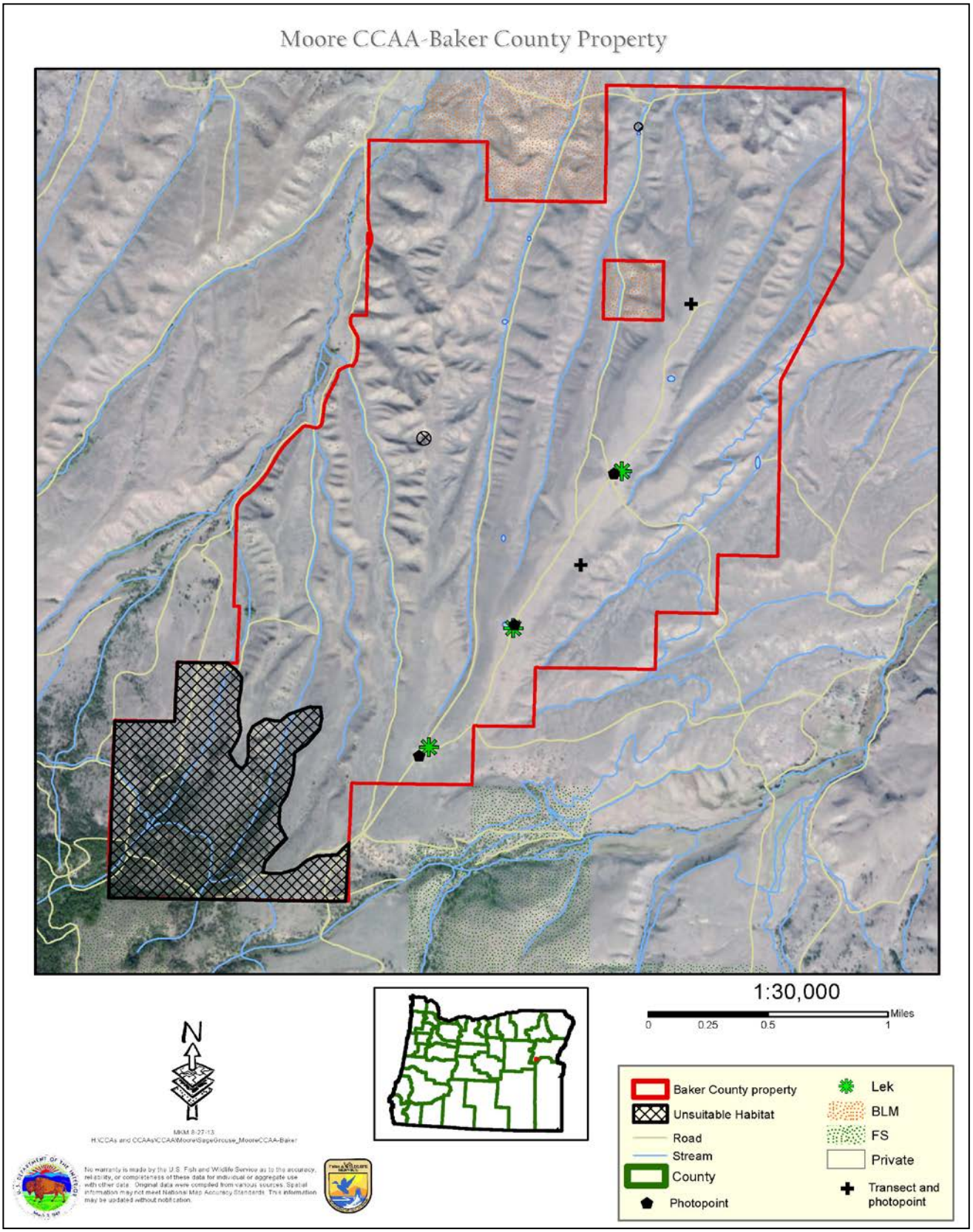
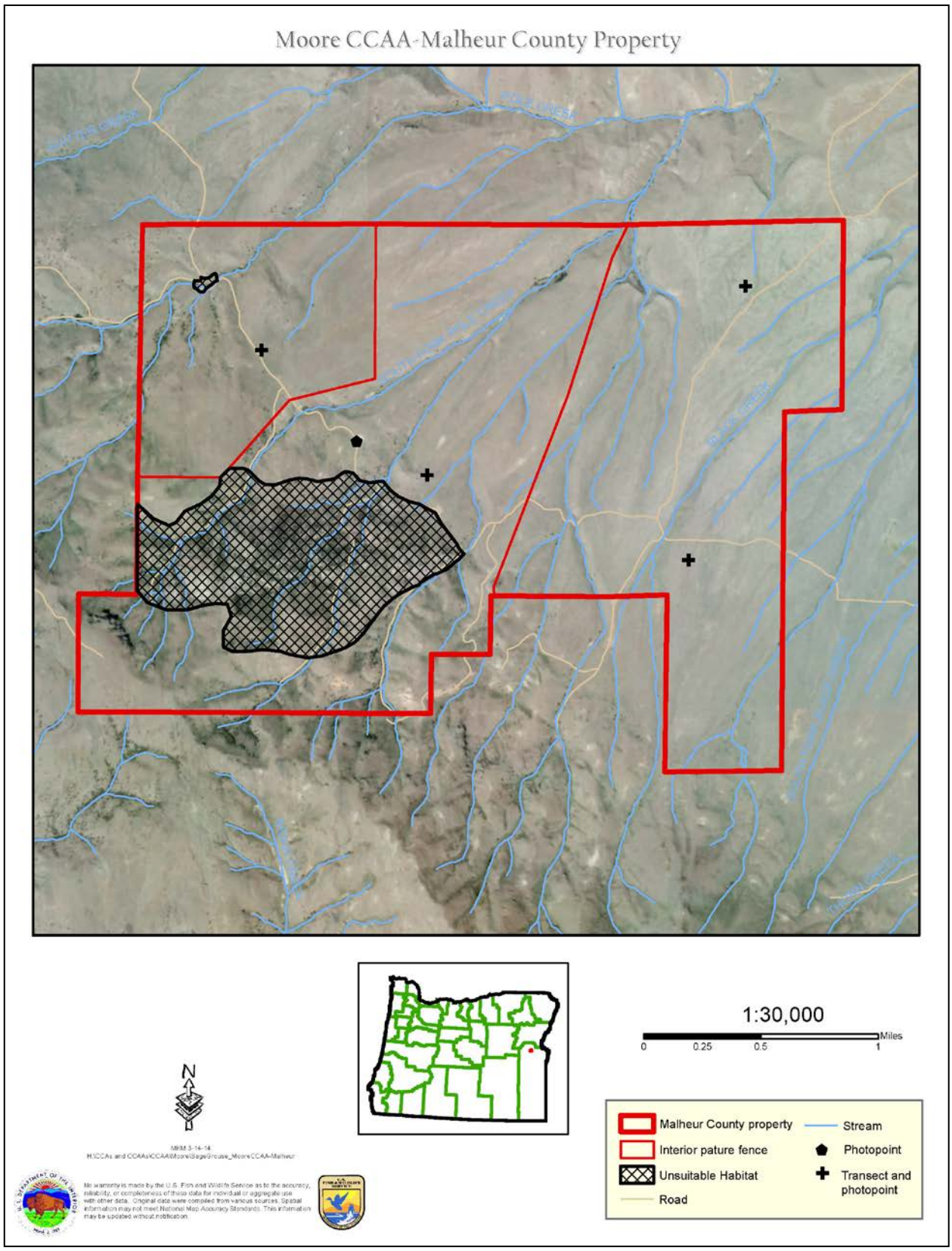



**Figure 7. Map showing established photo points and trend monitoring locations on the Baker County property, Baker County, Oregon.**




**-Figure 8. Map showing established photo points and trend monitoring locations on the Malheur County property, Malheur County, Oregon.**

locations every five years; and **(4)** sage-grouse population trend assessment based on annual lek monitoring.

1. **Sage-Grouse Habitat Assessment** (**BCP**), (**MCP**): A rapid assessment of sage-grouse habitat on the enrolled lands was conducted to establish habitat suitability, describe site potential, identify existing threats, and select the appropriate CMs for the properties. The assessment was conducted in cooperation with the Service, the Landowners, and ODFW.
    a. **Locations –** The Baker County property has two established trend locations and the Malheur County property has three established trend locations. Locations were chosen with consideration given to known or potential sage-grouse use, known or potential threats, grazing regime, fencelines, ecological sites, size, and continuity of the pasture. Baseline data for both properties will be collected by spring/early summer 2015 when forbs and grasses are the easiest to identify. Baseline data will be collected using the "site scale" analysis method, described in the Sage-Grouse Habitat Assessment Framework (Stiver *et al.* 2010; volume II, pages 25-44).
    b. **Timing** - Monitoring will be conducted in spring/early summer when forbs and grasses are the easiest to identify.
    c. **Methodology** - Point Intercept Method (at least four 50-meter transects within the two main ecological sites; measurements taken every 1-2 meters; at least 200 points per cover type should be sampled). See Stiver *et al.* 2010; volume III, pages 32-47 for complete instructions on data collection.
        i. Lay out 50-meter tape;
        ii. Take picture with transect identification information and date visible;
        iii. Drop a long (1m), small diameter pin at 1-m intervals along the transect;
        iv. Record any plant or ground cover that touches the pin (start at the top of the pin and work down, record only one hit per life form (shrub, perennial grass, perennial forb, annual grass, annual forb, litter or soil));
        v. Record 'hit' if the pin ends up in a gap less than 5 cm; and
        vi. Record life form heights and sagebrush shape.

2. **Photo Point Monitoring** (**BCP**), (**MCP**): Local sage-grouse habitat conditions on the enrolled lands will be evaluated at a minimum of every three (3) years. This evaluation will be done by the Landowners by re-taking photos at established photo points. The Landowners will also document new occurrences of noxious weeds on the enrolled lands to enable early detection and control of undesirable species.
    a. **Locations** - The Baker County property has five established photo point locations (including two trend transect locations) and the Malheur County property has five established photo point locations (including four trend transect locations).
    b. **Timing** - Baseline photos for both properties will be taken by spring/early summer 2015 at the same time the baseline habitat assessment transects are measured. Photos will be retaken at exact location and overview of the original assessment photos at least every three years (photos may be required more frequently if conditions appear to be degrading).
    c. **Methodology** - Four landscape photos and four close-up photos should be taken

(one in each cardinal direction) at the trend monitoring marker.

i. Record the date, location, and property name;
ii. Make sure landmarks are in the background for landscape photos; and
iii. Zoom in to show understory vegetation and condition for close-up photos.

3. **Periodic Quantitative Assessment** (**BCP**), (**MCP**): Sage-grouse habitat conditions will be assessed at least once every five (5) years since sagebrush and its associated vegetation take years to respond to changes in management. The Landowners and the Service may agree to shift this schedule if a wildfire occurs on the enrolled lands (an assessment should be made after the fire), if there is an unusually dry or wet season (an assessment may wait until the next year), or if there has been some type of vegetation treatment implemented. The National Weather Service should be consulted in order to determine if conditions are unusually wet or dry (www.ncdc.noaa.gov/oa/climate/research/us-drought-monthly.html). The monitoring locations and methods can be the same as those used to assess habitat suitability at the time of enrollment (i.e. Stiver *et al.* 2010). Alternatively, the Landowners and the Service, through mutual agreement, can modify the methods or adopt an entirely new method to monitor habitat indicators for sage-grouse if new science becomes available during the life of this CCAA.

   The indicators that will be measured are identified in the tables in **Appendix C**. These tables will be used to summarize the monitoring data and to report on the overall effectiveness of the CMs in ameliorating the threats that are identified in this CCAA. This assessment will be conducted by the Landowners and the Service, or mutually agreed upon third party.

   a. **Locations** - Same as baseline/trend monitoring locations.
   b. **Timing** - Monitoring will be conducted in spring/early summer when forbs and grasses are the easiest to identify.
   c. **Methodology** - Point Intercept Method (at least four 50-meter transects within the two main ecological sites; measurements taken every 1-2 meters; at least 200 points per cover type should be sampled). See Stiver *et al.* 2010; volume III, pages 32-47 for complete instructions on data collection.
      i. Lay out 50-meter tape;
      ii. Take picture with transect identification information and date visible;
      iii. Drop a long (1m), small diameter pin at 1-m intervals along the transect;
      iv. Record any plant or ground cover that touches the pin (start at the top of the pin and work down, record only one hit per life form (shrub, perennial grass, perennial forb, annual grass, annual forb, litter or soil));
      v. Record 'hit' if the pin ends up in a gap less than 5 cm; and
      vi. Record life form heights and sagebrush shape.

4. **Population Trend Assessment** (**BCP**), (**MCP -if lek is discovered**): Lek counts will be the primary basis for monitoring populations. Lek monitoring will follow current monitoring protocols established by the ODFW (Hagen 2011 p. 164-173; provided in **Appendix D**) who typically coordinates the monitoring. Lek monitoring will be

conducted by the Service and the Landowners, or mutually agreed upon third party, in cooperation with the Service and ODFW.

# 13. ADAPTIVE MANAGEMENT

This CCAA is based on adaptive management principles. The Service and the Landowners agree and recognize that implementation of the CMs herein must be consistent with the concepts and principles of adaptive management. Many CMs have been successfully implemented as part of other conservation efforts; however, outcomes of a few CMs may vary based upon local site conditions. Specifically, CMs with a vegetation rehabilitation component may have varying success based upon local soil type and climatic conditions such as rainfall timing and amount. Monitoring, along with the flexibility provided through adaptive management, will maximize the likelihood of success through possible changes to seed mixtures, rescheduling of rehabilitation efforts, timing of treatments, and other adjustments. The effectiveness of the CMs in meeting the CCAA objectives will be monitored and new technologies will be reviewed by the Service and the Landowners. Upon such evaluation, appropriate modifications to the CMs included in this CCAA will be incorporated to further the goals and objectives of this conservation effort.

# 14. REPORTING REQUIREMENTS

The Landowners will provide an annual report to the Service by January 15 of each year. The annual report will summarize compliance and effectiveness monitoring information recorded for the enrolled lands using forms provided in **Appendix A** and **Appendix B** of this CCAA. The annual report will include information such as:

- Degree of compliance with this CCAA;
- Summary of the monitoring results;
- Any population information gathered over the past year (e.g., number, location, sex, age, and date of birds observed) if known;
- Any vegetation information gathered over the past year (e.g., new invasive plant locations, vegetation treatment locations);
- Any recommendations for changes in management and/or monitoring; and
- Any mortality or injury of sage-grouse observed over the previous year.

Any reports of sage-grouse injury or mortality, and the annual form/report required by this Agreement, shall be delivered to:

Field Supervisor, La Grande Field Office
U.S. Fish and Wildlife Service
3502 Highway 30
La Grande, OR 97850
Phone number: (541) 962-8584

# 15. COVERED ACTIVITIES

The term “covered activities” refers to those activities carried out by the Landowners or their authorized representative on enrolled lands that may result in authorized incidental take of sage-grouse consistent with this CCAA. In this case, covered activities include:

- Ongoing and planned practices listed below

- Conservation measures (Section 10) and changed circumstances conservation measures (Section 19)
- Limited use of specific herbicides as described in **Appendix E**
- Inventory and monitoring activities identified in the Section 12 as well as **Appendix C**

### *15.1 Rangeland Treatments*

- Juniper and/or conifer treatments/removal.
- Weed control with herbicides (in accordance with **Appendix E**).
- Seeding or plugs with native grasses, forbs, and sagebrush to enhance both sage-grouse habitat and livestock forage.

### *15.2 Livestock Management*

- Grazing of forage.
- Gathering, moving, trailing, and shipping livestock.
- Construction, placement, and maintenance of fences, ponds, stock-tanks and other watering sources.
- General stewardship and animal husbandry practices.

### *15.3 Other Activities*

- Maintenance of houses, outbuildings, fences and corrals, and road maintenance.
- Use of off-trail vehicles both on and off established roads in order to carry out the other covered activities above.

## 16. ANTICIPATED INCIDENTAL TAKE

This CCAA will result in overall benefits to sage-grouse; however, take may occur as a result of the covered activities. Take that results from, but is not the purpose of, carrying out an otherwise lawful activity such as rangeland management is known as incidental take. Incidental take will likely occur sporadically on enrolled lands and is not expected to nullify the conservation benefits that are described in this CCAA.

### *16.1 Types of Take*

We considered three primary types of incidental take: (1) injury or death; (2) harm in the form of habitat fragmentation, loss, or degradation and (3) harassment in the form of human activities that significantly disrupt normal behavioral patterns such as breeding, feeding, or sheltering. For each type of take we describe the associated covered activities and the conservation measures that will minimize the take.

**Injury or death**

- Fences used for livestock management, especially those in certain high-risk locations can cause direct mortality to sage-grouse from collision (Beck and Mitchell 2000; Connelly *et al.* 2004; Crawford *et al.* 2004; Cagney *et al.* 2010). The risk of collision with fences will be minimized by limiting new fence construction, and marking fences in high-risk locations to make them more visible to sage-grouse (**CM1** and **CM24**).
- Vertical structures such as telephone, power lines and poles, and fence posts serve as raptor perches and therefore can indirectly contribute to injury and death to sage-grouse

from avian predators. This risk will be minimized by using perch deterrents where needed (**CCCM 13**).

- Livestock water tanks can pose a drowning risk to sage-grouse when they use them as a water source. This risk will be minimized by properly equipping stock-tanks with escape ramps (**CM21**).
- Herbicides listed in **Appendix E** are not known to directly injure or kill sage-grouse (USFWS 2010); however, there have been limited studies which are specific to sage-grouse. The risk of mortality associated with herbicide use will be minimized by only using approved herbicides and implementing all best management practices on enrolled lands (**Appendix E**). If it is found that these herbicides do injure or kill sage-grouse their use will be discontinued as a covered activity under the changed circumstances provisions (**CCCM 18**).

**Harm**

- Improperly managed livestock grazing can result in decreased beneficial grasses and forbs in nesting and brood-rearing habitat (Hagen *et al.* 2007; Gregg et al. 1994). There are several CMs that address impacts of livestock grazing and the Landowners will be required to modify grazing practices if the threat of "improperly managed livestock grazing" is occurring on the enrolled lands. This risk will be further minimized with annual monitoring and reporting of utilization on enrolled lands as well as adapting to drought or other environmental factors that may increase or decrease forage (**CM5**, **CM19**, **CM20**, **CM22**, **CM25** to **CM29**, **CCCM 6**, **CCCM 15**, **CCCM 16**, and **CCCM 17**).

**Harassment**

- Due to seasonal accessibility or weather issues, rangeland treatments such as juniper removal from sagebrush habitat may need to be conducted when sage-grouse are utilizing the enrolled lands. If so, this would cause some temporary harassment of sage-grouse. However, without treatment, juniper encroachment can make habitat unsuitable for sage-grouse. Harassment will be minimized through careful scheduling of treatments (**CM 8** and **CM11**).
- Livestock management activities such as moving cattle to different areas may cause sage-grouse to flush or otherwise disrupt their behavior. In the majority of instances this disturbance is expected to be of very short duration such that it will only infrequently rise to the level of take.
- Activity in the vicinity of active leks may cause birds to flush or abandon. This risk will be minimized by limiting unnecessary access during certain times of the year when sage-grouse are using the enrolled lands (i.e. lekking, wintering or brood-rearing) as applicable (**CM16**, **CM17**, **CM18**, and **CM31**).
- Maintenance of existing fences or the construction of new fences for livestock management can cause harassment of sage-grouse. Risk of disturbance from these activities will be minimized by timing them outside of the breeding season (**CM1, CM16**, **CM17**, **CM18**, **CM31**).

## *16.2 Authorized Take*

Authorization of incidental take of sage-grouse, if they become listed, is provided in the EOS permit issued by the FWS in association with this CCAA This authorization is limited to

incidental take resulting from covered activities and is valid as long as the CCAA and the terms and conditions in the EOS Permit are being properly implemented. The amount of authorized incidental take from covered activities would be a maximum of 67 sage-grouse on the Baker County property and a maximum of 19 sage-grouse on the Malheur County property over the 30-year term of this CCAA. However, no more than 2 birds annually on the Baker County property and no more than 2 birds every three years on the Malheur County property may be taken. Additionally, the evaluation of take will be based on a rolling 3-year average such that if take is high in one year it will not exceed authorized take unless the 3-year average annual take exceeds authorized take. Table 3 shows how we estimated incidental take.

**Table 3. Estimated Take Calculation for Baker and Malheur County properties.**

| Treatment Type* | Acres Impacted | Birds Exposed | Rate of Injury or Mortality | Annual Take |
|---|---|---|---|---|
| **Rangeland Treatments** | | | | |
| Baker - no more than 625 acres per year (continuing until conservation objectives are met – approx. 12 years) | 625 | 7 | 3.59% | 0.26 |
| Malheur - no more than 2,260 acres treated in 3-year period (continuing until conservation objectives are met – approx. 12 years) | 753 | 3 | 3.59% | 0.09 |
| **Livestock Management** | | | | |
| Baker (60% birds exposed) | 3,662 | 26 | 3.59% | 0.93 |
| Baker (60% birds exposed) | 3,662 | 26 | 1.11% | 0.29 |
| Malheur (60% birds exposed) | 3,628 | 7 | 3.59% | 0.26 |
| Malheur (60% birds exposed) | 3,628 | 7 | 1.11% | 0.08 |
| **Other Activities** | | | | |
| Baker - fences (high risk marked) | 3,662 | 43 | 1.62% | 0.70 |
| Baker - additional authorized take (i.e. vehicle collision, drowning) | 3,662 | 43 | 0.50% | 0.22 |
| Malheur - fences (high risk marked) | 3,628 | 12 | 1.62% | 0.20 |
| Malheur - additional authorized take (i.e. vehicle collision, drowning) | 3,628 | 12 | 0.50% | 0.06 |
| | | | | |
| **Total authorized Annual Take** | | | | ***3.08*** |
| **Total Take over 30 years** (includes 12 years of Rangeland Treatments) | | | | ***86.02*** |
| **Annual Take Percentage** | | | | ***5.58%*** |

*For details on how the numbers above were calculated see **Appendix F**.

## *16.3 Impacts of the Taking*

Authorizing a total annual take of 5.6% of the estimated sage-grouse population on the Baker and Malheur County properties will not adversely affect populations (Sedinger *et al.* 2010;

Connelly 2000; ODFW 2010). The authorized take associated with this CCAA (5.6%), combined with ODFW's actual (3%) or allowed (5%) harvest rates (ODFW 2011) could account for an average 8.6-10.6% annual loss of the sage-grouse population in areas that are under this CCAA and where hunting of sage-grouse occurs. Cumulative impacts of harvest on sage-grouse populations in Oregon are evaluated annually by ODFW. An 8.6-10.6% loss follows the range-wide sage-grouse management guidelines that recommend a harvest rate of 10% or less for healthy sage-grouse populations (Connelly et al. 2000), and below recently published peer-reviewed science for Colorado and Nevada, which found "at harvest rates <11% harvest is unlikely to have an important influence on local population dynamics of sage-grouse" (Sedinger *et al.* 2010). Additionally, the authorized amount of take may be adjusted if the statewide 10-year minimum spring breeding population average changes by more than 10%.

### *16.4 Monitoring and Evaluation of Take*

Monitoring of take will be addressed through monitoring of the extent of occupied habitat and habitat condition. The Landowners will report mortality from incidental take to the Service (as required in the **Responsibilities of the Parties** section). Evaluation of take will be based on a rolling 3-year average such that if take is high in one year it will not exceed authorized take unless the 3-year average exceeds the amount of take permitted.

## 17. EXPECTED BENEFITS

As identified in the Service's Candidate Conservation Agreement with Assurances Final Policy (USFWS 1999) and regulations at 50 CFR 17.22, to enter into a CCAA and issue a permit and assurances, the Service must determine that the CMs and expected conservation benefits from this CCAA, combined with those benefits achieved if similar CMs were also implemented on other similar properties throughout the range of the sage-grouse, would remove the need to list the species. The expected conservation benefits in relation to threats known or potentially occurring on the enrolled lands are described in the following paragraphs.

The CMs identified in this CCAA are expected to benefit sage-grouse through maintenance, enhancement, and restoration of sage-grouse populations and their habitats and by reducing threats causing direct and indirect mortality. The Landowners control 7,391 acres of important habitat for sage-grouse; therefore, implementation of the CMs on the enrolled lands will improve conservation of this species on a relatively large scale. This CCAA is an opportunity to maintain or improve the existing condition of approximately 7,391 acres of privately-owned and leased sage-grouse habitat, with the expected result of larger and more widely distributed populations of sage-grouse throughout Baker and northern Malheur Counties. The Service believes if similar conservation measures that address all threats to sage-grouse were implemented throughout sage-grouse range; the need to list sage-grouse would likely be precluded.

Some specific benefits to sage-grouse provided by rangeland management activities implemented in accordance with this CCAA are:

- Maintenance of large tracts of unfragmented and undeveloped land;
- Management of fuels to help reduce the risk of catastrophic wildfires;
- Management of weed and invasive species; and

- Maintenance of healthy, intact sage-grouse breeding, brood-rearing and wintering habitats (Beck and Mitchell 2000; Connelly *et al*. 2004; Crawford *et al.* 2004; Cagney *et al.* 2010).

# 18. ASSURANCES PROVIDED

Through this CCAA, the Service provides the Landowners with assurances that no additional CMs or additional land, water, or resource use restrictions, beyond those voluntarily agreed to and described in the **Conservation Measures** and **Changed Circumstances** sections of this CCAA will be required should the Greater sage-grouse become listed as a threatened or endangered species in the future. These assurances will be authorized with the issuance of an EOS permit under Section l0(a)(l)(A) of the ESA. These assurances apply only if the CCAA is being properly implemented.

# 19. CHANGED CIRCUMSTANCES

Changed circumstances are changes affecting a species or geographic area covered by this CCAA that can reasonably be anticipated and can be planned for. The signatories to this CCAA agree to work together in good faith to address the changed circumstance to the best of their abilities. This CCAA has identified the following as potential changed circumstances that can be expected to occur over the 30-year life of the permit including wildfire, drought, West Nile virus, and habitat fragmentation from development. Additional CMs described below have been developed to respond when these changed circumstances occur and are labeled as Changed Circumstance Conservation Measure (CCCM).

## *19.1 Wildfire*

Wildfire impacts affecting the enrolled lands will be handled on a case-by-case basis. The Service will meet with the Landowners to determine the management practices to be applied, which may include:

- **CCCM 1**. The Service and the Landowners will evaluate the need for rehabilitation based on pre-fire plant community health, fire intensity, and proximity to invasive annual species (e.g., cheatgrass, medusahead). The Service will provide a written summary to the Landowners of their evaluation and need for active rehabilitation or for natural recovery.
- **CCCM 2.** The Landowners will allow for natural vegetation recovery where healthy pre-fire plant communities exist and observed fire intensity indicates natural recovery and proximity of invasive species are not a concern. Timing of livestock grazing following wildfire will depend on response of desirable vegetation. The Service and the Landowners will identify and set quantifiable objectives for post-fire vegetation recovery based on pre-fire monitoring data, returning livestock grazing once objectives have been met.
- **CCCM 3.** Following wildfire, the Landowners will participate in rehabilitation where natural recovery is unlikely, due to fire intensity and/or proximity to invasive annual species, and where feasible, practicable, and if adequate funding is available. Where annual grasses are prevalent, plant fire-resistant perennial species (including sagebrush, grasses and forbs) to stabilize the site, and allow for long term recovery of sagebrush and

other native species. The Landowners will use certified weed-free seed mixes and mulches, when available.

- **CCCM 4.** The Service will conduct post-treatment monitoring to determine if rehabilitation techniques have been successful or if implementation changes are indicated (see Section **12. Inventory and Monitoring**).
- **CCCM 5.** The Landowners will replace fence or temporarily fence where needed to protect recovering habitat post-fire, and, where appropriate, mark these fences with anti-strike markers or other agreed upon visual markers, as described in the **Conservation Measures** section above (see Section 10).

## *19.2 Drought*

When rangeland plants are deprived of precipitation, it affects the plant's growth cycle, volume of growth, and fruition. When drought conditions exist, annual monitoring will be used to determine site-specific recommendations. Drought is site-specific and is typically considered to occur when two growing seasons of precipitation are below the long term average, affecting plant life cycles as described above. Prolonged drought is when the conditions described above persist for three or more growing seasons.

Variation in precipitation is common throughout the sage-grouse range. Annual rangeland monitoring and CMs on enrolled lands are expected to address year to year variations in precipitation. Droughts in important sage-grouse habitats may create conditions reducing seasonally available habitat resulting in changed circumstances. In some instances, failure to make timely adjustments in livestock use during drought has resulted in limited plant regrowth, overuse in wet meadows and riparian areas, and has negated gains in rangeland conditions made during higher-precipitation years (Thurow and Taylor 1999).
In the event of moderate to extreme drought, as determined by National Oceanic and Atmospheric Administration, the Service will meet with the Landowners to evaluate the drought condition effect on sage-grouse habitat. The following CCCM is intended to address the changed circumstance:

- **CCCM 6.** The Service and the Landowners will evaluate the need to adjust levels and season of livestock grazing during drought conditions to maintain suitable sage-grouse habitat using the site-specific conditions as determined in the baseline and subsequent trend monitoring. These adaptive management measures may include:
    a. Implement management changes, such as grazing rest, deferment, rotation, or other changes designed to maintain long term vegetation health for sage-grouse habitat;
    b. Develop grass banks for use during drought conditions; and
    c. Develop additional water sources for livestock and sage-grouse.

## *19.3 Disease (West Nile Virus)*

WNv has spread to eastern Oregon. In 2006, a die-off of at least 60 sage-grouse was documented near Burns Junction, and two other sage-grouse deaths were confirmed from WNv near Crane and Jordan Valley. Of the birds found dead, three provided suitable tissue samples and all were confirmed to be infected with WNv. No other significant mortalities have been documented in Oregon since 2006. However, there is the potential for an outbreak among sage-grouse, which are susceptible to the disease and suffer a high rate of mortality when infected. Currently, sage-

grouse show low-no resistance to WNv, and mortality is assumed to be 100-percent (Naugle *et al.* 2004).

In the event of a disease outbreak, the Landowners should implement the following CCCMs, as appropriate:

- **CCCM 7.** Report observations of dead or sick sage-grouse, or other bird deaths, that could be attributed to disease or parasites to the Service within 48 hours.
- **CCCM 8.** Cooperate with responsible agencies to implement feasible mosquito control, which may include:
    a. Minimize unnecessary standing water that could be used as mosquito breeding grounds within sage-grouse habitat;
    b. Use larvicides in areas that mosquito habitat cannot be reduced; and
    c. Evaluate the effectiveness of spraying for adult mosquitoes, and consider using mosquito specific control measures.

## *19.4 Habitat Fragmentation (Development)*

Impacts can include both direct loss of habitat and habitat fragmentation by roads, pipelines, power lines, wind turbines, and other infrastructure. Accompanying noise disturbance can also reduce lek attendance and reproductive success.

In the event of energy development on, or adjacent to, lands enrolled under this CCAA, in which the Landowners do not have the legal ability (e.g., split estate mineral rights, noise disturbance from adjacent development) to exclude such development, the following measures may apply:

- **CCCM 9.** The Service and the Landowners will evaluate the direct and indirect impacts to determine if the impacts will negate the intended benefits of the CMs being implemented or planned to be implemented on the enrolled lands.
- **CCCM 10.** If these impacts are found to negate the CMs on some portion of the enrolled lands the Landowners and the Service will meet and develop alternative, mutually-agreed-upon CMs including, but not limited to, alternate CM implementation location within the enrolled lands.

In the event that planned development, on lands that the Landowners chose not to enroll in the CCAA but *do* have legal control of, is likely to affect sage-grouse and their habitats on the Landowner's enrolled lands, the following CCCMs may apply:

- **CCCM 11.** The Landowners and the Service will evaluate the direct and indirect impacts to determine if the impacts are likely to negate the intended benefits of the CMs being implemented or planned to be implemented on the enrolled lands.
- **CCCM 12.** If these impacts are found to negate the CMs to the extent that the CCAA standard is no longer being met, the Landowners will work with the Service and develop an alternate approach for the planned development or for the enrolled lands to maintain the CCAA standard and Landowners enrollment. If an agreement cannot be reached and the CCAA standard is no longer being met, the Landowners or the Service can terminate the CCAA and associated assurances.

## *19.5 Predation*

Some rangeland management operations can increase opportunities for predation of sage-grouse and sage-grouse nests. In addition, in some isolated, translocated, or declining sage-grouse

populations, predation can be a limiting factor. In the event that ODFW, the Service and the Landowners agree that predation is a limiting factor, to reduce mortality to sage-grouse individuals and/or sage-grouse broods, the following CCCMs may apply:

- **CCCM 13.** Use perch deterrents on fence posts or other human-made structures that are used by corvids or raptors for perching and/or nesting, to the extent funding is available.
- **CCCM 14**. Support predator management programs that include both lethal and non-lethal methods. Predator management activities will be coordinated with ODFW and the Service.

### *19.6 Invasive and/or Noxious Weeds*

Establishment of plant communities that do not provide suitable habitat (e.g., introductions and monocultures of non-native, invasive plants) reduce sage-grouse habitat quality and quantity. Prevention and early detection of infestations is needed since invasive weeds continue to expand from borders of large infestations. In the event invasive and/or noxious weed infestations are discovered on the enrolled lands, the following measures may apply:

- **CCCM 15**. Develop and conduct systematic and strategic detection surveys in a manner maximizing the likelihood of finding new patches before they expand. Once patches are located, seed production should be stopped and the weeds should be eradicated. The most effective tools for eradication of many weeds are herbicides.
- **CCCM 16**. Apply herbicides using all of the best management practices and only approved herbicides listed in **Appendix E** on the enrolled lands for coverage under the 10(a)(1)(A) permit associated with this agreement.
- **CCCM 17**. Treat invasive and/or noxious weeds with herbicides on no more than 150 acres per property in any given year (this acreage is approximately five percent of each property). If larger infestations are located, the Landowners and the Service will meet and develop alternative, mutually-agreed-upon treatment acres.

Currently, research is lacking on the direct effects of herbicides to sage-grouse; however, research on sage-grouse is ongoing and new studies are being published. The herbicides covered under this agreement (see **Appendix E**) are not currently known to negatively affect sage-grouse. Indirect effects from herbicides can impact occupied habitats and reduce available insects for forage as well as reduce cover of desirable plants, however, the intent of the CCAA is to use herbicides to improve sage-grouse habitat over the long term and best management practices described in **Appendix E** are intended to minimize negative impacts to occupied habitat. If new research indicates that one or more covered herbicides are found to cause significant adverse effect to sage-grouse the following CCCM has been developed.

- **CCCM 18.** The Service can remove herbicides (or group of herbicides) from the covered list; or if feasible, require implementation of additional best management practices with the Landowners to avoid and minimize take.

## 20. UNFORESEEN CIRCUMSTANCES

Unforeseen circumstances are those circumstances affecting sage-grouse that could not reasonably have been anticipated by the Landowners or the Service at the time of the CCAA's development, and result in a substantial and adverse change in the status of the sage-grouse. To respond to unforeseen circumstances, the Service may require modified or additional measures of the Landowners, but only if such measures maintain the original terms of the

CCAA. The Service will consider whether failure to adopt additional CMs would appreciably reduce the likelihood of survival and recovery of sage-grouse in the wild. Additional CMs will not involve the commitment of additional land, water, or landowner funds, or additional restrictions on the use of land, water, or other natural resources available for development or use under the original terms of the CCAA without the consent of the Landowners. Funding for CMs warranted under this section will be sought by the Service and/or other partners including the Landowners if he or she desires.

The Service will have the burden of demonstrating that unforeseen circumstances exist, using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the Greater sage-grouse. The Service will consider, but is not be limited to, the following factors when determining if/when unforeseen circumstances exist:

- Size of the current range of sage-grouse;
- Percentage of range adversely affected by the CCAA;
- Percentage of range conserved by the CCAA;
- Ecological significance of that portion of the range affected by the CCAA;
- Level of knowledge about sage-grouse and the degree of specificity of the species' conservation program under the CCAA; and
- Whether failure to adopt additional CMs would appreciably reduce the likelihood of survival and recovery of sage-grouse in the wild.

# 21. DURATION OF CCAA AND PERMIT

This CCAA will be in effect for 30 years following its approval and signing by the Service. The Section 10(a)(1)(A) EOS permit authorizing take of the species also will have a term of 30 years from the effective date of the permit. This duration should be sufficient to determine that the CMs are benefiting the sage-grouse. This CCAA will remain in effect until the Landowners or the Service terminates it.

# 22. MODIFICATION OF CCAA

The Landowners or the Service may propose modifications or amendments to the CCAA, as provided in 50 CFR 13.23, by providing written notice to, and obtaining the written concurrence of, the other signatory. Such notice will be in the form of an amendment and may be considered at any time after a 30-day notice to the other signatory. No amendment shall be valid unless executed by both signatories to this agreement. Signatories will meet at least annually to review the CCAA and its effectiveness to determine whether revision is necessary. This review will take place prior to the next grazing season to give the Landowners time to make adjustments in management. However, depending on the timing of the review and the nature of any agreed upon adjustments, adjustments in management might take another year before full implementation. The Service may not, through modification of the CCAA, impose any new requirements or conditions on, or modify any existing requirements or conditions applicable to, the Landowners or successor in interest to the Landowners to compensate for changes in the conditions or circumstances of any species or ecosystem, natural community, or habitat covered by the CCAA except as stipulated in 50 CFR 17.22(d)(5) and 17.32(d)(5).

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# 23. TERMINATION OF CCAA

As provided for in the draft CCAA Handbook (USFWS 2003), the Landowners may terminate implementation of the voluntary management actions prior to the CCAAs expiration date, even if the expected benefits have not been realized. If the Landowners are unable or unwilling to continue implementation of the plan and stipulations of the CCAA, the Landowners must relinquish the permit to the Service. In addition, either signatory may withdraw from this agreement at any time by providing 30 days written notice to the other signatory.

# 24. PERMIT SUSPENSION OR REVOCATION

The Service may suspend the privileges of exercising some or all of the EOS permit authority at any time if the Landowners do not comply with the conditions of the permit, or with any applicable laws or regulations governing the conduct of the permitted activity. Such suspension shall remain in effect until the issuing officer determines that the Landowners have corrected the deficiencies.

The Service may not revoke an EOS permit except for reasons set forth in 50 CFR 13.28(a)(1) through (4). This regulation authorizes revocation if:

- The Landowners willfully violates any Federal or State statute or regulation, or any Indian tribal law or regulation, or any law or regulation of any foreign country, which involves a violation of the conditions of the permit or of the laws or regulations governing the permitted activity; or
- The Landowners fail within 60 days to correct deficiencies that were the cause of a permit suspension; or
- The Landowners become disqualified; or
- A change occurs in the statute or regulation authorizing the permit that prohibits the continuation of a permit issued by the Service.

A permit can be disqualified or revoked if:

- Conviction, or entry of a plea of guilty or nolo contendere, for a felony violation of the Lacey Act, the Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act disqualifies any such person from receiving or exercising the privileges of a permit, unless such disqualification has been expressly waived by the Director in response to a written petition;
- Revocation of a permit for reasons found in § 13.28 (a)(1) or (a)(2) disqualifies any such person from receiving or exercising the privileges of a similar permit for a period of five years from the date of the final agency decision on such revocation;
- Failure to pay any required fees or assessed costs and penalties, whether or not reduced to judgment disqualifies such person from receiving or exercising the privileges of a permit as long as such moneys are owed to the United States. This requirement shall not apply to any civil penalty presently subject to administrative or judicial appeal; provided that the pendency of a collection action brought by the United States or its assignees shall not constitute an appeal within the meaning of this subsection; or
- Failure to submit timely, accurate, or valid reports as required may disqualify such person from receiving or exercising the privileges of a permit as long as the deficiency exists.

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The Service may revoke an EOS permit if continuation of the permitted activity would either: (a) appreciably reduce the likelihood of survival and recovery in the wild of any listed species, or (b) directly or indirectly alter designated critical habitat such that it appreciably diminishes the value of that critical habitat for both the survival and recovery of a listed species.

Before revoking a permit for either of the last two reasons, the Service, with the consent of the Landowners, will pursue all appropriate options to avoid permit revocation. These options may include, but are not limited to: extending or modifying the existing permit, capturing and relocating the species, compensating the Landowners to forgo the activity, purchasing an easement or fee simple interest in the enrolled property, or arranging for a third party acquisition of an interest in the property.

# 25. SUCCESSION AND TRANSFER

This CCAA shall be binding on and shall inure to the benefit of the enrolled Landowners and their respective successors and transferees (i.e. new owners) in accordance with applicable regulations (50 CFR 13.24 and 13.25). The new owner(s) will have the option of receiving CCAA assurances and transfer of the permit by signing the original CCAA. The EOS permit and assurances issued to the enrolled Landowners will be extended to the new owner(s) only if they choose to enroll. As a party to the original CCAA and permit, the new owner(s) will have the same rights and obligations with respect to the enrolled property as the original owner. Alternatively, the new owner(s) may enroll in a new CCAA and receive a new permit and assurances.

The enrolled Landowners shall notify the Service of any transfer of ownership, so that the Service can attempt to contact the new owner, explain the baseline responsibilities applicable to the property, and allow the new owner the opportunity in signing the existing CCAA or a new one to benefit sage-grouse on the property. Assignment or transfer of the permit shall be governed by Service regulations in force at the time. If a new owner chooses not to enroll, the permit authorizations and assurances will cease.

# 26. REMEDIES

Each party shall have all remedies otherwise available to enforce the terms of the CCAA and the EOS permit, except that no party shall be liable in monetary damages for any breach of this CCAA, any failure to perform an obligation under this CCAA, or any other cause of action arising from this CCAA.

# 27. DISPUTE RESOLUTION

The Service and the Landowners recognize disputes concerning implementation of, compliance with, or termination of this CCAA or EOS permit may arise from time to time. Both the Service and the Landowners agree to work together in good faith to resolve such disputes, using the informal dispute resolution procedures set forth in this section, or such other procedures upon which the Service and the Landowners may later agree. However, if at any time any party determines circumstances so warrant, it may seek any available remedy without waiting to complete informal dispute resolution.

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Unless the parties agree upon another dispute resolution process, or unless an aggrieved party has initiated administrative proceedings or suit in Federal court as provided in this section, the parties may use the following process to attempt to resolve disputes:

- The aggrieved party will notify the other party of the provision potentially violated, the basis for contending a violation has occurred, and the remedies it proposes to correct the alleged violation.
- The party alleged in violation will have 30 days, or such other time as may be agreed, to respond. During this time, it may seek clarification of the information provided in the initial notice. The aggrieved party will use its best efforts to provide any available information responsive to such inquiries.
- Within 30 days after such response was provided or was due, representatives of the parties having authority to resolve the dispute will meet and negotiate in good faith toward a solution satisfactory to all parties, or will establish a specific process and timetable to seek such a solution.
- If any issues cannot be resolved through such negotiations, the parties will consider non-binding mediation and other alternative dispute resolution processes and, if a dispute resolution process is agreed upon, will make good faith efforts to resolve all remaining issues through that process.

# 28. AVAILABILITY OF FUNDS

Implementation of this CCAA is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this CCAA will be construed by the Parties to require the obligation, appropriation, or expenditure of any funds from the U.S. Treasury. The Parties acknowledge that the Service will not be required under this CCAA to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

# 29. RELATIONSHIP TO OTHER AGREEMENTS

The Oregon Cattleman's Association, the BLM, and the Service developed a Candidate Conservation Agreement (CCA) on the public lands that BLM manages. In addition, the Harney County Soil and Watershed Conservation District is working with the Service to develop a programmatic CCAA for private lands in Harney County, Oregon. Both the Harney County programmatic CCAA and the CCA will utilize similar CMs as the CMs included in this CCAA. These efforts will enhance the comprehensive landscape approach to Greater sage-grouse conservation for livestock management and associated activities in Oregon.

# 30. NO THIRD-PARTY BENEFICIARIES

This CCAA does not create any new right or interest in any member of the public as a third-party beneficiary, nor does it authorize anyone not a party to this CCAA to maintain a suit for personal injuries or damages pursuant to the provisions of this CCAA. The duties, obligations, and responsibilities of the Parties to this CCAA with respect to third parties will remain as imposed under existing law.

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## 31. SIGNATURES

IN WITNESS WHEREOF, THE PARTIES HERETO, agree to execute this CCAA, effective as of the date of the last signature, and hereby commit to carry out the responsibilities identified in the **Responsibilities of the Parties** section of this agreement.

_____ _____

William Moore Date
Landowner

_____ _____

Nancy Moore Date
Landowner

_____ _____

Paul Henson, Ph.D. Date
State Supervisor
U.S. Fish and Wildlife Service

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# APPENDIX A: Annual Reporting Form

Landowner Name: _____

Property Name: _____

Phone Number: _____

Email: _____

Agreement Tracking Number: _____

**NOXIOUS WEED OBSERVATIONS/MONITORING:** Please record the locations of new weed occurrences here. Provide map, landmarks, and/or GPS coordinates.

| | Date | Location (UTMs or landmarks) | Species Observed | New Site? (Y/N) | Status (I, D, S, U*) |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |

*Documentation of known sites is not required, but the Landowner may wish to document significant changes that are occurring to some infestations. I = Increasing, D = Decreasing, S = Stable, U = Unknown)

**PHOTO POINT MONITORING**: Please attach photographs to this form.

| Station | Date | Photographer | Observations |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

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## IMPLEMENTATION OF CONSERVATION MEASURES:

A. Please answer all of the questions that relate to the conservation measures in **Appendix B**.

B. Please describe extra conservation measures you implemented this past year here.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

## SAGE-GROUSE OBSERVATIONS:

***Live Sage-Grouse Observed:*** This is intended for any sage-grouse you happen to observe, regardless of the season (e.g., winter, brood-rearing, lekking). Please include lek information. This information is one tool that will help document the response of sage-grouse to implementation of the CMs.

| | Date | Time | Location (UTM/landmark) | Number Observed (Specify Sex if Known) | | | Comments |
|---|---|---|---|---|---|---|---|
| | | | | Male | Female | Unknown | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |

***Sage-Grouse Mortalities or Injuries:*** Please record sage-grouse mortalities or injuries that do not appear to be caused by predation.

| | Date | Time | Location (UTM/landmark) | Number Observed (Specify Sex if Known) | | | Comments |
|---|---|---|---|---|---|---|---|
| | | | | Male | Female | Unknown | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |

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# APPENDIX B: List of Compliance Monitoring Questions

Landowner Name: _____ Enrolled Property Name: _____ Year: _____

| HABITAT FRAGMENTATION<br>Conservation Measures | | BCP | | | MCP | | |
|---|---|---|---|---|---|---|---|
| | | Yes | No | N/A | Yes | No | N/A |
| CM1 | Did you maintain contiguous habitat by avoiding further fragmentation (e.g., avoid subdividing enrolled lands, avoid habitat conversions including the planting of non-native pasture grasses, and avoid sagebrush removal). | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | If not, did you coordinate with the Service on the potential for fragmentation? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

☐ Describe any disturbances that occurred on the enrolled lands this past year (Jan 1-Dec 31), including location, acres of sage-grouse habitat impacted, and the post-disturbance habitat condition.

☐ Describe any disturbances that occurred adjacent to the enrolled lands this past year (Jan 1-Dec 31), including location, acres of sage-grouse habitat impacted, and the post-disturbance habitat condition.

☐ For CMs that were not implemented, please describe why this CM was not implemented

| WILDFIRE<br>Conservation Measures | | BCP | | | MCP | | |
|---|---|---|---|---|---|---|---|
| | | Yes | No | N/A | Yes | No | N/A |
| CM2 | Did you support or participate in the Ironside Rural Fire Protection District with initial attack to protect existing or potential sage-grouse habitat? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| CM3 | Did you provide equipment and personnel for initial attack to protect existing or potential sage-grouse habitat, where possible? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| CM4 | Did you encourage direct tactics be used to fight fire in sage-grouse habitat? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| CM5 | Did you utilize livestock grazing to reduce fuel loads while maintaining 5-15% native grass canopy cover? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

☐ Describe the fires that occurred on the enrolled lands this past year (Jan 1-Dec 31), including location, acres of sage-grouse habitat burned, and the post-fire range condition.

☐ Describe fire suppression efforts for the enrolled lands, *if these efforts differed* from your fire suppression plan.

☐ Describe specific fire prevention efforts conducted on the enrolled lands in the past year (i.e. green-stripping).

☐ Describe post-fire rehabilitation efforts and post-treatment monitoring that occurred this past year. Include a description of seed mixes used. If non-natives were included in seed mixes, describe your plan, timeframe, and post-treatment monitoring you will use to establish appropriate native species. *Attach pre- and post-treatment photos. You can attach and cross-reference a report if one is available.*

☐ For CMs that were not implemented, please describe why this CM was not implemented

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| **JUNIPER EXPANSION**<br>**Conservation Measures** | | **BCP** | | | **MCP** | | |
|---|---|---|---|---|---|---|---|
| | | **Yes** | **No** | **N/A** | **Yes** | **No** | **N/A** |
| **CM6** | Did you work with agency specialists to determine whether there is a need for juniper treatment and, if needed, the appropriate method? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | If areas need to be treated, do you have a plan for treatment? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM7** | Did you treat/remove juniper/conifer in sage-grouse habitats? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you give Phase I and II treatments a higher priority for removal than Phase III? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM8** | Did you ensure timing of juniper/conifer treatment/removal did not interfere with lekking or other known seasonal movements of sage-grouse or other critical sage-grouse habitat features (e.g., wintering habitat) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM9** | For Phase I juniper treatments, did you use the "felling and leaving" method? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | If so, did you limb any branches >1.5 m (4 ft) in height on felled trees? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM10** | Did you treat/remove juniper/conifer in riparian and transitional zones? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM11** | Did you work with agency specialists to determine an appropriate time of year to conduct the juniper treatments? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Were you able to implement this timing as agreed? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM12** | Did you conduct a spring burn? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you ensure the burn did not disrupt lekking or other known seasonal movements of sage-grouse? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM13** | Did you conduct a broadcast burn? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you only burn 1/3 of the treatment area? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM14** | Did seed any juniper treatments? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you use a certified weed-free seed mix? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM15** | Did you remove juniper from mountain big sagebrush through cutting and jack-pot burning? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

☐ Describe any juniper treatments conducted this past year. Include the following information: location, acres treated, methods used, results, and post-treatment monitoring. *Attach pre- and post-treatment photos. You can attach and cross-reference a report if one is available.*

☐ Please describe any other juniper treatments that were conducted under this Agreement in previous years that required follow-up treatment or multiple years of monitoring.

☐ For CMs where you answered "no," please describe why this CM was not implemented.

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| **LIVESTOCK MANAGEMENT**<br>**Conservation Measures** | | **BCP** | | | **MCP** | | |
|---|---|---|---|---|---|---|---|
| | | **Yes** | **No** | **N/A** | **Yes** | **No** | **N/A** |
| **CM16** | Did you avoid off-trail vehicular travel in from March 1 through June 30 unless travel is essential for routine ranch activities (e.g., repairing fence, "doctoring" livestock, finding lost livestock, and irrigation activities)? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM17** | Did you avoid activity one hour before sunset to two hours after sunrise from March 1 to May 1 within 0.6 mile of the perimeter of occupied leks (except brief occupancy that was essential for routine ranch activities)? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM18** | Did you avoid concentrating livestock on or near leks from March 1 through May 1? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM19** | Did you adjust livestock use (season of use, timing, intensity, and/or duration) to reduce the impact on perennial herbaceous cover, plant diversity, and plant vigor that enables enrolled lands to meet the seasonal habitat needs for sage-grouse identified for the site? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | What changes did you make from the previous year's management? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM20** | Did you move salting locations from the previous year? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | If not, why? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM21** | Do existing water troughs have escape ramps? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you install escape ramps in new and existing water troughs? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM22** | Did you manage grazing in riparian areas or wet meadows to ensure channel stability, to allow adequate riparian wetland vegetative cover to protect stream bank, and to prevent excessive use of woody species? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM23** | Were new spring developments constructed to maintain their free-flowing natural and wet meadow characteristics? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Were existing spring developments modified to maintain their free-flowing natural and wet meadow characteristics? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM24** | Did you mark fences within 1.6 km (1 mile) of an active lek or known seasonal use area with anti-strike markers? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you remove unused and unnecessary fences? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

☐ Provide a copy of the grazing management plans that are relevant to this property (i.e. grazing leases, other site plans) to the Service, if not previously provided.

☐ Summarize the grazing management in sage-grouse habitat on this property for the past year (Jan 1-Dec 31) *if it differed from your grazing management plan*. Include the dates pastures were grazed if these vary by year due to adaptive management.

☐ For CMs where you answered "no," please describe why this CM was not implemented.

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| **INVASIVE VEGETATION**<br>**Conservation Measures** | | **BCP** | | | **MCP** | | |
|---|---|---|---|---|---|---|---|
| | | **Yes** | **No** | **N/A** | **Yes** | **No** | **N/A** |
| **CM25** | Did you work with County weed experts to ensure correct identification of invasive weeds? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you work with County weed experts to determine where invasive plants occur? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you report new detections to the Service? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM26** | Did you work with Weed Boards, Weed Districts, Oregon State Extension agricultural extension, and/or other local experts as necessary to establish weed prevention areas? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Did you work with Weed Boards, Weed Districts, Oregon State Extension agricultural extension, and/or other local experts as necessary to implement treatments? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM27** | Did you aggressively treat noxious weeds and other invasive plants where they threaten quality of sage-grouse habitat? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM28** | Did you treat Scotch thistle patches in livestock concentration areas? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM29** | Did you have any new annual grass or noxious weed (e.g., cheatgrass, medusahead) infestations (CM applies to monocultures of 1 acre or larger)? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | If so, did you report these infestations to the Service? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

☐ Describe rehabilitation efforts and post-treatment monitoring that occurred this past year. Include a description of seed mixes used. If non-natives were included in seed mixes, describe your plan, timeframe, and post-treatment monitoring you will use to establish appropriate native species. *Attach pre- and post-treatment photos. You can attach and cross-reference a report if one is available.*

☐ For CMs where you answered "no," please describe why this CM was not implemented.

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| **RECREATION**<br>**Conservation Measures** | | **BCP** | | | **MCP** | | |
|---|---|---|---|---|---|---|---|
| | | **Yes** | **No** | **N/A** | **Yes** | **No** | **N/A** |
| **CM30** | Did you post private property and no trespassing signs to discourage public off-road travel near known lek sites? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM31** | Did you avoid disruptive activities one hour before sunset to two hours after sunrise from March 1 to May 1 within 0.6 mile of the two known leks (unless brief occupancy is essential for routine ranch activities)? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM32** | Did you work with Malheur County, adjacent landowners, and the Service in pursuing seasonal (or permanent) closures for public access on the main road that bisects the property? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | If so, what was the outcome? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM33** | Did you work with Malheur County, Oregon State Police, ODFW, adjacent landowners, and the Service to increase law enforcement patrol on the enrolled lands? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | If so, what was the outcome? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **CM34** | Did you follow ODFW's lek counting procedures when monitoring the two known lek sites? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

☐ For CMs where you answered "no," please describe why this CM was not implemented.

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# APPENDIX C: Monitoring Forms

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# Sage-Grouse Habitat Suitability Worksheet – Lek Habitat

**(Source: Stiver *et al.* 2010, page III-10)**

| | | | |
|---|---|---|---|
| Date: | State: | County | |
| Evaluators: | | Subpopulation: | |
| Legal Description: T. R. Sections ¼ ¼ | | Home Range Name: | |
| Lek ID#: | | Lek Status (circle one): Active Inactive Unknown | |
| Land Cover Type: | | GPS file #: | UTM: |

**Habitat Suitability Range**

| Habitat Indicator | Suitable | ✔ | Marginal | ✔ | Unsuitable | ✔ |
|---|---|---|---|---|---|---|
| Availability of Sagebrush Cover | *Lek has adjacent protective sagebrush cover (within 100 m)* | | *Sagebrush within 100 m provides very little protective cover* | | *Adjacent sagebrush cover is > 100 m* | |
| Proximity of Trees or Other Tall Structures | *Trees or other tall structures are not within line of sight of lek and none to uncommon within 3 km of lek* | | *Trees or other tall structures are within line of sight of lek and uncommon or scattered within 3 km of lek* | | *Trees or other tall structures are within the vicinity of the lek site* | |

**Site-Scale Suitability**

| |
|---|
| Anthropogenic Noise Description: |
| Rationale for Overall Suitability Rating: |

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# Sage-Grouse Habitat Suitability Worksheet – Lek Habitat Directions

1. Complete one form for each active or inactive lek in the home range or lek group, as needed.

2. Complete all location information at the top of the sheet. Most of the information should be self-explanatory except for the following:

**Subpopulation:** Identify the subpopulation with which the habitat is associated. This definition also includes small populations.

**Home Range Name:** Identify the home range area using a major drainage area or other distinguishing land feature (e.g., Little Lost River Home Range).

**Lek ID #:** Use the identification number or name that is used in the state-wide database.

**Active lek:** *[Greater sage-grouse]* A lek that has been attended by ≥ 2 males in ≥ 2 the previous 5 years; *[Gunnison sage-grouse]* A lek that has been attended by males in the previous 5 years.

**Inactive lek:** *[Greater sage-grouse]* A lek that has been attended by < 2 males in <2 of the previous 5 years; *[Gunnison sage-grouse]* A lek that has been inactive for 5 years.

**Land Cover Type:** Identify the plant community at the lek site. Use plant alliances or associations (Reid *et al*. 2002) for sagebrush or grassland communities; www.natureserve.org/explorer (International Classification of Ecological Communities) or other sampling strata used to describe the habitat (e.g., % sagebrush categories). Use the species Symbol (Table III - 2) for dominant species in the overstory and understory (Examples: ARTRw (alliance level – Wyoming big sagebrush) or ARTRw/FEID (association level – Wyoming big sagebrush / Idaho fescue).. Note if the lek is located in non-habitat (e.g., agriculture, urban, industrial). If the lek is located on a road, livestock watering area, or similar type of surface within a plant community, indicate this cover type in the following manner: ARTRw:road; ARTRw:trough area.

3. Indicator Measurement Directions:

**Availability of Sagebrush Cover:** Adjacent sagebrush distance is measured from the edge of the lekking area to the edge of the nearest stand of mature sagebrush of sufficient extent to provide protective cover.

**Proximity of Trees or Other Tall Structures:** Trees and tall structures are considered "within the vicinity" when these tall structures provide avian perch sites with a view of birds on the lek.

4. Each indicator must be marked as suitable, marginal, or unsuitable. Mark a ✓ in the appropriate suitability category.

5. **Site-Scale Suitability:** Overall suitability takes into consideration the relationship between the indicators and their relative importance. This evaluation is based on professional judgment using the indicators for guidance. Explain overall site suitability in the rationale section.

6. **Anthropogenic Noise Description:** Indicate the presence of and describe any anthropogenic noises observed during the lekking period. Identify the noise source (highway vehicles, generator, wind turbines, military over-flights, etc.) and describe the occurrence frequency (constant or periodic), volume (loud to soft), and pitch (high to low). Use a decibel meter, if available, to record data when anthropogenic noises are a concern for the lek.

7. Attach photographs of the lek site.

8. Provide a copy of this form to the state wildlife agency coordinator for sage-grouse conservation.

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# Sage-Grouse Habitat Suitability Worksheet – Upland Summer Habitat

**(Source: Stiver *et al.* 2010, page III-14)**

| | | | |
|---|---|---|---|
| Date: | County: | State: | Subpopulation: |
| Evaluators: | | | Home Range Name: |
| Legal Description: T. R. Sections | | | Associated Leks: |
| Land Cover Type: | | | Ecological Site: |
| Number of Transects: | | | Area Sampled (ha or acres) |
| List UTM Coordinates (Coordinates, Zone, Datum) of All Transect: | | | |

**Habitat Indicator Suitability Range**

| Habitat Indicator | $\bar{x}$ | Suitable | ☐ | Marginal | ☐ | Unsuitable | ☐ |
|---|---|---|---|---|---|---|---|
| Sagebrush Canopy Cover (mean) | | 10 to 25% | | 5 to < 10% or > 25% | | < 5% | |
| Sagebrush Height (mean) | | 40 to 80 cm | | 20 to < 40 or > 80 cm | | < 20cm | |
| Perennial Grass and Forb Canopy Cover (mean) | | ≥ 15 % | | 5 to < 15% | | < 5% | |
| Preferred Forb Availability (relative to site potential)<br><br>Number of Preferred Forb Species (*n*) | | Forbs are common with several preferred species present | | Forbs are common but only a few preferred species are present | | Preferred forbs are rare | |

**Site-Scale Suitability** ☐ ☐ ☐

| | | | | |
|---|---|---|---|---|
| Does site potential limit suitability? (circle one) | Yes | No | | |
| Drought Condition (circle one): | Extreme Drought | Severe Drought | Moderate Drought | Mid-Range |
| | Moderately Moist | Very Moist | Extremely Moist | |
| Rationale for Overall Suitability Rating: | | | | |

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# Sage-Grouse Habitat Suitability Worksheet – Upland Summer Habitat Directions

1. This worksheet is used to interpret field data collected using methods outlined in the Supplemental Data Collection section (PI / LIDF and belt transect) and summarized in the Seasonal Habitat Site-Scale Data Summary.

2. Complete all site location information at the top of the sheet. Be sure to list all UTM coordinates or other identifying feature of all sites being summarized. Most of the information should be self-explanatory except for the following:

   **Subpopulation:** Identify the subpopulation with which the habitat is associated. This definition also includes small populations.

   **Home Range Name:** Identify the home range area using a major drainage area or other distinguishing land feature (e.g., Little Lost River Home Range).

   **Associated Leks:** List the two largest active leks to which the breeding habitat is associated. Use identification numbers or names that are used in the state-wide database.

   **Land Cover Type:** Identify the plant cover type of the data. Use plant alliances or associations (Reid *et al*. 2002) for sagebrush or grassland communities; www.natureserve.org/explorer (International Classification of Ecological Communities) or other sampling strata used to describe the habitat (e.g., % sagebrush categories). Use the species Symbol (Table III - 2) for dominant species in the overstory and understory (Examples: ARTRw (alliance level – Wyoming big sagebrush) or ARTRw/FEID (association level – Wyoming big sagebrush / Idaho fescue).

   **Ecological Site:** Refer to soil maps and range site guides and record the appropriate ecological site. Use the species Symbol for dominant species in the overstory and understory.

   **Number of Transects:** Record the number of 50-m transects completed within the land cover type.

   **Area Sampled:** Record the total area of the land cover type sampled.

3. Transfer data from the Seasonal Habitat Site-Scale Data Summary to this form. Enter the appropriate mean ($\bar{x}$) and number (n) values where appropriate for the indicators in the column under $\bar{x}$.

4. Each indicator must be marked as suitable, marginal, or unsuitable. Mark the appropriate suitability category.

   **Preferred Forb Availability:** Check the appropriate suitability category based on data derived using the Preferred Forb Availability Data Form. Suitability evaluation must be relative to ecological site potential.

5. **Site-Scale Suitability**: Overall suitability takes into consideration the relationship between the indicators and their relative importance. This evaluation is based on professional judgment using the indicators for guidance. Explain overall site suitability in the rationale section.

6. **Site Potential:** Indicate if site potential is a factor for a suitability description of marginal or unsuitable. Explain further in the rationale section.

7. **Drought Condition:** Indicate the current drought condition using local weather station data or as reported for the region of concern on the National Weather Service website: www.ncdc.noaa.gov/oa/climate/research/us-drought- monthly.html

8. Attach field data sheet(s) and photographs used for this site-scale description.

9. Provide a copy of this form to the state wildlife agency coordinator for sage-grouse conservation.

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# Sage-Grouse Habitat Suitability Worksheet – Riparian Summer Habitat

**(Source: Stiver *et al.* 2010, page III-16)**

| | | | |
|---|---|---|---|
| Date: | County: | State: | Subpopulation: |
| Evaluators: | | | Home Range Name: |
| Legal Description: T. R. Sections | | | Associated Leks: |
| Land Cover Type: | | | Site Info. (circle one): Arid Site Mesic Site |
| Site Type (circle one) riparian areas, wetland/wet meadows, springs, lakebeds, all, other: | | | |
| Number of Transects: | | | Area (ha or acres) or Distance (km) Sampled: |
| List UTM Coordinates (Coordinates, Zone, Datum) of All Transect: | | | |

**Habitat Indicator Suitability Range**

| Habitat Indicator | x̄ | Suitable | ✔ | Marginal | ✔ | Unsuitable | ✔ |
|---|---|---|---|---|---|---|---|
| Riparian and Wet Meadow Stability (mode)<br>PFC (*n*)<br>FAR (*n*)<br>NF (*n*) | | Majority of areas are in PFC | | Majority of areas are FAR | | Majority of areas are NF | |
| Preferred Forb Availability (relative to site potential)<br>Number of Preferred Forb Species (*n*) | | Preferred forbs are common with several species present | | Preferred forbs are common but only a few species are present | | Preferred forbs are rare | |
| Proximity of Sagebrush Cover (mean) | | Sagebrush cover is adjacent to brood-rearing areas (< 90m ) | | Sagebrush cover is in close proximity to brood-rearing areas (90 to 275 m) | | Sagebrush cover is unavailable (> 275 m) | |

**Site-Scale Suitability** ☐ ☐ ☐

| | | | | |
|---|---|---|---|---|
| Drought Condition (circle one): | Extreme Drought | Severe Drought | Moderate Drought | Mid-Range |
| | Moderately Moist | Very Moist | Extremely Moist | |

Rationale for Overall Suitability Rating:

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# Sage-Grouse Habitat Suitability Worksheet – Riparian / Wet Meadow Summer Habitat Directions

1. This worksheet is used to interpret field data collected using methods outlined in the Supplemental Data Collection section (PFC and belt transect) and summarized in the Seasonal Habitat Site-Scale Data Summary.

2. Complete site location information at the top of the sheet. Be sure to list all UTM coordinates or other identifying feature of sites summarized. Most information should be self-explanatory except the following:

**Subpopulation:** Identify the subpopulation with which the habitat is associated. This definition also includes small populations.

**Home Range Name:** Identify the home range area using a major drainage area or other distinguishing land feature (e.g., Little Lost River Home Range).

**Associated Leks:** List the two largest active leks to which the breeding habitat is associated. Use identification numbers or names that are used in the state-wide database.

**Land Cover Type:** (Optional) Identify the wetland (Cowardin *et al*. 1979) or riparian type (regional classification systems) of the habitat sampled. This data may be important to record when more detailed descriptions of summer habitats are desired (i.e. with sites stratified by cover type).

**Arid Site:** Term applies to sagebrush ecological sites generally in the 25-30 cm precipitation zone. *Artemisia tridentata wyomingensis* is a common big sagebrush sub-species for this type of site.

**Mesic Site:** Term applies to sagebrush ecological sites generally in a >30 cm precipitation zone *Artemisia tridentata vaseyana* is a common big sagebrush sub-species for this type of site.

**Site Type:** Identify the type of habitat sites sampled.

**Number of Sampling Transects:** Record the number of 50-m transects/sites measured within land cover type.

**Area or Distance Sampled:** Record the total area/distance (for riparian areas) of site type/land cover sampled.

3. Transfer data from the Seasonal Habitat Site-Scale Data Summary to this form. Enter the appropriate mean ($\bar{x}$) and number (n) values, and PFC data where appropriate for the indicators in the column under $\bar{x}$.

4. Each indicator must be marked as suitable, marginal, or unsuitable. Mark the appropriate suitability category.

**Riparian and Wet Meadow Stability:** Record the number of sampling sites that were PFC, FAR, or NF (Pritchard *et al*. 1998, 2003). Current PFC data can be used, if available. If PFC data cannot be obtained from other sources or collected directly, then the other two indicators should be used to assess habitat suitability.

**Preferred Forb Availability:** Check the appropriate suitability category based on data derived using the Preferred Forb Availability Data Form. Suitability evaluation must be relative to ecological site potential.

**Proximity of Sagebrush Cover:** Distance is measured from the edge of the riparian or wetland area to the edge of the nearest stand of mature sagebrush of sufficient extent to provide protective cover.

5. **Site-Scale Suitability:** Overall suitability takes into consideration the relationship between the indicators and their relative importance. This evaluation is based on professional judgment using the indicators for guidance. Explain overall site suitability in the rationale section.

6. **Drought Condition:** Indicate the current drought condition using local weather station data or as reported for the region of concern on the National Weather Service website: www.ncdc.noaa.gov/oa/climate/research/us-drought-monthly.html

7. Attach field data sheet(s) and photographs used for this site-scale description.

8. Provide a copy of this form to the state wildlife agency coordinator for sage-grouse conservation.

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# Sage-Grouse Habitat Suitability Worksheet – Winter Habitat

**(Source: Stiver *et al.* 2010, page III-18)**

| | | | |
|---|---|---|---|
| Date: | County: | State: | Subpopulation: |
| Evaluators: | | | Home Range Name: |
| Legal Description: T. R. Sections | | | Associated Leks: |
| Land Cover Type: | | | Ecological Site: |
| Number of Transects: | | | Area Sampled (ha or acres): |
| List UTM Coordinates (Coordinates, Zone, Datum) of All Transect: | | | |

**Habitat Indicator Suitability Range**

| Habitat Indicator | $\bar{x}$ | Suitable | ✔ | Marginal | ✔ | Unsuitable | ✔ |
|---|---|---|---|---|---|---|---|
| Sagebrush Canopy Cover (mean) | | ≥ 10 % | | 5 to < 10% | | < 5% | |
| Sagebrush Height above Snow (mean) | | > 25 cm | | > 10 to < 25 cm | | < 10cm | |
| | | | | | | | |

**Site-Scale Suitability** ☐ ☐ ☐

Rationale for Overall Suitability Rating:

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# Sage-Grouse Habitat Suitability Worksheet – Winter Habitat Directions

1. This worksheet is used to interpret field data collected using methods outlined in the Supplemental Data Collection section (PI / LIDF) and summarized in the Seasonal Habitat Site-Scale Data Summary.

2. Complete all site location information at the top of the sheet. Be sure to list all UTM coordinates or other identifying feature of all sites being summarized. Most of the information should be self-explanatory except for the following:

   **Subpopulation:** Identify the subpopulation with which the habitat is associated. This definition also includes small populations.

   **Home Range Name:** Identify the home range area using a major drainage area or other distinguishing land feature (e.g., Little Lost River Home Range).

   **Associated Leks:** List the two largest active leks to which the breeding habitat is associated. Use identification numbers or names that are used in the state-wide database.

   **Land Cover Type:** Identify the plant cover type of the data. Use plant alliances or associations (Reid *et al*. 2002) for sagebrush or grassland communities; www.natureserve.org/explorer (International Classification of Ecological Communities) or other sampling strata used to describe the habitat (e.g., % sagebrush categories). Use the species Symbol (Table III - 2) for dominant species in the overstory and understory (Examples: ARTRw (alliance level – Wyoming big sagebrush) or ARTRw/FEID (association level
   – Wyoming big sagebrush / Idaho fescue).

   **Ecological Site:** Refer to soil maps and range site guides and record the appropriate ecological site. Use the species Symbol for dominant species in the overstory and understory.

   **Number of Transects:** Record the number of 50-m transects completed within the land cover type.

   **Area Sampled:** Record the total area of the land cover type sampled.

3. Transfer data from the Seasonal Habitat Site-Scale Data Summary to this form. Enter the mean ($\bar{x}$) for the indicators in the column under $\bar{x}$.

4. Each indicator must be marked as suitable, marginal, or unsuitable. Mark a ✓ in the appropriate suitability category.

5. Site-Scale Suitability: Overall suitability takes into consideration the relationship between the indicators and their relative importance. This evaluation is based on professional judgment using the indicators for guidance. Explain overall site suitability in the rationale section.

6. Attach field data sheet(s) and photographs used for this site-scale description.

7. Provide a copy of this form to the state wildlife agency coordinator for sage-grouse conservation.

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# Point Intercept Data Form

| | | | |
|---|---|---|---|
| Date: | State: | County: | Subpopulation: |
| Examiner(s): | | | Home Range Name: |
| Legal Description T. R. Section ¼, ¼ | | | Associated Leks: |
| Land Cover Type: | | | Ecological Site: |
| Seasonal Habitat: | | | Site Info. (circle one) Arid Site Mesic Site |
| Transect # | Area (ha) sampled: | | UTM: |

# Transect Data Summary (see directions)

| Shrub | Forbs | Grasses |
|---|---|---|
| Sagebrush Canopy Cover<br><br>Hits#_____, %_____ | Perennial Forb Canopy Cover<br><br>PF Hits:# ____, %_____ | Perennial Grass Canopy Cover<br><br>PG Hits: #_____, %_____ |
| Avg. Height (cm)<br><br>Sagebrush Shape Hits (%)<br><br>S:____, M:_____, C:_____ | Annual Forb Canopy Cover<br><br>PF Hits:# ____, %_____ | Annual Grass Canopy Cover<br><br>PG Hits: #_____, %_____ |
| Shrub Canopy Cover<br><br>Hits #_____, %_____ | Total Forb Canopy Cover<br><br>PF & AF Hits: ____, %_____<br>Avg PF Height (cm): | Total Grass Canopy Cover<br><br>PG & AG Hits: ____, %_____<br>Avg. PG Height (cm): |

| Pts. | Hits: Top Layer | | Shape | Lower Canopy Hits | | | | Soil | Pts. | Hits: Top Layer | | Shape | Lower Canopy Hits | | | | Soil |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Layer 2 | | Layer 3 | | | | | | | Layer 2 | | Layer 3 | | |
| | Species | Ht. | | Species | Ht. | Species | Ht. | | | Species | Ht. | | Species | Ht | Species | Ht. | |
| 1 | | | | | | | | | 26 | | | | | | | | |
| 2 | | | | | | | | | 27 | | | | | | | | |
| 3 | | | | | | | | | 28 | | | | | | | | |
| 4 | | | | | | | | | 29 | | | | | | | | |
| 5 | | | | | | | | | 30 | | | | | | | | |
| 6 | | | | | | | | | 31 | | | | | | | | |
| 7 | | | | | | | | | 32 | | | | | | | | |
| 8 | | | | | | | | | 33 | | | | | | | | |
| 9 | | | | | | | | | 34 | | | | | | | | |
| 10 | | | | | | | | | 35 | | | | | | | | |
| 11 | | | | | | | | | 36 | | | | | | | | |
| 12 | | | | | | | | | 37 | | | | | | | | |
| 13 | | | | | | | | | 38 | | | | | | | | |
| 14 | | | | | | | | | 39 | | | | | | | | |
| 15 | | | | | | | | | 40 | | | | | | | | |
| 16 | | | | | | | | | 41 | | | | | | | | |
| 17 | | | | | | | | | 42 | | | | | | | | |
| 18 | | | | | | | | | 43 | | | | | | | | |
| 19 | | | | | | | | | 44 | | | | | | | | |
| 20 | | | | | | | | | 45 | | | | | | | | |
| 21 | | | | | | | | | 46 | | | | | | | | |
| 22 | | | | | | | | | 47 | | | | | | | | |
| 23 | | | | | | | | | 48 | | | | | | | | |
| 24 | | | | | | | | | 49 | | | | | | | | |
| 25 | | | | | | | | | 50 | | | | | | | | |

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# Point Intercept Method

**Equipment:**

| | |
|---|---|
| Tape, 50-m (optional) | Stakes for tape (at least two spikes; old, medium-large screwdrivers work well) |
| Pin flag or Pointer or other Point Intercept device: straight piece of wire or rod at least 1m long and less than 2.5mm in diameter | Meterstick (for measuring shrub and grass/forb heights) |
| Digital camera, extra camera battery | Photo cards and markers, or small dry-erase board and marker |
| Topographic map with project area, general cover types, and pasture boundaries delineated | Aerial photographs |
| Ecological Site Guides | GPS unit, compass |
| Forms and/or Data Logger with extra battery, Pencils | Calculator |

**Protocol:**

- Seasonal habitat has been stratified by land cover types prior to field evaluation (see HAF Vol. II document for more directions).
- Repeat all steps for a minimum of 4 transects per land cover type.

1. Complete all site location information at the top of the sheet. Be sure to list UTM coordinates or other identifying feature of the site. Most of the information should be self-explanatory except for the following:

**Subpopulation:** Identify the subpopulation with which the habitat is associated. This definition also includes small populations.

**Home Range Name:** Identify the home range area using a major drainage area or other distinguishing land feature (e.g., Little Lost River Home Range).

**Associated Leks:** List the two largest active leks to which the breeding habitat is associated. Use identification numbers or names that are used in the state-wide database.

**Land Cover Type:** Identify the land cover type of the data. Use plant alliances or associations (Reid *et al.* 2002) for sagebrush or grassland communities; www.natureserve.org/explorer (International Classification of Ecological Communities) or other sampling strata used to describe the habitat (e.g., % sagebrush categories). Use the species Symbol (Table III - 2) for dominant species in the overstory and understory (Examples: ARTRw (alliance level – Wyoming big sagebrush) or ARTRw/FEID (association level – Wyoming big sagebrush / Idaho fescue).

**Ecological Site:** Refer to soil maps and range site guides and record the appropriate ecological site. Use the species Symbol for dominant species in the overstory and understory.

**Seasonal Habitat:** List one of the following: breeding, summer, or winter.

**Arid Site:** Term applies to sagebrush ecological sites generally in the 25-30 cm precipitation zone. *Artemisia tridentata wyomingensis* is a common big sagebrush sub-species for this type of site.

**Mesic Site**: Term applies to sagebrush ecological sites generally in a >30 cm precipitation zone *Artemisia tridentata vaseyana* is a common big sagebrush sub-species for this type of site.

**Transect #:** Assign a unique transect identifier for each transect within the land cover type.

**Area Sampled:** Record the total area or distance (for riparian areas) of the site type or land cover type sampled.

2. Anchor the tape with a steel pin and pull the tape out 50 meters. Keep the tape as taught and straight as possible. Anchor the tape on the far end.

3. Take photographs of the study site. At least one photograph must be taken at each transect/evaluation area. Photos will prove invaluable in locating evaluation areas in subsequent years. They will also be of substantial utility in the office when preparing evaluation documents and documenting habitat condition.
   a. Complete a photo card, showing, at a minimum, the date, location, allotment, and sagebrush canopy cover percentage.
   b. With the photo card near the zero end of the tape, take a general photo of the area, sighting down the tape from eye level, showing landmarks in the background, if possible. A cover board or meter stick should be in the picture for a frame of reference.
   c. In a representative location along or near the tape, place the photo card near the base of a sagebrush plant, and take a tangential close-up photo from near ground level (2-3 ft) toward the shrub/ground interface, to document herbaceous conditions and cover. A cover board or meter stick should be in the picture for a frame of reference.

d. Optional: take one or more other close-ups or panoramic photos as needed.

4. Begin at the "0" end of the tape.

5. Every 1 meter place the pin in the ground so that it is angled precisely vertically and touches the near side of the tape at the correct interval point (every 1 m for 50 marks).

6. Measure canopy cover at each pin point:
   a. Record the plant with the highest leaf or stem touching the pin. Record only live canopies of shrubs and live or residual cover of herbaceous plants (remember that residual plant cover can be very important for sage-grouse nesting) under the Species column of Top Layer hits, using the species acronyms. See Monitoring of Greater Sage-grouse Habitats and Populations http://sagemap.wr.usgs.gov/docs/grouse_habitat_book.pdf and http://www.cnr.uidaho.edu/range357/notes/cover.pdf for discussions on canopy cover.
   b. Record the next different life form species with the highest leaf or stem touching the pin. Record these under the Species column within the Lower Canopies columns. Only one hit per life form can be recorded unless the 2nd hit is a basal hit. For example, do not record more than one shrub hit or one perennial grass hit per pin point.

7. Record soil surface type and life forms (tree, shrub, perennial grass and forb, annual grass and forb) by species:
   a. Record soil surface.
      - Use the following abbreviations for soil surface type: R = Rock Fragment (>5mm diameter); BR = Bedrock; M = Moss; LC = Visible Lichen Crust on soil; S = Soil, without any other soil surface code; EL = Embedded Litter; D = Duff.
   b. Record life form species when present.
      - When possible use the scientific name acronyms for plant cover species (e.g., Artemisia tridentata wyomingensis = ARTRw; Table III - 2). Make a list of those you will likely encounter in data collection before going to the field.
      - When species cannot be identified, record genus. If genus is unknown, use the following life form abbreviations: TR = Tree; SH = Shrub; PG = Perennial Grass; PF = Perennial Forb; AG = Annual Grass; AF = Annual Forb.

8. Measure plant heights:
   a. Shrubs.
      - Record the maximum height in cm of the shrub that is touched by the pin, excluding flower or seed stalks.
      - Record the shape of sagebrush only: S = Spreading; M = Mixed; C = Columnar (Figure III - 7).
   b. Perennial Grasses and Forbs:
      - Record the natural or droop height in cm of the perennial grass or perennial forb touched by the pin. [Natural = the highest point measured with no straightening by the observer, Figure III - 8]. This includes seed and flower stalks when they contribute to the body of the plant that provides screening cover. There will be instances (e.g., certain *Poa* spp.) when only a few, sparse seed stalks are present and extend well above the body of the plant that provides the cover. In these cases the droop height of the plant *exclusive of the seed stalks* should be measured. This will require some professional judgment on the part of the biologist (see illustration in).

9. Proceed to the next point or intercept and repeat for 50 total hits.

10. Summarize the data at the top of the form. Only one hit per lifeform (one shrub, forb, and grass each) per point can be used in the summary.
    a. Shrubs.
       - Sagebrush Canopy Cover: Hits = # of sagebrush hits, % cover = # of hits divided by the total number of transect points
       - Avg. Height = sum of all sagebrush recorded heights divided by total number of sagebrush plants measured
       - Sagebrush Shape Hits = total # of sagebrush plants of each shape (S, M, and C) divided by total number of sagebrush plants measured
       - Shrub Canopy Cover: Hits = # of total shrub hits, % cover = # of hits divided by the total number of transect points
    b. Forbs.
       - Perennial Forb Canopy Cover: PF Hits = # of perennial forb hits, % cover = # of hits divided by total number of transect points
       - Annual Forb Canopy Cover: AF Hits = # of annual forb hits, % cover = # of hits divided by total number of transect points
       - Total Forb Canopy Cover: PF&AF Hits = # of perennial and annual forb hits, % cover = # total forb hits divided by total number of transect points (There may be instances where a perennial and annual forb hit is recorded for one point. In these instances the upper layer hit is the only one that should be included for that point in calculating combined cover.)
       - Avg. PF Height = sum of all perennial forb recorded heights divided by total number of perennial forbs measured

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c. Grasses.
   - Perennial Grass Canopy Cover: PG Hits = # of perennial grass hits, % cover = # of hits divided by total number of transect points
   - Annual Grass Canopy Cover: AG Hits = # of annual grass hits, % cover = # of hits divided by total number of transect points
   - Avg. PG Height = sum of all perennial grass recorded heights divided by total number of perennial grass plants measured
   - Avg. PG&PF Heights = sum of all perennial grass and perennial forb recorded heights divided by total number measured

11. Complete the Sage-Grouse Preferred Forb Availability Data Form.

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# Supplemental Data Collection Support

## Introduction

Measuring vegetation at the site-scale generally involves field data collection on composition and structure of over-story and understory habitat within a seasonal use area (Table III - 1). There are a few other measurements (e.g., proximity to sagebrush) for some seasonal habitats as well. This appendix describes methods to measure vegetation at the site-scale and how to use habitat indicators to describe habitat. Sampling design including further stratification of fine-scale land cover types was described in Volume II.

Connelly *et al.* (2003) discussed methods to measure vegetation at the site-scale for describing sage-grouse habitat. In addition, Elzinga *et al.* (1998) and Herrick *et al.* (2005) provide background information and examples of ways to measure vegetation for site-scale habitat indicators. Connelly *et al.* (2003) preferred Canfield's (1941) line intercept method for sage-grouse habitat descriptions but determined that point intercept or quadrat sampling is faster than line intercept and yields the same results. Two data collection methods that have been used to describe sage-grouse habitat descriptions, point intercept (PI) and line intercept – Daubenmire frame (LIDF), are presented. Both methods provide comparable results and their advantages and disadvantages are discussed in Elzinga (1998), Connelly *et al.* (2003) and Herrick *et al.* (2005).

Illustrations for field measurements are provided below. In addition, data forms are provided with detailed procedures on the back of the forms.

## Transect Set-up for PI Method

Data should be collected along at least four 50-m transects within each cover type, and measurements should be taken every 1-2 meters. For the PI method, at least 200 points per cover type should be sampled in order to increase the likelihood that sparsely distributed forbs are sampled (Elzinga *et al.* 1998). More transects may be needed based on vegetation heterogeneity or specific local habitat needs.

After the line transect has been laid out but before collecting data, take a picture of the transect line with transect identification information and the date clearly visible. Pictures are part of the data collected and may be extremely valuable in the future for detecting habitat change and ensuring repeatability in monitoring efforts.

The PI method provides canopy cover estimates by dropping a long ($\geq$ 1 m), small diameter (< 2.5 mm) pin at a specific intervals along a transect line (Figure III - 3). Four 50-m transects with measurements taken at 1-m intervals are recommended. When the pin is dropped, any plant or ground cover that touches the pin at that point is recorded as a "hit" (Figure III - 4). Starting at the top of the pin and working down, record only one hit per life form (shrub, perennial grass, perennial forb, annual grass, annual forb, litter or soil). Canopy cover by life form is determined by the number of hits along transects (e.g., 40 hits in 1-m intervals along a 200-m transect = 20% canopy cover). Life form heights and sagebrush shape should be noted as well.

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## Data Collection for Habitat Indicators

**Shrub Canopy Cover:**
Shrub cover is determined by the actual live shrub 'hits' on the transect line including leaves, live stems, and shrub trunk hits. PI technically measures foliar cover, not canopy cover. PI can be made equivalent to LIDF canopy cover measurements if the same gap criteria for LIDF are applied to PI. For example, if the pin ends up in a gap in the foliage that is less than 5 cm then it would be recorded as a hit to get a canopy cover reading.

*Note dead shrubs (winter kill, Aroga moth) or other unusual conditions that are observed.*

**Sagebrush Height:** Measure the tallest point of the shrub excluding flower or seed stalks.

**Sagebrush Shape:** Describe the sagebrush plant as predominately columnar (C), spreading (S) or mixed (M) using the provided site guide as a reference (Figure III - 7).

**Perennial Grass Height:** Record maximum "natural" or droop (the highest point measured with no straightening by the observer) height of the perennial grass, residual or live plant parts (Figure III - 8) (both native and exotic). This measurement should include seed stalks when they contribute to the body of the plant that provides cover (e.g., *Pseudoroegneria spicata*). However, there are some cases where only a one or two seed stalks extend above the body of the plant and do not provide cover (e.g., *Poa secunda* that has been grazed). In these cases, measure the natural or droop height *exclusive* of the seed stalk.

**Perennial Forb Height:** Record "natural" or droop (the highest point measured with no straightening by the observer) height of the perennial forb, residual or live plant parts (Figure III - 8). The measurement includes flower stalks and heads when they contribute to the body of the plant that provides protective cover.

**Annual Forb Cover:** Same as above.

**Perennial Grass and Forb Cover:** Measure the live and residual foliar cover. Record a hit when the pin touches a live or residual herbaceous plant part (Figure III - 4). Record by species, or genus if species is unknown.

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Table III - 1. List of seasonal habitat measurements and associated data collection methods.
PI = Point intercept, LIDF = Line intercept – Daubenmire frame, PFC = Proper Functioning Condition.

| Seasonal Habitat | Habitat Indicator | Life Requisite(s) | Measurement Technique |
|---|---|---|---|
| **Lek** | Availability of Sagebrush Cover | Cover | Field or remote sensing measurement |
| | Proximity of Trees or Other Tall Structures | Cover | Field or remote sensing measurement |
| **Breeding** | Sagebrush Canopy Cover | Cover, Food | PI / LIDF |
| | Sagebrush Height | Cover | PI / LIDF |
| | Predominant Sagebrush Shape | Cover | PI / LIDF |
| | Perennial Grass and Forb Height | Cover | PI / LIDF |
| | Perennial Grass Canopy Cover | Cover | PI / LIDF |
| | Perennial Forb Canopy Cover | Cover | PI / LIDF |
| | Preferred Forb Availability | Food | Belt transect |
| **Summer** – Riparian | Riparian and Wet Meadow Stability | Cover, Food | PFC data, if available |
| | Preferred Forb Availability | Food | Belt transect |
| | Proximity of Sagebrush Cover | Cover | Field or remote sensing measurement |
| **Summer** – Upland | Sagebrush Canopy Cover | Cover, Food | PI / LIDF |
| | Sagebrush Height | Cover | PI / LIDF |
| | Perennial Grass and Forb Canopy Cover | Cover | PI / LIDF |
| | Preferred Forb Availability | Food | Belt transect |
| **Winter** | Sagebrush Canopy Cover | Cover, Food | PI / LI (part of LIDF) |
| | Sagebrush Height Above Snow | Cover | PI / Vegetation Height (part of LIDF) |

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Table III - 2. Sagebrush community vegetation species and preferred forbs for sage-grouse. To be used for PI, LIDF, and belt transect data collection. Space is provided for addition of local species.
* P = Preferred forb, W = (Noxious) weeds, I = Invasive annuals, O = Other forbs, N/A = Not applicable

| Scientific Name | Common Name | Symbol | Most Likely Category* |
|---|---|---|---|
| **SHRUBS** | | | |
| **Dwarf sagebrush** | | | |
| *Artemisia arbuscula* | Low sagebrush | ARAR8 | N/A |
| *A. arbuscula* ssp. *longicaulis* | Lahontan sagebrush | ARARl3 | N/A |
| *A. arbuscula* ssp. *longiloba* | Early sagebrush | ARARl | N/A |
| *A. bigelovii* | Bigelow sage | ARBI3 | N/A |
| *A. nova* | Black sagebrush | ARNO4 | N/A |
| *A. papposa* | Fuzzy sage | ARPA16 | N/A |
| *A. pygmaea* | Pygmy sagebrush | ARPY2 | N/A |
| *A. rigida* | Stiff sagebrush | ARRI2 | N/A |
| *A. spinescens*<br>Syn = *Picrothamnus desertorum* | Bud sagebrush | ARSP5 / PIDE4 | N/A |
| *A. tripartita* ssp. *rupicola* | Wyoming threetip sagebrush | ARTRr2 | N/A |
| *Tanacetum nuttallii*<br>Syn = *Sphaeromeria argentea* | Chicken sage | TANU2 / SPAR2 | N/A |
| **Tall sagebrush** | | | |
| *A. cana* ssp. *bolanderi* | Bolander's silver sagebrush | ARCAb3 | N/A |
| *A. cana* ssp. c*ana* | Plains silver sagebrush | ARCAc5 | N/A |
| *A. cana* ssp. v*iscidula* | Mountain silver sagebrush | ARCAv2 | N/A |
| *A. tridentata* ssp. *spiciformis* | Subalpine big sagebrush | ARTRs2 | N/A |
| *A. tridentata* ssp. *tridentata* | Basin big sagebrush | ARTRt | N/A |
| *A. tridentata* ssp. *vaseyana* | Mountain big sagebrush | ARTRv | N/A |
| *A. tridentata* var. *pauciflora*<br>Syn = *A. tridentata* ssp. *vaseyana* | Few-flowered mountain big sagebrush | ARTRp4 / ARTRv | N/A |
| *A. tridentata* ssp. *wyomingensis* | Wyoming big sagebrush | ARTRw8 | N/A |
| *A. tridentata* ssp. *xericensis* | Xeric big sagebrush | ARTRx | N/A |
| *A. tripartita* ssp. *tripartita* | Threetip sagebrush | ARTRt2 | N/A |
| **Subshrub sagebrush** | | | |
| *A. frigida* | Fringed sagewort | ARFR4 | N/A |
| *A. pedatifida* | Birdfoot sagebrush | ARPE6 | N/A |
| **Other shrubs** | | | |
| *Amelanchier alnifolia* | Saskatoon serviceberry | AMAL2 | N/A |
| *Amelanchier utahensis* | Utah serviceberry | AMUT | N/A |
| *Ceanothus velutinus* | Snowbrush caenothus | CEVE | N/A |
| *Chrysothamnus nauseosus*<br>Syn = *Ericameria nauseosa* ssp. *nauseosa* var. *nauseosa* | Rubber rabbitbrush | CHNA2 / ERNAn5 | N/A |
| *Chrysothamnus viscidiflorus* | Green rabbitbrush | CHVI8 | N/A |
| *Gutierrezia sarothrae* | Broom snakeweed | GUSA2 | N/A |
| *Juniperus occidentalis* | Western juniper | JUOC | N/A |

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| Scientific Name | Common Name | Symbol | Most Likely Category* |
|---|---|---|---|
| *Juniperus osteosperma* | Utah juniper | JUOS | N/A |
| *Pachystima myrsinites* | Pachystima | PAMY2 | N/A |
| *Purshia tridentata* | Antelope bitterbrush | PUTR2 | N/A |
| *Rosa woodsii* | Woods' rose | ROWO | N/A |
| *Sarcobatus vermiculatus* | Greasewood | SAVE4 | N/A |
| *Symphoricarpos albus* | Common snowberry | SYAL | N/A |
| *Symphoricarpos oreophilus* | Mountain snowberry | SYOR2 | N/A |
| *Tetradymia canescens* | Spineless horsebrush | TECA2 | N/A |
| *Atriplex confertifolia* | 4-wing saltbush | ATCO | |
| *Ceratoides lanata* | Winterfat | CELA | |
| *Grayia spinosa* | | GRSP | |
| **FORBS** | | | |
| **Annuals / Occasionally Biennials** | | | |
| *Alyssum desertorum* | Desert alyssum | ALDE | I |
| *Asperugo procumbens* | German-madwort | ASPR | I |
| *Camelina microcarpa* | Littlepod false flax | CAMI2 | I |
| *Carthamus tinctorius* | Safflower | CATI | W |
| *Chenopodium album* | Lambsquarters | CHAL7 | P |
| *Chenopodium fremontii* | Fremont's goosefoot | CHFR3 | P |
| *Chenopodium leptophyllum* | Narrowleaf goosefoot | CHLE4 | P |
| *Chorispora tenella* | Purple mustard | CHTE2 | W |
| *Collinsia parviflora* | Blue eyed Mary | COPA3 | P |
| *Collomia grandiflora* | Grand collomia | COGR4 | P |
| *Collomia linearis* | Tiny trumpet | COLI2 | P |
| *Cryptantha scoparia* | Pinyon desert cryptantha | CRSC2 | P |
| *Descurainia pinnata* | Western tansymustard | DEPI | I |
| *Descurainia richardsonii*<br>Syn = *Descurainia incana* ssp. *incana* | Tansymustard | DERI2 / DEINi | I |
| *Descurainia sophia* | Herb sophia | DESO2 | I |
| *Epilobium minutum* | Chaparral willowherb | EPMI | P |
| *Epilobium paniculatum*<br>Syn = *Epilobium brachycarpum* | Tall annual willow-herb | EPPA2 / EPBR3 | P |
| *Eriastrum sparsiflorum* | Great Basin woollystar | ERSP3 | P |
| *Eriogonum* spp. | Buckwheat | ERIOG | P |
| *Erodium cicutarium* | Stork's bill | ERCI6 | P |
| *Galium aparine* | Stickywilly | GAAP2 | I |
| *Halogeton glomeratus* | Saltlover | HAGL | I |
| *Helianthus annuus* | Common sunflower | HEAN3 | P |
| *Kochia scoparia* | Kochia | KOSC | W |
| *Lactuca serriola* | Prickly lettuce | LASE | P |
| *Lappula texana*<br>Syn = *Lappula occidentalis* var. *cupulata* | Flatspine stickseed | LATE3 / LAOCc | I |
| *Lepidium perfoliatum* | Clasping pepperweed | LEPE2 | I |
| *Lepidium virginicum* | Virginia pepperweed | LEVI3 | I |
| *Medicago hispida*<br>Syn = *Medicago polymorpha* | Burclover | MEHI / MEPO3 | P |

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| Scientific Name | Common Name | Symbol | Most Likely Category* |
|---|---|---|---|
| *Medicago sativa* | Alfalfa | MESA | P |
| *Melilotus officinalis* | Yellow sweetclover | MEOF | P |
| *Microsteris gracilis*<br>Syn = *Phlox gracilis* ssp. *gracilis* | Mircrosteris | MIGR / PHGRg | P |
| *Philox gracilis* | Slender philox | PHGR16 | P |
| *Plantago patagonica* | Woolly plantain | PLPA2 | P |
| *Plectritis macrocera* | Plectritis | PLMA4 | P |
| | | | |
| *Polygonum aviculare* | Prostrate knotweed | POAV | P |
| *Ranunculus testiculatus*<br>Syn = *Ceratocephala testiculata* | Bur buttercup | RATE / CETE5 | W |
| *Salsola kali* | Russian thistle | SAKA | W |
| *Thlaspi arvense* | Field pennycress | THAR5 | I |
| *Tragopogon dubius* | Salsify | TRDU | P |
| *Trifolium* spp. | Clover | TRIFO | P |
| *Veronica biloba* | Speedwell | VEBI2 | I |
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| **Biennials** | | | |
| *Cirsium* spp. | Thistle | CIRSI | W |
| *Cynoglossum officinale* | Hounds tongue | CYOF | W |
| *Gilia aggregata*<br>Syn = *Ipomopsis aggregata* ssp. *aggregata* | Scarlet gilia | GIAG / IPAGa3 | P |
| *Machaeranthera canescens* | Hoary aster | MACA2 | P |
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| **Perennials / Occasionally Biennials** | | | |
| *Achillea millefolium* | Common yarrow | ACMI2 | P |
| *Agoseris glauca* | Pale agoseris | AGGL | P |
| *Allium acuminatum* | Tapertip onion | ALAC4 | P |
| *Antennaria dimorpha* | Low pussytoes | ANDI2 | P |
| *Antennaria* spp. | Pussytoes | ANTEN | P |
| *Arabis holboellii* | Holboell's rockcress | ARHO2 | P |
| *Arenaria kingii* | King's sandwort | ARKI | P |
| *Artemisia dracunculus* | Tarragon | ARDR4 | P |
| *Aster chilensis*<br>Syn = *Symphyotrichum chilense* var. *chilense* | Pacific aster | ASCH2 / SYCHc | P |

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| Scientific Name | Common Name | Symbol | Most Likely Category* |
|---|---|---|---|
| *Astragalus argophyllus* | Silverleaf milkvetch | ASAR4 | P |
| *Astragalus beckwithii* | Beckwith's milkvetch | ASBE3 | P |
| *Astragalus calycosus* | Torrey's milkvetch | ASCA9 | P |
| *Astragalus convallarius* | Lesser rushy milkvetch | ASCO12 | P |
| *Astragalus lentiginosus* | Freckled milkvetch | ASLE8 | P |
| *Astragalus purshii* | Woollypod milkvetch | ASPU9 | P |
| *Balsamorhiza hookeri* | Hooker's balsamroot | BAHO | P |
| *Balsamorhiza sagittata* | Arrowleaf balsamroot | BASA3 | P |
| *Berberis repens* | Creeping barberry | MARE11 | P |
| *Calochortus nuttallii* | Sego lily | CANU3 | P |
| *Castilleja chromosa*<br>Syn = *Castilleja applegatei* ssp. *martinii* | Wavyleaf Indian paintbrush | CACH7 / CAAPm | P |
| *Castilleja linariifolia* | Wyoming Indian paintbrush | CALI4 | P |
| *Chaenactis douglasii* | Douglas's dustymaiden | CHDO | P |
| *Comandra umbellata* | Bastard toadflax | COUM | P |
| *Convolvulus arvensis* | Field bindweed | COAR4 | W |
| *Crepis acuminata* | Tapertip hawksbeard | CRAC2 | P |
| *Crepis* spp. | Hawksbeard | CREPI | P |
| *Cymopterus* spp. | Springparsley | CYMOP2 | P |
| *Delphinium nuttallianum* | Twolobe larkspur | DENU2 | P |
| *Erigeron corymbosus* | Longleaf fleabane | ERCO5 | P |
| *Erigeron humilis* | Arctic alpine fleabane | ERHU | P |
| *Erigeron pumilus* | Shaggy fleabane | ERPU2 | P |
| *Eriogonum microthecum* | Slender buckwheat | ERMI4 | P |
| *Eriogonum ovalifolium* | Cushion buckwheat | EROV | P |
| *Eriogonum umbellatum* | Sulfur-flower buckwheat | ERUM | P |
| *Erysimum asperum*<br>Syn = *Erysimum capitatum* var. *capitatum* | Sanddune wallflower | ERAS2 / ERCAc | P |
| *Fritillaria pudica* | Yellow fritillary | FRPU2 | P |
| *Geranium viscosissimum* | Sticky purple geranium | GEVI2 | P |
| *Geum macrophyllum* | Largeleaf avens | GEMA4 | P |
| *Grindelia squarrosa* | Curlycup gumweed | GRSQ | I |
| *Hackelia patens* | Spotted stickseed | HAPA | I |
| *Haplopappus acaulis*<br>Syn = *Stenotus acaulis* var. *acaulis* | Stemless mock goldenweed | HAAC / STACa | P |
| *Hedysarum* spp. | Sweetvetch | HEDYS | P |
| *Helianthella uniflora* | Oneflower helianthella | HEUN | P |
| *Hydrophyllum capitatum* | Ballhead waterleaf | HYCA4 | P |
| *Iva axillaris* | Povertyweed | IVAX | P |
| *Lathyrus nevadensis* | Sierra pea | LANE3 | P |
| *Leptodactylon pungens*<br>Syn = *Linanthus pungens* | Granite prickly phlox | LEPU / LIPU11 | P |
| *Linanthus* spp. | Linanthus | LINAN2 | P |
| *Linum perenne* | Blue flax | LIPE2 | P |
| *Lithophragma* spp. | Woodland-star | LITHO2 | P |
| *Lithospermum ruderale* | Western stoneseed | LIRU4 | P |

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| Scientific Name | Common Name | Symbol | Most Likely Category* |
|---|---|---|---|
| *Lomatium grayi* | Gray's biscuitroot | LOGR | P |
| *Lomatium triternatum* | Nineleaf biscuitroot | LOTR2 | P |
| *Lomatium* spp. | Desertparsley | LOMAT | P |
| *Lotus corniculatus* | Bird's-foot trefoil | LOCO6 | P |
| *Lupinus argenteus* | Silvery lupine | LUAR3 | O |
| *Lupinus leucophyllus* | Velvet lupine | LULE3 | O |
| *Lupinus* spp. | Lupine | LUPIN | O |
| *Lygodesmia juncea* | Rush skeletonplant | LYJU | P |
| *Mentha piperita*<br>Syn = *Mentha aquatica* | Water mint | MEPI / MEAQ | I |
| *Mertensia oblongifolia* | Oblongleaf bluebells | MEOB | P |
| *Microseris nigrescens*<br>Syn = *Nothocalais nigrescens* | Meadow prairie-dandelion | MINI3 / NONI | P |
| *Microseris* spp. | Silverpuffs | MICRO6 | P |
| *Oenothera pallida* | Pale evening-primrose | OEPA | P |
| *Opuntia polyacantha* | Plains pricklypear | OPPO | N/A |
| *Penstemon cyaneus* | Blue penstemon | PECY3 | P |
| *Penstemon procerus* | Littleflower penstemon | PEPR2 | P |
| *Penstemon* spp. | Beardtongue | PENST | P |
| *Perideridia* spp. | Yampah | PERID | P |
| *Phacelia hastata* | Silverleaf phacelia | PHHA | P |
| *Phlox hoodii* | Spiny phlox | PHHO | P |
| *Phlox longifolia* | Longleaf phlox | PHLO2 | P |
| *Rumex salicifolius* | Willow dock | RUSA | P |
| *Sanguisorba minor* | Small burnet | SAMI3 | P |
| *Sedum lanceolatum* | Spearleaf stonecrop | SELA | P |
| *Senecio dimorphophyllus*<br>Syn = *Packera dimorphophylla* ssp. *dimorphophylla* | Splitleaf groundsel | SEDI4 / PADId2 | P |
| *Senecio integerrimus* | Lambstongue ragwort | SEIN2 | P |
| *Senecio streptanthifolius*<br>Syn = *Packera streptanthifolia* | Rocky Mountain groundsel | SEST3 / PAST10 | P |
| *Smilacina racemosa*<br>Syn = *Maianthemum racemosum* ssp. *racemosum* | Feathery false lily of the valley | SMRA / MARAr | P |
| *Solidago missouriensis* | Missouri goldenrod | SOMI2 | P |
| *Sphaeralcea munroana* | Munro's globemallow | SPMU2 | P |
| *Sphaeralcea* spp. | Globemallow | SPHAE | P |
| *Taraxacum officinale* | Common dandelion | TAOF | P |
| *Viola nuttallii* | Nuttall's violet | VINU2 | P |
| *Viola purpurea* | Goosefoot violet | VIPU4 | P |
| *Wyethia amplexicaulis* | Mule-ears | WYAM | P |
| *Zigadenus paniculatus* | Foothill deathcamus | ZIPA2 | P |
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| Scientific Name | Common Name | Symbol | Most Likely Category* |
|---|---|---|---|
| | | | |
| | | | |
| **GRASSES** | | | |
| **Annuals** | | | |
| *Avena fatua* | Wild oat | AVFA | N/A |
| *Bromus commutatus*<br>Syn = *Bromus racemosus* | Bald brome | BRCO4 / BRRA2 | N/A |
| *Bromus japonicus* | Japanese brome | BRJA | N/A |
| *Bromus mollis*<br>Syn = *Bromus hordeaceus* ssp. *hordeaceus* | Soft brome | BRMO2 / BRHOh | N/A |
| *Bromus tectorum* | Cheatgrass | BRTE | N/A |
| *Festuca octoflora* | Sixweeks fescue | FEOC3 | N/A |
| *Triticum aestivum* | Common wheat | TRAE | N/A |
| | | | |
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| **Perennials** | | | |
| *Agropyron cristatum* | Crested wheatgrass | AGCR | N/A |
| *Agropyron intermedium*<br>Syn = *Thinopyrum intermedium* | Intermediate wheatgrass | AGIN2 / THIN | N/A |
| *Agropyron repens*<br>Syn = *Elymus repens* | Quackgrass | AGRE2 / ELRE4 | N/A |
| *Agropyron smithii*<br>Syn = *Pascopyrum smithii* | Western wheatgrass | AGSM / PASM | N/A |
| *Agropyron spicatum*<br>Syn = *Pseudoroegneria spicata* ssp. *spicata* | Bluebunch wheatgrass | AGSP / PSSPs | N/A |
| *Bromus inermis* | Smooth brome | BRIN2 | N/A |
| *Carex douglasii* | Douglas's sedge | CADO2 | N/A |
| *Elymus cinereus*<br>Syn = *Leymus cinereus* | Basin wildrye | ELCI2 / LECI4 | N/A |
| *Elymus junceus*<br>Syn = *Psathyrostachys juncea* | Russian wildrye | ELJU / PSJU3 | N/A |
| *Festuca idahoensis* | Idaho fescue | FEID | N/A |
| *Koeleria cristata*<br>Syn = *Koeleria macrantha* | Prairie junegrass | KOCR / KOMA | N/A |
| *Melica bulbosa* | Oniongrass | MEBU | N/A |
| *Oryzopsis hymenoides*<br>Syn = *Achnatherum hymenoides* | Indian ricegrass | ORHY / ACHY | N/A |
| *Poa bulbosa* | Bulbous bluegrass | POBU | N/A |
| *Poa juncifolia*<br>Syn = *Poa secunda* | Sandberg bluegrass | POJU / POSE | N/A |
| *Poa sandbergii*<br>Syn = *Poa secunda* | Sandberg bluegrass | POSA12 / POSE | N/A |
| *Poa scabrella*<br>Syn = *Poa secunda* | Sandberg bluegrass | POSC / POSE | N/A |

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| Scientific Name | Common Name | Symbol | Most Likely Category* |
|---|---|---|---|
| *Sitanion hystrix*<br>Syn = *Elymus elymoides* ssp. *elymoides* | Squirreltail | SIHY /<br>ELELe | N/A |
| *Stipa comata*<br>Syn = *Hesperostipa comata* ssp. *comata* | Needle and thread | STCO4 /<br>HECOc8 | N/A |
| *Stipa occidentalis*<br>Syn = *Achnatherum occidentale* ssp. *occidentale* | Western needlegrass | STOC2 /<br>ACOCo | N/A |
| | | | |
| **SEDGES** | | | |
| *Typha spp.* | Cattail | TYPHA | N/A |
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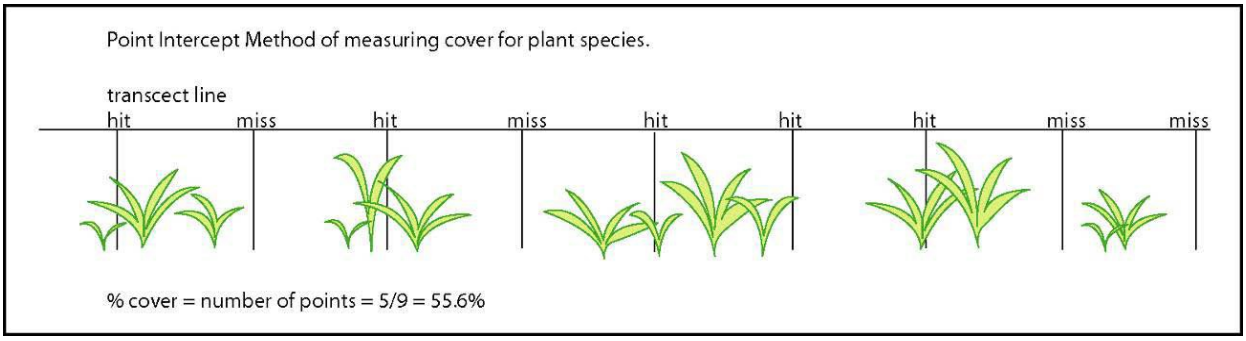


Figure III - 3. Point intercept method. Can be used to measure canopy cover and vegetation height of all grass, forb, and shrub species at a site, or canopy cover of a single lifeform (e.g., sagebrush cover for winter habitat areas).

Figure III - 4. Measuring plant species hits using point intercept technique (pin size exaggerated to emphasize method).

Figure III - 6. Measuring gaps in shrub canopy cover using line intercept method. Group sagebrush with gaps smaller than 5 cm. Record sections of sagebrush separated by greater than 5 cm as separate intercepts.

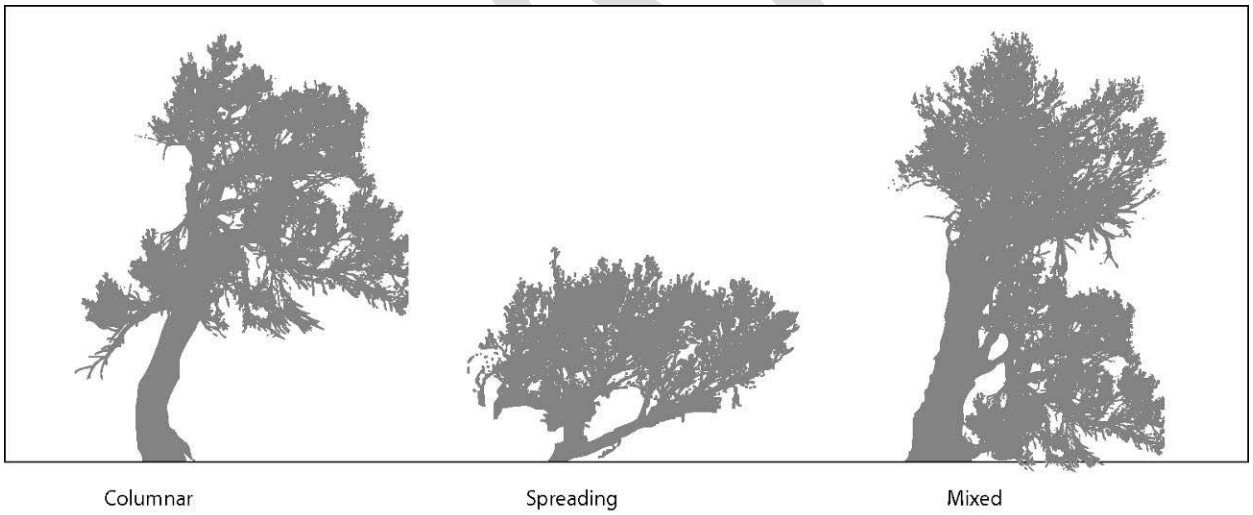


Figure III - 7. Site guide for sagebrush shapes: spreading, mixed, columnar. Sagebrush shape has an influence on herbaceous cover needs. Breeding areas with columnar-shaped sagebrush plants need more herbaceous cover for shelter needs than spreading-shaped plants.

Figure III - 8. Grass and forb height measurements. Record natural or “droop” height of grasses and forbs.

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# APPENDIX D: ODFW Lek Monitoring Procedures

## LEK/LEK COMPLEX COUNTING PROCEDURES (taken from Hagen 2011)

The following lek counting procedures are based on the premise that once lek attendance begins, a high proportion of the males that attend any given lek do so each day. Some authors have indicated that each lek should be counted at least three (Jenni and Hartzler 1978) or four (Emmons and Braun 1984) times each season at 7 to 10 day intervals between mid- March and early mid-May to reduce count variability within a given year. The highest of the three/four (lek or lek complex) counts should be used in population estimation/modeling exercises (Emmons and Braun 1984, Autenreith 1981). The following criteria should guide lek counts in Oregon:

1. Counts should be conducted between March 15 and April 30 each year. (Note: There may be local variation between districts that will dictate minor modifications to these dates).

2. Counting ideally should be done within the first 2 hours after daybreak under clear, calm, and dry weather conditions.

3. Each lek/ lek complex should be counted at least 3 times at 7 to 10 day intervals.

4. If a lek complex is counted, all leks near the complex area should be counted on the same day. Count results for each individual lek site should be kept separate for individual lek trend comparisons. Data from all leks within lek complex should be summed, and the count day with the highest count for the entire complex will be reported for population trend analysis.

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# APPENDIX E: Herbicides and Best Management Practices

A major threat to sage-grouse habitat is the loss of habitat quality and quantity due to the increase of exotic invasive plant species (noxious weeds) replacing native sagebrush plant communities.

## *Herbicide use*

Herbicide application used alone or in combination with other methods may be used where appropriate to provide a feasible and effective strategy for controlling invasive species and preparing sites for desirable sage-grouse habitat restoration. Specific herbicides anticipated for restoration and management of sage-grouse habitat or potential habitat are described in further detail below. They were chosen for maximum effectiveness against wildland weeds and least environmental and non-target species' risks.

## *Background*

The herbicide list for this CCAA includes nine herbicides that tier to the *Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS July 2010* (FEIS) and related Record of Decision dated October 1, 2010. The July 2010 Oregon FEIS tiers to the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) and related Record of Decision completed in 2007. These documents made the following herbicides available for full range of vegetation treatments in 17 western states, including Oregon.

## *Sage-grouse Consideration*

Both the *Sage Grouse Conservation Assessment* (Connelly et. al 2004) and *Ecology and Conservation of Greater Sage Grouse: A Landscape Species and Its Habitats* (USGS 2009) were reviewed and considered in preparation of the Oregon EIS. Invasive plant treatments in infested sage-grouse habitats would be part of restoration projects carefully designed to benefit sage-grouse.

## *Consistency with Labels and Laws*

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) establishes procedures for the registration, classification, and regulation of all herbicides. Before any herbicide may be sold legally, the Environmental Protection Agency (EPA) must register it. The EPA may classify an herbicide for general use if it determines that the herbicide is not likely to cause unreasonable adverse effects to applicators or the environment, or it may be classified for restricted use if the herbicide must be applied by a certified applicator and in accordance with other restrictions. The herbicide label is a legal document. Federal, State, and local law, and all herbicide label requirements will be adhered to. Herbicides may be used only for the objectives and type of vegetation for which they are registered, as displayed on the herbicide label.

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## *Best Management Practices*

The following best management practices are based on those found in *Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS* (2010) as they apply to the specific uses and herbicides identified in the CCAA and this appendix.

1. Follow all manufacturer's label requirements, restrictions, and recommendations as appropriate.
2. To minimize risks to terrestrial wildlife, use typical application rates for applications of dicamba, glyphospate, or triclopyr, where feasible.
3. Conduct a pretreatment survey. This may include, but is not limited to, flagging areas for treatment, determining what noxious or invasive species are within the area, defining the extent of area, and completing a through overview of the area before applying herbicides.
4. Apply the least amount and lowest toxicity herbicide needed to achieve the desired result.
5. Minimize the size of application area and use spot applications or low boom broadcast where possible to limit probability of contaminating non-target food and water sources, when feasible.
6. Clean off-trail vehicles (OHVs) to remove plant material and herbicide residue to minimize impact to non-target sites.
7. Set sprayers to minimize drift (e.g., with low nozzle pressure, large droplet size, low nozzle height) to the extent practical and feasible.
8. Use dyes for herbicide application to ensure complete and uniform treatment of invasive plants as well as to immediately indicate drift issues.
9. Where practical, limit glyphosphate to spot applications in grazing land and wildlife habitat areas to avoid contamination of wildlife food items.
10. Do not use adjuvant R-11.
11. Avoid using glyphosphate formulations containing POEA or seek to use formulations with the least amount of POEA (to reduce the risk to amphibians).
12. Minimize disturbance to sage-grouse populations. Do not conduct broadcast applications of herbicides during critical periods for sage-grouse are present unless the timeframe or target plant development stage is optimal for herbicide effectiveness.
13. Pay special attention to spraying at a distance away from any streams that is consistent with the label, if herbicide treatments are planned in ephemeral or perennial watercourses. If spraying near waterways additional coordination with ODFW or the Service may be necessary.

## *Herbicides*

It is also noted that during the 30-year life of this CCAA many technological changes for control of invasives with herbicides will be developed for use on rangelands and maybe applied to improve sage-grouse habitat. As such herbicides are approved by EPA and ODA for use on rangelands, they will be considered for use under this CCAA to improve sage-grouse habitat. As previously noted, this document lists nine specific herbicides; however, if other herbicides are anticipated to be applied on enrolled lands, an analysis will be conducted by the Service. This analysis will assess the risk associated with application of proposed chemicals, and if needed, additional Best Management Practice(s) will be developed (e.g., a different timing recommendation for herbicide application). For permit coverage, use of herbicides other than the

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following nine listed will require a modification consistent with Section **22. Modification of CCAA**.

## *List of Covered Herbicides*

Herbicides can be categorized as selective or nonselective. Selective herbicides kill only a specific type of plant. For example, an herbicide selective for broadleaved plants can be used to manage such species while maintaining desirable grass species in rangeland communities. Non-selective herbicides kill all types of plants, and thus should only be applied only to the target species. Herbicides can be used selectively to control specific types of vegetation (e.g., killing invasive weeds), or non-selectively to clear all vegetation on a particular area (e.g., keeping a roadway clear of vegetation). Some herbicides are post-emergent, which means they can be used to kill existing vegetation; others are pre-emergent, which stops vegetation before it grows (e.g., prohibiting seeds from germinating).

**2, 4-D**

*Product(s):* Many, including Amine, Hardball, Unison, Saber, Salvo, Aqua-Kleen, and Platoon
*Common Targets:* annual and biennial broadleaf weeds: kochia, whitetop, perennial pepperweed, Russian thistle and knapweed, sagebrush, rabbitbrush. Selective to broadleaf.
*Application:* Post-emergent
*Point of application:* foliar

**Chlorsulfuron**

*Product(s):* Telar
*Common targets:* thistles, wild carrot, giant horsetail, poison hemlock, Russian knapweed, marestail, perennial pepperweed, puncturevine, tansy ragwork, common tansy, common teasel, dalmation toadflax, yellow toadflax, whitetop, dyer's woad. Selective to broadleaf.
*Application:* Pre- and early post-emergent
*Point of application:* soil and foliar

**Diflufenzopyr + dicamba**

*Product(s):* Overdrive, Distinct
*Common targets:* knapweeds, kochia, and thistles. Selective to broadleaf.
*Application:* Post-emergent
*Point of application:* foliar

**Glyphosate**

*Product(s):* Many, including Rodeo, Mirage, Roundup Pro, and Honcho
*Common targets:* grasses (including Italian ryegrass), sedges, broadleaf weeds, and woody shrubs. Nonselective.
*Application:* Post-emergent
*Point of application:* soil or foliar

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**Imazapic**
*Product(s):* Plateau, Panoramic
*Common targets:* cheatgrass, leafy spurge, medusahead, whitetop, dalmation toadflax and Russian knapweed. Selective to some broadleaf and grasses.
*Application:* Pre- and post-emergent
*Point of application:* soil

**Metsulfuron methyl**
*Product(s):* Escort, Patriot, PureStand
*Common targets:* whitetop, perennial pepperweed, and other mustards and biennial thistles. Selective to some broadleaf and grasses.
*Application:* Post-emergent
*Point of application:* soil or foliar

**Picloram**
*Product(s):* Triumph, OutPost, Tordon
*Common targets:* perennial and woody species. Knapweeds, starthistle, thistle, bindweed, leafy spurge, rabbitbrush, rush skeletonweed, and poison oak. Selective to broadleaf and woody plants.
*Application:* Pre- and post-emergent
*Point of application:* foliar

**Sulfometuron methyl**
*Product(s):* Oust, Spyder
*Common targets:* cheatgrass, annual and perennial mustards, and medusahead. Nonselective.
*Application:* Pre- and post-emergent
*Point of application:* Soil or foliar

**Triclopyr**
*Product(s):* Garlon, Renovate, Element
*Common targets:* saltcedar, purple loosestrife, Canada thistle, tanoak, Himalayan blackberry. Selective to broadleaf and woody plants.
*Application:* Post-emergent
*Point of application:* foliar

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# APPENDIX F – Information Used to Calculate Take

## *Information used to calculate take percentages*

- **Rangeland Treatments:** When determining the level of take associated with Rangeland Treatments we used nest abandonment from livestock as a surrogate. We assumed that the types of disturbances that would occur as part of the activities described as Rangeland Treatments would have similar impacts to sage-grouse in the area being treated as those associated with repeated disturbance that cause hens to abandon their nests (see **Livestock Management** section below). We estimated that no more than 625 acres would be treated in any one year (**BCP**) and no more than 2,260 acres in a 3-year period (**MCP**) (Moore *pers. comm.* 2014). At these acreages, we also estimated that it would take 12 years (spread throughout the life of the CCAA) to reach the conservation objectives for Rangeland Treatments (see section **10.3 Juniper and Conifer Expansion**). This 12-year timeframe includes 6 years for the initial treatments and 6 additional years for any re-treatment of juniper that may be needed to meet the conservation objectives. This take estimate is likely an overestimate because of the limited availability of funding for treatments, the limited ability of the Landowners to treat more acres per year, and the low likelihood it will take 12 years of treatments to reach the conservation objectives. Additionally, as described in the conservation measures under rangeland treatments, minimization measures (timing, etc.) will be employed when treatments occur to lessen the impacts to the enrolled lands.

- **Livestock Management:** We were able to calculate levels of take associated with nest abandonment and trampling of nests from livestock grazing in occupied sage-grouse habitats. Three studies, identified nest abandonment due to disturbance from livestock grazing resulting in a total of 8 out of 223 or 3.59% of nests being abandoned (Rasmussen and Griner 1938 (n=5/161 nests research conducted in Utah), Danvir 2002 (n=2/36, research conducted in Utah), and Holloran 2003 (n=1/26 research conducted in Wyoming)). Two studies containing a total of 450 nests with five nests documented as destroyed or trampled by livestock resulting in a take percentage of 1.11%. (Rasmussen & Griner (n=2/161), Severson in progress unpublished (n=3/289)). We assumed all females (60% of the population, ODFW *pers. comm.* 2014) would be exposed to these risks on the enrolled lands. We based this assumption on the information provided in the 2011 ODFW Strategy that states 95% of nesting occurs in core habitats which is equivalent to PPH (i.e. Malheur County property), so we assumed the additional 5% of nesting occurs on lands outside core or PGH (i.e. Baker County property). Although there is no known nesting to occur on the enrolled lands, we assumed Livestock Management activities would have similar impacts to sage-grouse in the area as those associated with repeated disturbance that cause hens to abandon their nests.

- **Other Activities:** Fences are currently present throughout much of the enrolled lands and some new fences may be needed to protect sensitive areas of sage-grouse habitat or to evenly distribute livestock within the enrolled lands. Fences pose a strike risk to sage-grouse. A Utah study concluded that 18% of documented mortalities to sage-grouse were

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from fence strikes (Danvir 2002). The overall mortality rate for this population was 53%, making the relative risk of a sage-grouse hitting an unmarked fence at 9.54%. In 2011-2013, Stevens published three papers examining the relative risk of hitting fences and identifying key factors present in the habitat that would make a fence "high risk", these factors led to the development of a lek based model taking into account distance from leks, slope, roughness and other factors, Stevens concluded that if high risk fences were marked with anti-strike markers or reflectors it would reduce mortalities by 83%, which would reduce overall fence strike mortality rate down to 1.62%. For our calculations we assumed 100% of all birds in the enrolled lands would be exposed to fence strikes annually, we also assumed all high risk fences will be marked as part of this CCAA.

There may be additional take associated with both the direct and indirect aspects of rangeland management, however there have been very few cause and effect studies quantifying this. (Rowland 2004). We are providing an allowance of up to 0.5% as a result of these types of activities across all covered lands and affecting all birds.

**Examples might include:**

- Striking a sage-grouse with a vehicle while landowners or their agents are performing covered activities, implementing conservation measures or recreating.
- Drowning in stock tanks fitted with escape ramps.

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