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Implementing the Candidate Conservation Agreement for Greater Sage-Grouse on the Idaho National Laboratory Site: 2023 Summary Report

January 2024

Implementing the Candidate Conservation Agreement for Greater Sage-Grouse on the Idaho National Laboratory Site

2023 Summary Report

January 2024

**Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office**

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ACRONYMS

BEA	Battelle Energy Alliance
BIL	Bipartisan Infrastructure Law
BLM	Bureau of Land Management
CCA	Candidate Conservation Agreement
CFA	Central Facilities Area
DOE-ID	U. S. Department of Energy–Idaho Operations Office
EA	Environmental Assessment
EC	Environmental Checklist
ECP	Environmental Compliance Permit
F&SS	Facilities and Site Services
IDFG	Idaho Department of Fish and Game
INL	Idaho National Laboratory
MPLS	Males Per Lek Surveyed
NAIP	National Agriculture Imagery Program
NRF	Naval Reactors Facility
NRG	Natural Resources Group
NSTR	National Security Test Range
SGCA	Sage-grouse Conservation Area
UAS	Unmanned Aerial Systems
USFWS	U.S. Fish and Wildlife Service

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1. INTRODUCTION

In October 2014, the U.S. Department of Energy Idaho Operations Office (DOE-ID) and the U.S. Fish and Wildlife Service (USFWS) entered into a Candidate Conservation Agreement (CCA) for greater sage-grouse (*Centrocercus urophasianus*; hereafter sage-grouse) on the Idaho National Laboratory (INL) Site (DOE-ID and USFWS 2014). The CCA stipulates that DOE-ID submits a report annually to USFWS documenting monitoring and conservation activities that occurred within the preceding twelve months. The current Summary Report satisfies this reporting requirement by highlighting key findings of a comprehensive report (INL 2024) produced by the Battelle Energy Alliance (BEA) Natural Resources Group (NRG). Comprehensive reports (called Full CCA Reports) for each year can be found under the heading *Candidate Conservation Agreement* at <https://inl.gov/environmental-publications/#conservationplanning>.

Key findings from 2023 that are summarized in the current report include: (1) a concise description of results from all CCA monitoring tasks performed by the NRG, and (2) actions taken by DOE-ID, INL contractors, and other stakeholders to meet the objectives of conservation measures designed to reduce threats to sage-grouse and its habitats (DOE-ID and USFWS 2014). Most importantly, this Summary Report updates stakeholders regarding sage-grouse population and habitat trends as applied to adaptive regulatory triggers established in the CCA. The two triggers and criteria that define them are:

Population Trigger: The three-year running average of peak male attendance, summed across 27 leks within the Sage-grouse Conservation Area (SGCA). This trigger will trip if the average falls below 253 males—a 20% decrease from the 2011 baseline of 316 males.

Habitat Trigger: Total area designated as sagebrush habitat within the SGCA. This trigger will trip if total area falls below 57,840 ha (142,925 acres)—a 20% drop from the updated 2019 baseline of 72,300 ha (178,656 acres; see Section 3.2).

Reports of related monitoring tasks described in Section 11.1 of the CCA (DOE-ID and USFWS 2014) are grouped into three sections: Population Monitoring (Section 2), Habitat Monitoring (Section 3), and Threat Monitoring (Section 4). Section 5 summarizes how DOE-ID, contractors, and other stakeholders implemented conservation measures listed in the CCA during the past year. The final section (Section 6) synthesizes results from all monitoring tasks and discusses results and their implications in the context of regional trends and future management directions. This section also documents changes and updates to the CCA that have been approved by both signatories during the past year.

This report informs a continuing dialogue between DOE-ID and USFWS as the two agencies cooperate to achieve CCA objectives for sage-grouse conservation on the INL Site. Consistent re-evaluation and analysis of new information ensures that the CCA continues to benefit sage-grouse on the INL Site, is grounded in the best available science, and retains its value to both signatories.

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2. POPULATION MONITORING

2.1 Task 1—Lek Counts and Lek Route Surveys

Summary of Key Results: Total male sage-grouse counted on baseline leks was 23.6% higher than in 2022 (304 males). This resulted in an increase of the three-year running average to 259 males, which exceeded the population trigger threshold. Counts on six lek routes increased 13.5% over 2022. Three leks were downgraded to inactive status and one was reclassified as active, reducing the total number of known active leks on the INL Site to 34.

2.1.1 Introduction

The primary purposes of the sage-grouse monitoring task are to track the status of the population trigger and to monitor long-term trends of male attendance on INL Site leks. The basis of the population trigger is the three-year average male count on 27 designated leks within the SGCA (DOE-ID and USFWS 2014; hereafter baseline leks). Each year, baseline leks, lek routes, and all other active leks on the INL Site are surveyed ≥ 3 times from mid-March to early May (Figure 2-1). Additionally, a few inactive leks are selected each year that are not included in annual surveys. These are visited ≥ 2 times each to verify they remain unoccupied. The latter exercise helps BEA maintain accurate records of the number and location of active leks on the INL Site.

2.1.2 Results and Discussion

The spring of 2023 presented challenges for field crews tasked with data collection. Above normal winter/spring precipitation and snow accumulation delayed access to some lek routes by as many as five weeks when compared to prior years. As a result, field crews prioritized surveys of baseline leks, as they are the primary metric for the population trigger.

SGCA Baseline Leks

Summed peak attendance across baseline leks in 2023 was 304 males—58 (23.6%) more than in 2022 (Figure 2-2). This value is higher than the previous three years but remains equal to or lower than any other year since 2011—the basis year for the population trigger. In total, 17 baseline leks were classified as active at the end of the 2023 field season, which is unchanged from the previous year.

The three-year (2021–2023) running average of peak male attendance on baseline leks increased 11.2% to 259 males (SD = 40.1), exceeding the population trigger threshold of 253 males. This was the first year since 2018 that the three-year average has increased (Figure 2-2).

Lek Routes

The sum of peak male attendance across all routes increased in 2023 to 312 males (13.5%) with a males-per-lek-surveyed (MPLS) value of 8.2. Individually, MPLS increased on three routes when compared to 2022; the Radioactive Waste Management Complex route had the largest increase (63.1%) (Table 2-1). The Frenchmans Cabin¹ and T-9 routes also had increases in MPLS when compared to 2022, with the T-9 route having the highest MPLS since it was established in 2017. The remaining three lek routes—Tractor Flats, T-3, and Lower Birch Creek—decreased in MPLS in 2023 when compared to 2022 with Lower Birch Creek having the largest decline of 12%. Both Tractor Flats and T-3 MPLS values declined 5.8% and 9.1%, respectively.

¹ “Frenchmans Cabin” is a recognized map feature by the U.S. Board on Geographic Names and is not misspelled.

Table 2-1. Lek route data from 2023 surveys on the Idaho National Laboratory Site and multi-year means for each route.

Lek Route	2023 Peak Count	Multi-Year Mean* (Range; SD)	Leks Surveyed	Males per Lek Surveyed (MPLS)	MPLS % Change from 2022	Occupied Leks [†]	Surveys Performed
Tractor Flats	55	67.8 (51–115; 19.7)	8	6.9	–5.8	4	3
Radioactive Waste Management Complex	91	88.7 (28–141; 37.1)	9	10.1	63.1	5	4
Lower Birch Creek	44	80.8 (29–133; 34.8)	10	4.4	–12	5	3
West T-3	32	30.8 (16–49; 14.9)	4	8	–9.1	3	4
T-9	55	37.5 (31–48; 5.9)	4	13.8	14.6	2	5
Frenchmans Cabin	35	30.2 (15–46; 10.3)	3	11.7	25.4	2	3
Total	312		38			21	22
Mean				8.2	14.0		

*For the first three routes, the 10-year mean (2013–2022) is displayed; for the last three, it is a 6-year mean (2017–2022).

[†] Leks on routes are considered occupied if two or more males were observed displaying during the current year’s survey. This is different from an active lek designation that the Natural Resources Group uses to characterize leks on the Idaho National Laboratory Site, which is based on five years of data. Here, we report the number of leks occupied on the day the route count peaked.

Other Surveys and Changes of Lek Status

Based on results from routine surveys, two non-baseline leks, INL 10 and INL 54, and one baseline lek, INL 35 were changed to an inactive status, and one baseline lek, INL 1, was changed to active status following the 2023 field season. In addition to routine surveys of active and inactive baseline and route leks, seven inactive leks were visited twice each to verify status (INL 2024). No sage-grouse were

observed at any of these leks, so each will retain its inactive status and will be visited again in five years or less.

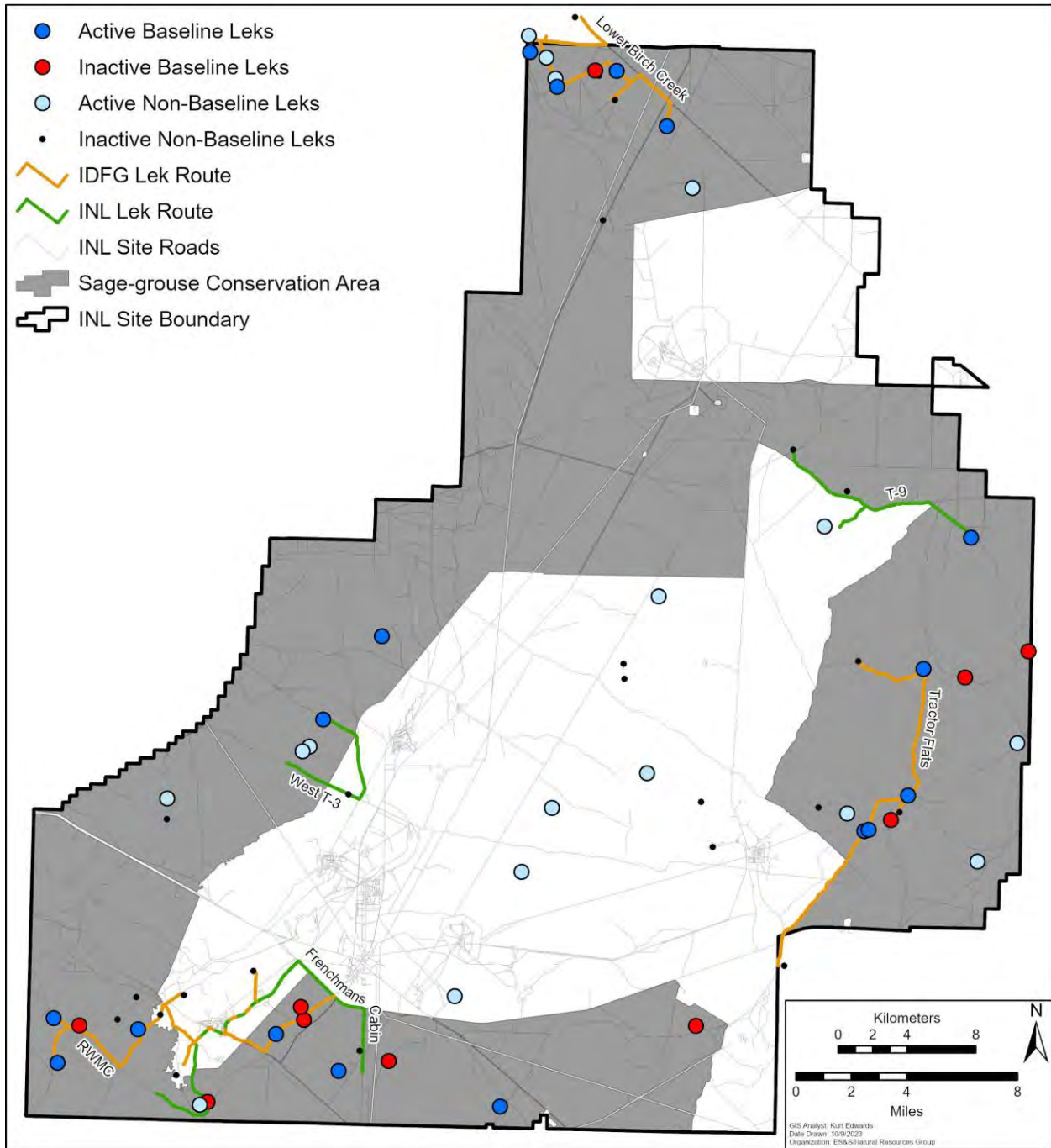


Figure 2-1. Sage-grouse leks surveyed on the Idaho National Laboratory Site in 2023. Lek activity designations (active vs. inactive) refer to lek status at the end of 2023. Inactive non-baseline leks include inactive leks assigned to lek routes (visited annually) and a subset of other inactive leks visited once every five years (rotational leks).

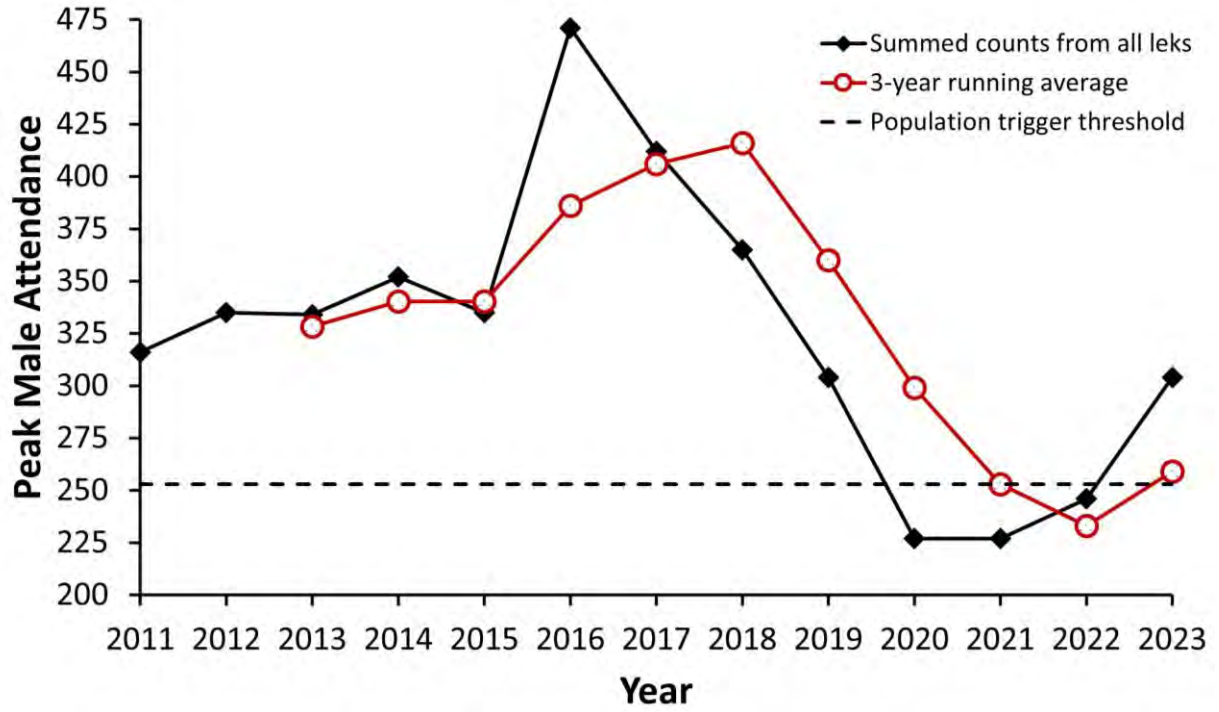


Figure 2-2. Peak male attendance of greater sage-grouse at baseline leks in the Sage-grouse Conservation Area. Black squares represent the annual sum of peak male attendance on all baseline leks.

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3. HABITAT MONITORING

Areas designated as sagebrush habitat will change over time based on gradual changes in vegetation composition and abrupt changes caused by disturbances like wildland fire. To facilitate annual evaluation of the habitat trigger, two monitoring tasks are used to identify vegetation changes across the landscape and to assist in maintaining an accurate record of the condition and distribution of sagebrush habitat within the SGCA.

3.1 Task 5—Sagebrush Habitat Condition Trends

Summary of Results: In 2023, sagebrush habitat condition summary metrics were within or above the five-year baseline. Sagebrush habitat plot trend analyses indicate that sagebrush cover has increased over the past eleven years of monitoring, intact sagebrush habitat communities are resistant to introduced species dominance, and native perennial functional groups are exhibiting resilience to change. Post-fire communities remain largely dominated by native perennial species, but they exhibit greater annual fluctuation in species abundance and composition.

3.1.1 Introduction

This section of the Summary Report summarizes annual assessments from permanent vegetation monitoring plots that were established to evaluate the condition of sagebrush habitat available to sage-grouse across the INL Site. Data from vegetation plots in areas designated as sagebrush habitat (hereafter sagebrush habitat plots) are sampled annually and are used to characterize habitat condition with respect to vegetation cover, vegetation height, and sagebrush density. Vegetation cover is the amount of ground covered by vascular plant species and it is used to estimate abundance and composition, which is important for evaluating the health or ecological condition of habitat. The height of vegetation is the vertical structure and associated visual cover of plant and is used to characterize shelter available to sage-grouse. Sagebrush density and juvenile frequency are used to infer the growth or decline of the sagebrush populations.

In addition to intact sagebrush habitat, it is also important to understand the condition of habitats in areas where sagebrush has been lost to wildland fire or other disturbances to better inform land stewardship strategies that facilitate recovery to healthy and productive sagebrush habitat. There are additional vegetation monitoring plots (hereafter non-sagebrush plots) within wildland fire footprints and separate analyses are conducted to evaluate the recovery status of non-sagebrush areas.

Results are summarized by plant functional groups, which are basic assemblages of plant species based on shared life histories and then divided by their nativity. For sagebrush habitat plots, annual habitat condition metrics are compared to baseline values. Baseline values were calculated from annual vegetation monitoring plots over five consecutive years for vascular cover, shrub and herbaceous height, sagebrush density, and sagebrush juvenile frequency (Shurtliff et al. 2019). Trends in habitat condition are discussed for both habitat and non-sagebrush plots over the span of the monitoring effort. Precipitation data are also summarized to provide a contextual background to habitat condition trend patterns over longer time frames.

3.1.2 Results and Discussion

Annual Habitat Condition Overview

Overall, the condition of sagebrush habitat in 2023 remains high as these areas continue to be dominated by a woody sagebrush overstory with a native herbaceous grass/forb understory (Table 3-1, Table 3-2, INL 2024). In 2023, sagebrush cover and height were greater than baseline and near the upper end of the range of variability for this dataset. Perennial grass/forb cover and height was also greater than the

baseline but was within the historical range of variability in 2023. Sagebrush density was well below the baseline and this result is likely due to low 2023 juvenile sagebrush frequency (INL 2024).

Table 3-1. Summary of vegetation measurements used to characterize the condition of sagebrush habitat on permanent monitoring plots ($n = 43^*$) on the Idaho National Laboratory Site in 2023.

2023 Summary			
Sagebrush Habitat Plots	Mean Cover (%)	Mean Height (cm)	Mean Density (individuals/m ²)
Sagebrush	24.58	51.38	2.29
Perennial Grass/Forb	14.58	28.94	—

*indicates sample size difference from baseline summary.

Table 3-2. Five-year averages of vegetation measurements used to establish baseline values for characterization of sagebrush habitat condition on permanent plots ($n = 48$) on the Idaho National Laboratory Site. Baseline values were generated from vegetation monitoring plot data from 2013–2017. The Standard Error of the mean is denoted by SE.

Baseline Summary						
Sagebrush Habitat Plots	Mean Cover (%)	SE	Mean Height (cm)	SE	Mean Density (individuals/m ²)	SE
Sagebrush	21.27	±0.33	47.81	±0.98	5.19	±1.80
Perennial Grass/Forb	9.99	±2.53	20.70	±3.67	—	—

Habitat Condition Trend Analyses

Trend analysis from sagebrush habitat plots and non-sagebrush plots are used to understand the quality of habitats available to sage-grouse over time. From plots that represent intact sagebrush habitat, cover from sagebrush species is trending upward (Figures 3-1 and 3-2) and cover from the most recent sample periods is significantly greater than cover from the earliest sample periods (INL 2024). The native perennial graminoids functional group and the annual and biennial forb functional group lack clear directional trends but sample periods with higher cover correspond with more favorable annual precipitation events (Figure 3-3). Introduced annuals, including cheatgrass (*Bromus tectorum*), are common throughout intact sagebrush habitats but are a minor component of the plant community. Introduced annual functional groups are not trending directionally and native functional groups continue to be far more abundant than introduced functional groups, overall.

While sagebrush cover is expected to be low in burned plant communities, there are small remnant stands of unburned sagebrush as well as individuals from post-fire reestablishment. In 2023, sagebrush cover within the non-sagebrush plots was less than 2%, but it is significantly greater when compared to earlier sample periods which may indicate the early signs of habitat recovery. Post-fire plant communities continue to be dominated by native perennial grasses and resprouting shrubs. When compared to adjacent sagebrush habitat plots, introduced functional groups in non-sagebrush plots exhibit amplified cover fluctuations suggesting these areas are more susceptible to introduced species dominance. For this reason, it is important to conserve intact sagebrush habitats that are resistant to introduced species dominance and to manage recovering habitats so that they continue to remain resilient, with a diverse and abundant perennial plant community.

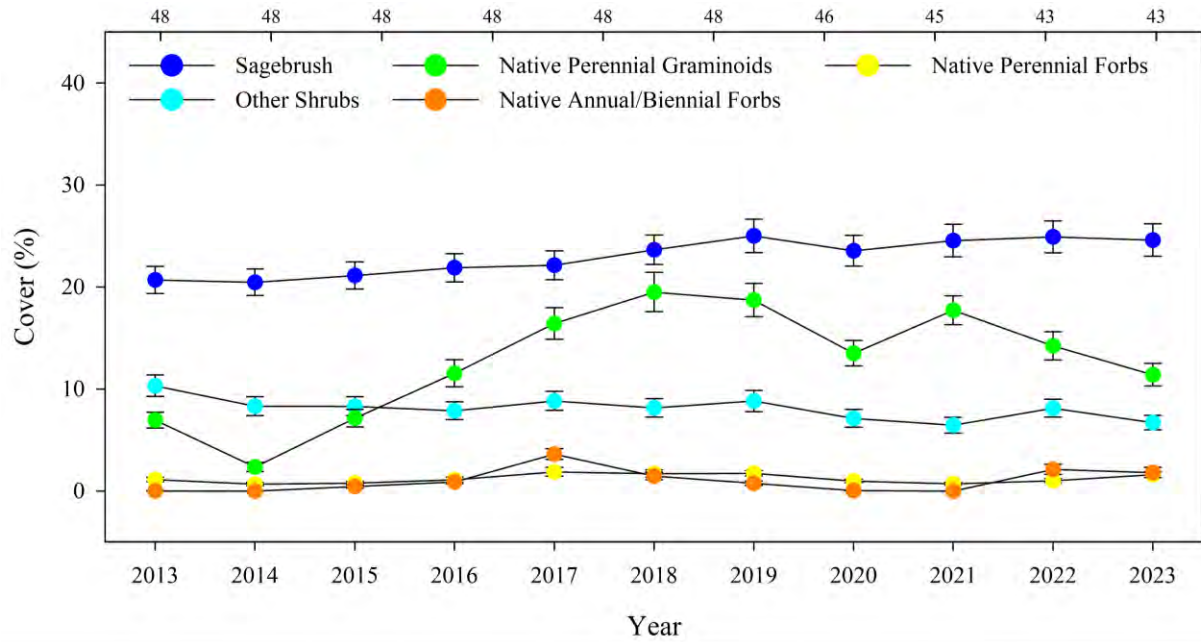


Figure 3-1. Sagebrush habitat plot cover by native functional groups on the Idaho National Laboratory Site from 2013 through 2023. Error bars represent ± 1 standard error. Sample size is denoted along the top at corresponding tick marks.

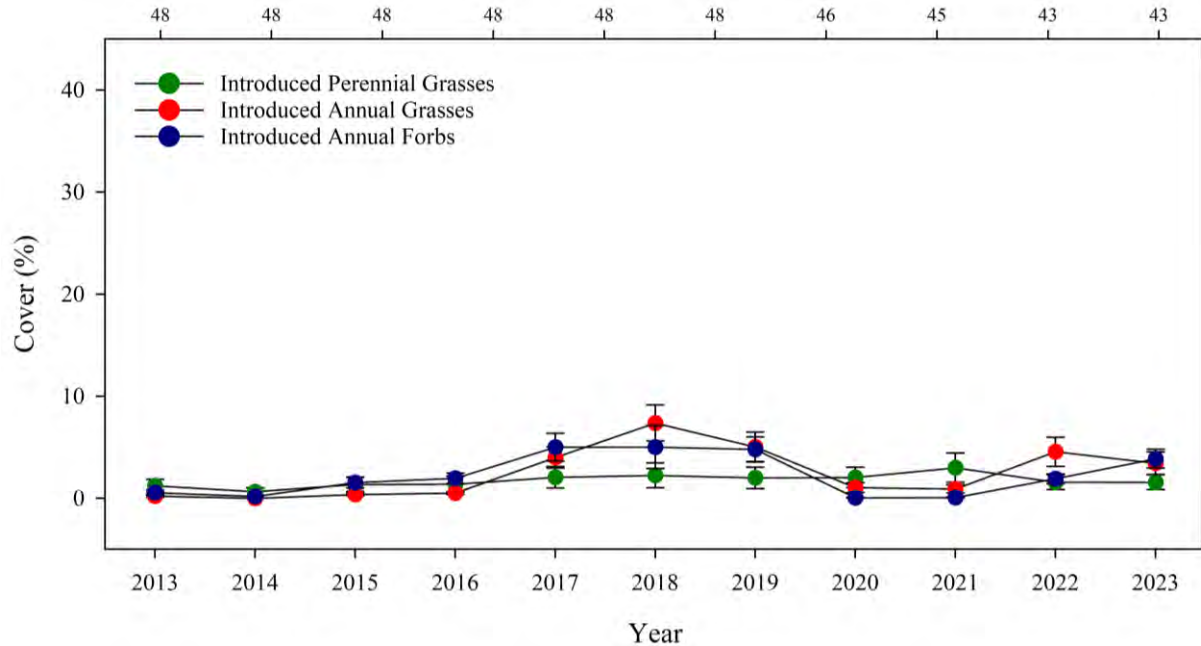


Figure 3-2. Sagebrush habitat plot cover by introduced functional groups on the Idaho National Laboratory Site from 2013 through 2023. Error bars represent ± 1 standard error. Sample size is denoted along the top at corresponding tick marks.

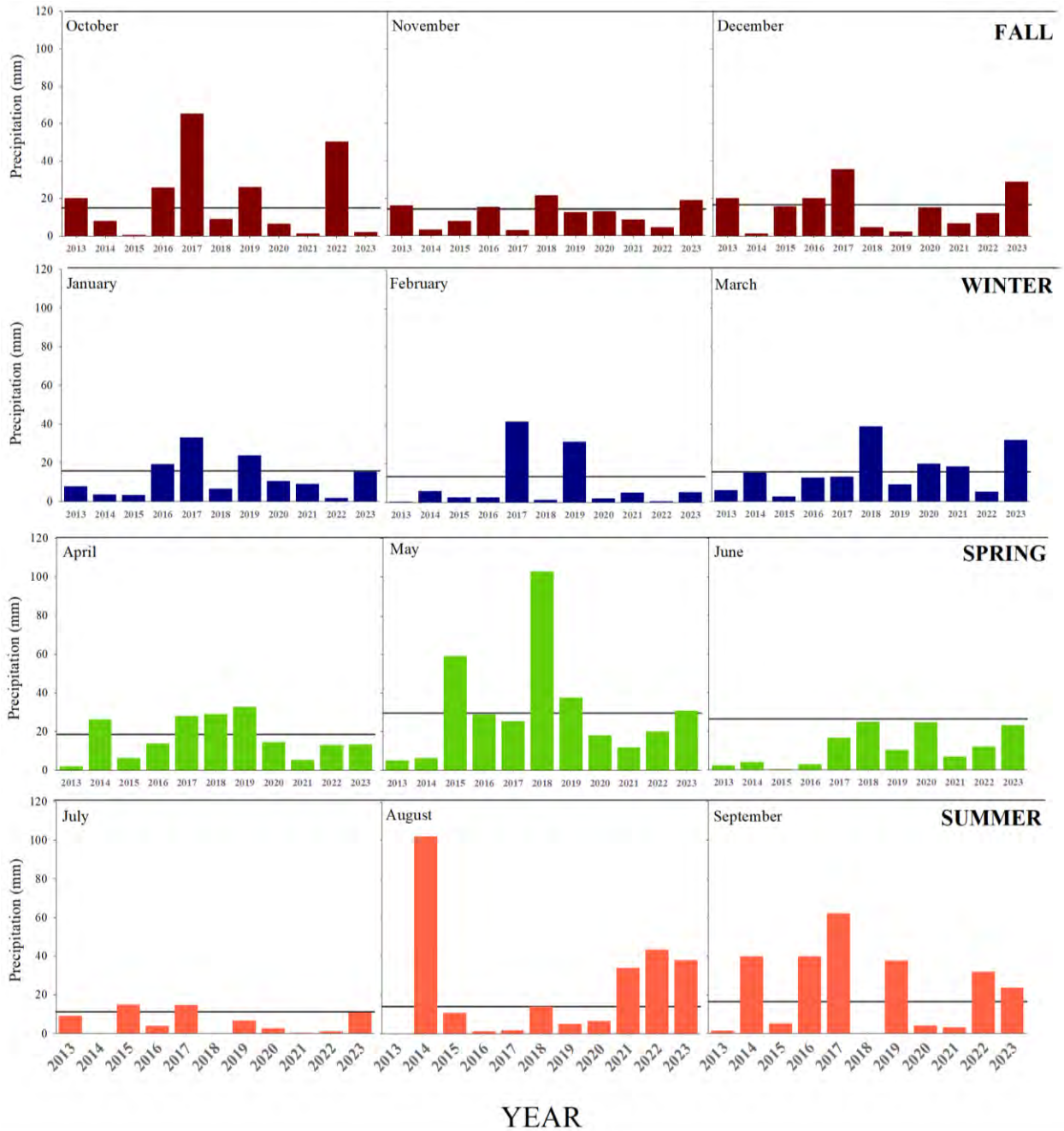


Figure 3-3. Monthly precipitation totals, organized by water-year (October 1–September 30), for the past ten years. Means are depicted with a solid line and were calculated from precipitation data collected between 1951 to 2023. Data are from the Central Facilities Area on the Idaho National Laboratory Site and were provided by the National Oceanic and Atmospheric Administration.

3.2 Task 6—Monitoring to Determine Changes in Sagebrush Habitat Amount and Distribution

Summary of Results: There were two small wildland fires on the INL Site in 2023 that burned approximately 5.5 ha (13.8 acres). The total area of sagebrush habitat in the SGCA on the INL Site remains unchanged from 2022 at 71,358.8 ha (176,331.4 acres) representing a 1.3% decrease from the updated sagebrush habitat baseline. The current estimated area of sagebrush habitat remaining outside the SGCA is 28,306.5 ha (69,947 acres).

3.2.1 Introduction

This task is intended to provide an update to the current sagebrush habitat distribution map, and primarily addresses losses to sagebrush habitat following events that alter vegetation communities. As updates are made to map classes (i.e., vegetation polygon boundaries are changed), the total area of sagebrush habitat mapped will be compared to the baseline value established for the habitat trigger to determine status with respect to the trigger threshold.

3.2.2 Results and Discussion

There were two small fires that occurred on the INL Site in 2023. On July 9, the Howe Junction Fire occurred near mile marker 259 along U.S. Highway 20/26 and burned 1.3 ha (3.3 acres). On July 10, the Underpass Fire started on U.S. Highway 20/26 near mile marker 271 and burned approximately 4.2 ha (10.5 acres).

The two 2023 wildland fires did not meet the size criteria for conducting post-fire mapping, and there was no work performed on the Infrastructure Expansion task in 2023 (Section 4.2). Therefore, the total area of sagebrush habitat in the SGCA on the INL Site remains unchanged from 2022 at 71,358.8 ha (176,331.4 acres; Figure 3-4). The sagebrush habitat outside of the SGCA is considered a ‘conservation bank’ that could be incorporated into the SGCA to replace lost sagebrush habitat resulting from wildland fire or new infrastructure development (DOE-ID and USFWS 2014). The current estimated area of sagebrush habitat outside the SGCA also remains unchanged with 28,306.5 ha (69,947 acres).

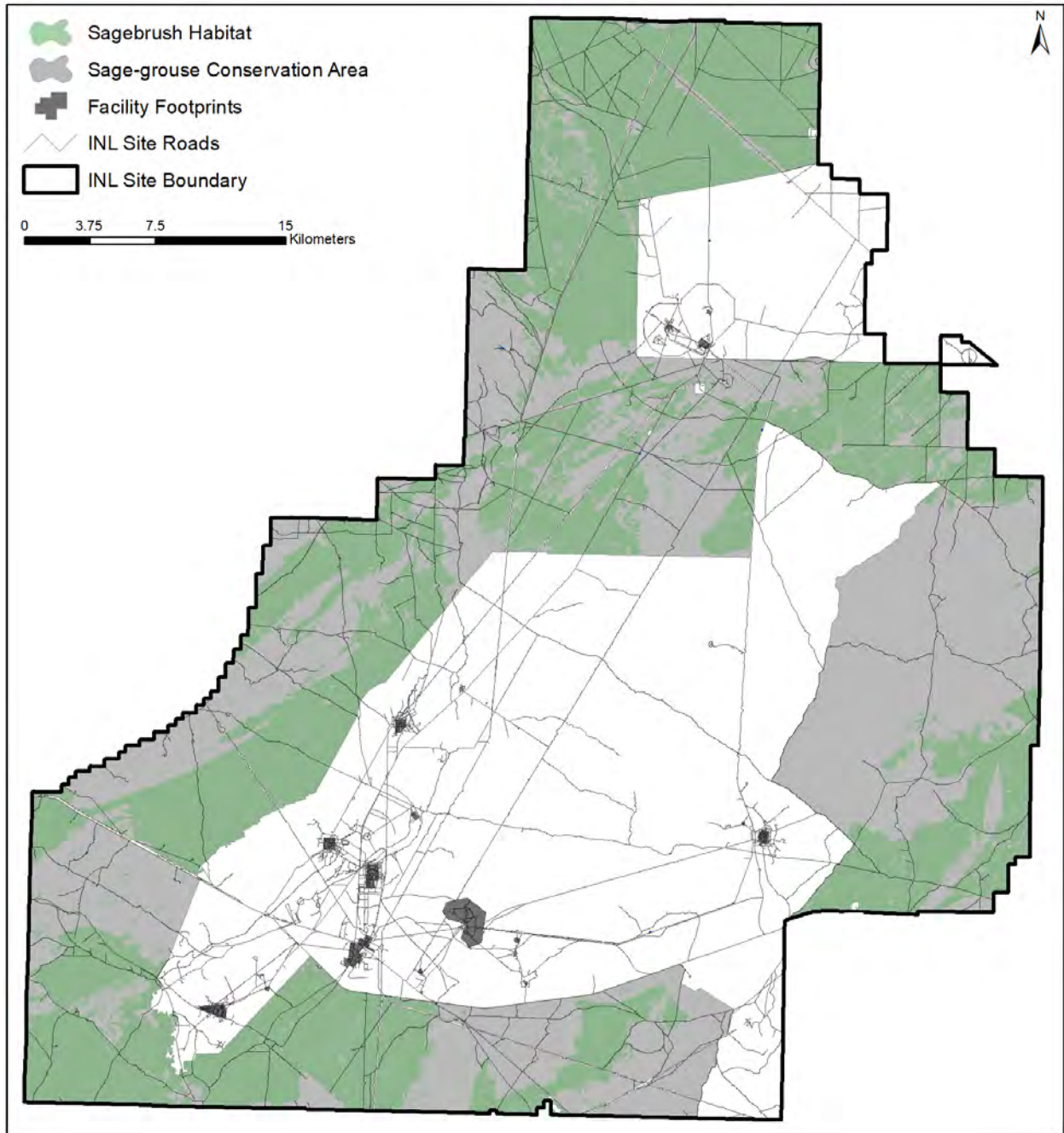


Figure 3-4. Current sagebrush habitat distribution within the Sage-grouse Conservation Area on the Idaho National Laboratory Site.

4. THREAT MONITORING

Threats that potentially impact sage-grouse and its habitats on the INL Site require regular monitoring to track the status of the threat and establish baseline evidence so success of implemented conservation actions can be evaluated. Monitored threats include raven predation (Section 4.1), infrastructure development (Section 4.2), wildland fire (Section 4.3), and livestock (Section 4.3). Annual grasslands (i.e., cheatgrass) trends are discussed above (Section 3.1), and cheatgrass control, which is a component of post-fire restoration, is addressed in Section 5.2.1.

4.1 Task 4—Address Raven Predation

Summary of Results: Several actions were taken to deter raven nesting temporarily and permanently in 2023. Nests were removed near the Central Facilities Area and Experimental Breeder Reactor I, but results from past nest removal suggest these actions may have merely delayed, not deterred nesting. In 2025, a building at Naval Reactors Facility that has commonly supported raven nesting will be demolished. Wooden crossarms on eight power transmission structures were replaced with single-sided metal crossarms, rendering them unusable for nesting.

4.1.1 Introduction

The purpose of this section is to report on actions taken during 2023 to reduce or deter raven nesting on the INL Site, with special emphasis on actions taken within or near raven nesting hot spots. In 2022, an analysis was performed that identified raven nesting hot spots on INL Site infrastructure based on an eight-year annual nest survey (INL 2023). The analysis produced a prioritized list of facilities, power lines sections, and towers where installation of nest deterrents was recommended. The primary criteria used in the analysis was proximity of nesting hot spots to active sage-grouse leks and potential sage-grouse nesting habitat.

The analysis identified 33 hot spots, the highest priority of which was at the Experimental Breeder Reactor I (EBR-I). Medium-priority hot spots on government-controlled infrastructure included the Naval Reactors Facility (NRF), Advanced Mixed Waste Treatment Project, the Central Facilities Area (CFA) main gate, two sections of transmission lines southeast of the Specific Manufacturing Capability facility (Hot Spots 19 and 20), and a power line section northeast of NRF (Hot Spot 7; Figure 4-1).

4.1.2 Activities to Reduce or Deter Raven Nesting

EBR-I (High Priority)—Raven nesting has historically occurred on the two aircraft engines on display at the EBR-I museum. Nesting on these structures is difficult to manage because engines are in a radiation control area where access is restricted to qualified individuals, and because the engines provide numerous potential nesting sites. Facility personnel cleaned nesting materials off the engines during the springs of 2022 and 2023. Although follow-up nest monitoring did not occur in either year, the fact that nesting materials were again present in 2023 indicates that merely clearing nesting materials off the substrates is not an effective way to deter raven nesting.

Retrofits of Electrical Power Transmission Lines—BEA Power Management replaced wooden double crossarms with narrow, single-side metal crossarms on eight transmission structures between NRF and Test Area North in 2023. Although structures were selected based on maintenance priority, one structure was only 400 m northeast of Hot Spot 7—a medium-priority hot spot (Figure 4-1). With that retrofit complete, the three structures immediately northeast of Hot Spot 7 are all retrofitted, and 10 of 14 structures along a 2.6-km stretch of line that includes Hot Spot 7 are now retrofitted.

NRF (Medium Priority)—During the past decade, ravens have frequently nested on substrates attached to a particular building at NRF. This building is scheduled to be demolished in 2025.

CFA Main Gate (Medium Priority)—A nest was built in the spring of 2023 on a moveable ladder under a lean-to structure behind the badging station at Gate 1. After ensuring no eggs were in the nest, it was removed. In the past, ravens primarily built nests under the eaves of this lean-to, and Facilities and Site Services (F&SS) staff intend to install deterrents under the eaves in 2024.

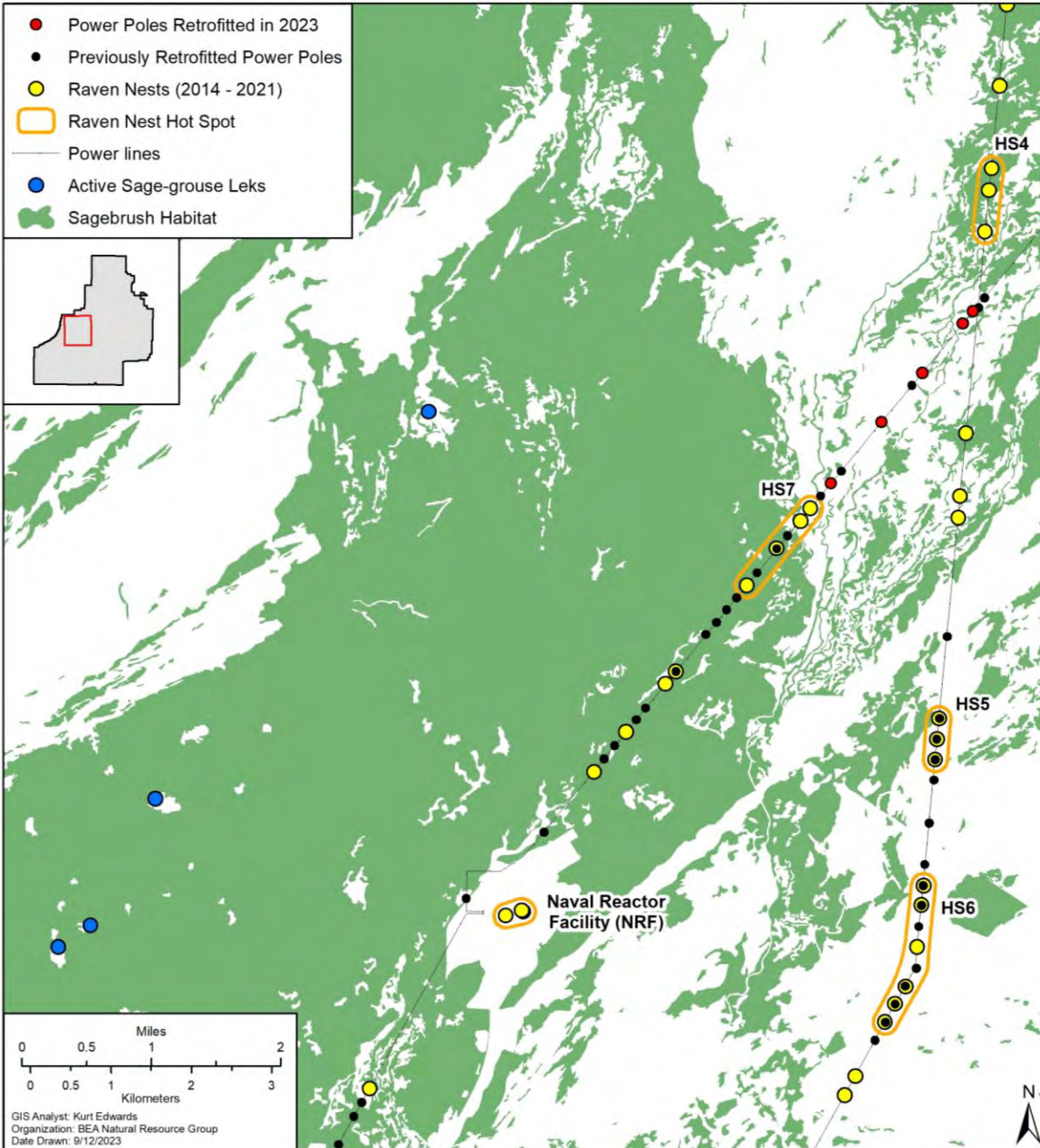


Figure 4-1. Locations of previously documented raven nests and retrofitted power line structures relative to active sage-grouse leks and sagebrush-dominated plant communities on the west side of the Idaho National Laboratory Site.

4.2 Task 8—Monitor Expansion of the Infrastructure Footprint within the SGCA and Other Areas Dominated by Big Sagebrush

Summary of Results: There was no work conducted on this task in 2023 because no new high-resolution imagery was available for the INL Site prior to reporting.

4.2.1 Introduction

The goal of this monitoring task is to identify where expansion of infrastructure has occurred and document and map all two-track linear features within the SGCA and other areas dominated by big sagebrush. This task serves as the mechanism to identify and report on new infrastructure and two-track linear features being developed and to update the sagebrush habitat distribution data layer due to changes across the landscape not associated with wildland fires. Infrastructure development is considered a medium-ranked threat to sage-grouse on the INL Site. Infrastructure expansion on the INL Site occurs when facility or project footprints encroach into adjacent patches of sagebrush habitat or when new two-track linear features are created in otherwise undisturbed areas. Losses in sagebrush habitat documented under this monitoring task are included in habitat distribution task totals to evaluate the status of the habitat trigger.

This monitoring task is conducted whenever new high-resolution imagery that encompasses the entire INL Site becomes available. Currently, this is reliant on the U.S. Department of Agriculture National Agriculture Imagery Program (NAIP), which typically collects aerial digital imagery in Idaho every two years and is made publicly available at no cost. As other high-resolution imagery becomes available (e.g., INL Site image acquisition following a large wildland fire), those data are also incorporated into the analysis to monitor infrastructure changes.

4.2.2 Results and Discussion

There was no work conducted on this task in 2023 because no new high-resolution imagery was available for the INL Site prior to reporting. The U.S. Department of Agriculture NAIP collected high resolution imagery across the State of Idaho during the summer of 2023 and those data are typically made available the following spring or early summer. Once we download and process the new 2023 NAIP imagery, the INL Site will be systematically reviewed for expansion of linear features and losses of sagebrush habitat due to facility or project footprint expansions, and those results will be presented in 2024.

4.3 Task 5—Assessment of Potential Threats to Sagebrush Habitat

Summary of Results: Data were collected for a subset of 50 habitat monitoring plots in 2023. Results of analyses evaluating the potential impacts of wildland fire and livestock operations on habitat condition will be presented in the 2026 CCA Implementation Reports, after the third sample period data have been collected.

4.3.1 Introduction

This section of the Summary Report addresses the evaluation of two habitat-related threats to sage-grouse populations as identified in the CCA (DOE-ID and USFWS 2014). The potential effects to sagebrush habitat from wildland fire, a threat ranked as “high” and from livestock operations, a threat ranked as “low,” are assessed once every five years. Habitat characteristics are summarized for each wildland fire footprint and for each livestock allotment with enough area inside the INL Site boundary to allow for meaningful analysis. Habitat summaries from habitat monitoring plots located within wildland fire footprints are compared to plots that have not been affected by wildland fire according INL wildland fire records, and summaries from plots located within livestock grazing allotments are compared to plots located outside of allotments.

There are 150 habitat condition plots sampled on a rotational basis (hereafter rotational plots) to increase sample sizes within wildland fire footprints and livestock allotments. The rotational plots are divided into three subsets of 50 plots. The annual habitat condition monitoring plots—see section 3.1—collected in the same year as the Rotation Plots Set III are included within the assessment of potential threats to sagebrush habitat. A sampling period requires the span of three years to complete and results of data analyses are reported in CCA Implementation Reports the year after (Table 4.1).

Habitat condition is assessed by summarizing and comparing cover by functional group, height by functional group, and sagebrush density. Generalized linear models, like ANOVAs, are used to compare habitat condition summaries between individual wildland fire footprints and unburned areas and between livestock grazing allotments and areas outside of grazing allotments, as well as changes in functional groups over time.

Table 4-1. Habitat condition monitoring schedule to conduct vegetation sampling and report results for the third sample period to be completed since sampling began in 2013.

Assessment of Potential Threats to Sagebrush Habitats Schedule		
Year	Vegetation Plot Sampling Efforts	Reporting Efforts
2023	Annual Plots + Rotational Plots Set I	Sagebrush Habitat Condition Trends
2024	Annual Plots + Rotational Plots Set II	Sagebrush Habitat Condition Trends
2025	Annual Plots + Rotational Plots Set III	Sagebrush Habitat Condition Trends
2026	Annual Plots	Sagebrush Habitat Condition Trends + Evaluation of Potential Threats on Habitat Condition
2027	Annual Plots	Sagebrush Habitat Condition Trends

4.3.2 Results and Discussion

In 2023, sampling was completed for 50 rotational habitat plots from Rotational Set I. Once vegetation monitoring data has been collected for the third sample period, from 2023 to 2025, we will conduct analyses evaluating the potential impact of wildland fire and livestock operations threats to habitat condition and those results will be presented in the 2026 CCA Implementation Reports.

5. IMPLEMENTATION OF CONSERVATION MEASURES

5.1 Summary of 2023 Implementation Progress

The CCA describes eight threats and 13 conservation measures designed to mitigate and reduce those threats to sage-grouse and its habitats on the INL Site. It also articulates DOE-ID's requirement that infrastructure development results in no net loss of sagebrush. The following list highlights activities and accomplishments associated with conservation measures that DOE-ID, contractors, and stakeholders participated in and achieved in 2023 to reduce threats. Minor activities and conservation measures that have been discontinued or were not actively implemented during the past year are not listed. For a full description of all activities cited below, see Appendix A.

5.1.1 Threat: Wildland Fire

Conservation Measure 1—Prepare an assessment for the need to restore the burned area. Based on the assessment, DOE-ID would evaluate and prioritize treatment options to meet habitat recovery objectives in burned areas and reduce the impact of wildland fires >40 ha (99 acres). Primary habitat recovery objectives include soil stabilization, cheatgrass and noxious weed control, maintaining a healthy herbaceous understory, and sagebrush restoration.

- Two fires occurred on the INL Site that burned approximately 5.6 ha (14 acres). Because they were below the minimum size, neither fire warranted an assessment for the need to restore the burned areas.

Associated activities to reduce the wildland fire threat:

- The INL Fire Department and NRG are updating and developing plans to increase the efficacy of fuels management, fire suppression, and recovery actions. The National Environmental Policy Act group is preparing to complete an Environmental Assessment (EA) evaluating the potential impacts of these plans.
- BEA mowed 6- to 12-m (20- to 40-ft) firebreaks along 190 km (118 mi) of roads.
- NRG facilitated the planting of 74,850 seedlings within the 2010 Middle Butte Fire and 2007 Twin Butte Fire to support habitat restoration efforts.

5.1.2 Threat: Infrastructure Development

Conservation Measure 2—Adopt Best Management Practices outside facility footprints for new infrastructure.

- Five infrastructure projects minimized the total distance of habitat edge caused by construction and project activities in 2023.
- Five projects co-located new infrastructure with existing infrastructure footprints to avoid the impacts to both current and recovering habitats on the INL Site.
- Two new power transmission structures were installed near NRF. Both were tubular in design and without crossarms, so they cannot be used for nesting by ravens or hawks.

Conservation Measure 3—Infrastructure development within the SGCA or within 1 km (0.6 mi) of an active lek will be avoided unless there are no feasible alternatives.

- Only one infrastructure project was initiated within the SGCA. DOE-ID consulted with the USFWS about how to minimize impacts to sage-grouse. This project was the Carbon Free Power Project and has since been discontinued. Revegetation and compensatory mitigation for the removal of potential sagebrush habitat will take place in years following.

5.1.3 Threat: Livestock

Conservation Measure 5—Encourage Bureau of Land Management (BLM) to take steps to keep livestock off leks and provide them with updated lek locations.

- During the 2023 sage-grouse lek counts, biologists observed livestock on one lek along the Frenchmans cabin lek route between March 20 and May 15.

Conservation Measure 6—Communicate and collaborate with BLM to maintain the herbaceous understory for the benefit of sage-grouse and to ensure rangeland improvements follow guidelines.

- DOE-ID and BLM continued to collaborate on updating their Memorandum of Understanding for management of land currently occupied by the INL Site.
- Bipartisan Infrastructure Law funding was allocated for a local sagebrush seed collection to take place on the INL Site in 2023 in collaboration between INL, BLM and USFWS. This seed is intended to be planted on previously burned areas on the INL Site and adjacent BLM lands to promote the recovery of sagebrush habitat.

5.1.4 Threat: Seeded Perennial Grasses

Conservation Measure 7—Rehabilitate disturbed areas using only native seed mixes that are verified free of crested wheatgrass contamination.

- Project-specific native perennial seed mixes that exclude crested wheatgrass are being recommended by BEA's NRG for all revegetation work.
- It is mandatory that all seed mixes exclude intentional use of crested wheatgrass seed. Because crested wheatgrass is not native, it is never included as acceptable plant materials in INL Site revegetation plans.

5.1.5 Threat: Landfills and Borrow Sources

Conservation Measures 8 and 9—Do not disturb lekking sage-grouse at borrow sources, ensure sagebrush habitat is not lost outside administrative boundaries due to borrow pit or landfill development, and control noxious and other invasive weed species.

- INL complied with seasonal and time-of-day restrictions.
- No new borrow pits or landfills were opened.
- The T-12 pit was expanded to support increased use. To achieve no net loss of sagebrush because of this expansion the project will follow the INL compensatory mitigation strategy.
- INL added requirements to programmatic documents to ensure that adequate weed control measures are implemented throughout the life of an active borrow source or landfill.

5.1.6 Threat: Raven Predation

Conservation Measure 10—Opportunistically reduce raven nesting on infrastructure.

- Double crossarms were replaced on eight INL-controlled transmission structures, permanently excluding future raven nesting at these sites.
- In total, 64 INL-controlled transmission structures have been retrofitted (10.9%).

5.1.7 Threat: Human Disturbance

Conservation Measures 12 and 13—During the lekking and nesting periods, minimize human disturbance of sage-grouse on leks across the INL Site and nesting hens within the SGCA.

- All unmanned aerial vehicle flights complied with CCA requirements regarding timing and distance from leks during early mornings and late evenings within the sage-grouse breeding period.
- Detonations of explosives greater than 1,225 kg (2,700 lb) did not occur at the National Security Test Range (NSTR) between 6 p.m. and 9 a.m. from March 15 to May 15.
- No meteorological, sound detection and ranging, or other cell towers were erected within 1 km (0.6 mi) of a sage-grouse lek or within the SGCA.

5.2 Reports on Projects Associated with Conservation Measures

Since the CCA was signed, DOE-ID and contractors have implemented activities on an as-needed or recurring basis to reduce impacts to sage-grouse habitats and to support the objectives of specific Conservation Measures. The following activities highlight activities associated with specific Conservation Measures that were carried out in 2023.

5.2.1 Post-fire Recovery Planning, Implementation, and Monitoring— Conservation Measure 1

Summary of Results: There were two small wildland fires < 40 ha (99 acres) on the INL Site in 2023. Post-fire recovery plans developed for four of the 2020 fires and for the 2019 Sheep Fire continue to be implemented. Post-fire ecological recovery actions include noxious weed control, cheatgrass monitoring and treatment, and sagebrush restoration.

Introduction

This section of the report contains a summary of the active fire recovery plans, ongoing restoration actions associated with those plans, and a summary of activity for older wildland fires with any ongoing recovery treatments.

The threat level of wildland fire was ranked as high in the CCA (DOE-ID and USFWS 2014) and wildland fire is one of the top threats to sage-grouse (Federal Register 2010), especially in the western portion of their range (Brooks et al. 2015). Based on the analysis of the threat of wildland fire to sage-grouse, a conservation measure was developed for inclusion in the CCA that stated an assessment evaluating the need for post-fire restoration would be prepared and DOE-ID would guide an approach for hastening sagebrush reestablishment on fires larger than 40 ha (99 acres). This conservation measure was recently updated to emphasize a more holistic approach to wildland fire recovery (INL 2023). In addition to sagebrush restoration, post-fire recovery objectives now include soil stabilization, cheatgrass and noxious weed control, and maintaining a healthy herbaceous understory.

After the CCA was signed, the INL Site did not experience any wildland fires meeting the conservation measure criteria for nearly five years, but several larger fires burned in 2019 and 2020. Post-fire recovery plans were developed for four of the wildland fires that burned in 2020 and for the 2019 Sheep Fire. The Sheep Fire Recovery Plan will expire at the end of fiscal year 2024 and the 2020 Fires Recovery Plan will expire at the end of fiscal year 2025.

2020 Fires

In 2020, an ecological resources post-fire recovery plan was completed for four of the fires that burned that year, the Howe Peak Fire, the Telegraph Fire, the Cinder Butte Fire, and the Lost River Fire (Forman et al. 2021). The recovery plan included an assessment of the ecological resources impacted by the fires and addressed four primary recovery objects. The plan also included several options for meeting recovery objectives and a phased implementation approach based on restoration priorities and available funding.

Under approved emergency stabilization actions listed in the existing Wildland Fire EA (DOE-ID 2003), the INL completed containment line recontouring on the fires where they were used during the fall of 2020. Upon completion and review of the ecological resource recovery plan, additional recovery actions that were prioritized by INL's Wildland Fire Management Committee included: monitoring temporary fire suppression access roads for natural recovery, ongoing noxious weed inventory and treatment, and sagebrush restoration. Initial evaluations of access roads are scheduled to be completed during the summer 2024 field season and noxious weed treatments were implemented through INL's noxious weed program. Because the area was used extensively by collared sage-grouse, it is in proximity to an active lek, and restoration would provide some habitat connectivity across the burned area, a total of 41,300 sagebrush seedlings were planted in the Telegraph Fire in October 2022 and monitored for survivorship in 2023 (see Section 5.2.2).

2019 Fires

In 2019, the Sheep Fire burned more than 40,000 ha (98,842 acres) on the INL Site and the Sheep Fire Ecological Resources Post-Fire Recovery Plan (Forman et al. 2020) was completed to facilitate restoration planning. Soil stabilization activities were completed on the Sheep Fire containment lines in 2020 and the Wildland Fire Management Committee prioritized restoration/treatment actions within two post-fire recovery objectives: noxious weed/cheatgrass control and big sagebrush habitat restoration.

Noxious weed treatment continued throughout the Sheep Fire footprint in 2023 and will remain a focus over the next several years. In 2023, rush skeletonweed (*Chondrilla juncea*) and musk thistle (*Carduus nutans*) were the two most frequently encountered noxious weeds. They were sprayed along roadsides with a vehicle-mounted tank and in the backcountry using backpack sprayers. After an unsuccessful attempt at aerial sagebrush seeding in 2020 (Forman et al. 2020), six areas were identified as a high priority for sagebrush seedling planting in the Sheep Fire. The proposed planting sites were selected based on CCA priority restoration areas, logistics and access, ecological condition of the recovering herbaceous plant community, and agency stakeholder input (Kramer et al. 2021). A total of 45,000 seedlings were planted in the Sheep Fire burned area in October 2021 and another 45,000 were planted in October 2022 (see Section 5.2.2).

Pre-2018—Older Fires

There is ongoing treatment activity on several older wildland fires for which recovery plans were not written or have expired. Noxious weeds continue to be treated and monitored across the INL Site, and previously burned areas are prioritized because areas lacking sagebrush tend to be less resilient to weed invasion. Occasionally, sagebrush is planted in areas that burned more than five years ago to continue reducing recovery time in those areas. For example, in 2021, sagebrush was planted in the 2010 Jefferson Fire as part of a collaborative partnership with Idaho Department of Fish and Game (IDFG) and Pheasants Forever to improve sage-grouse wintering habitat. Approximately 12,000 seedlings were planted in 2022 in an area between East Butte and Middle Butte that burned in 2007 and 2010 and hosted active sage-grouse leks prior to wildland fire. The seedlings were planted to fulfil compensatory mitigation requirements for construction of a new power line. An additional 74,875 seedlings were planted in the same area in 2023 in anticipation of upcoming infrastructure projects that will require compensatory sagebrush mitigation.

In 2022, DOE-ID, INL, USFWS, and BLM partnered to pursue Bipartisan Infrastructure Law (BIL) funding to support sagebrush habitat restoration in the Tractor Flats area of the INL Site and adjacent BLM land, some of which burned most recently in the 2010 Jefferson Fire. Despite post-fire declines in habitat condition, Tractor Flats continues to be used by sage-grouse for breeding, nesting, and overwintering. Funding was awarded to the multiagency partnership beginning in 2023. A commercial seed collection vendor collected sagebrush seed within the unburned areas of the southern and eastern portion of the INL Site (Figure 5-1) and on adjacent BLM land in November 2023. The seed was cleaned and stored in a BLM seed warehouse and will be used for mechanical planting of approximately 810 ha

(2,000 acres) on the INL Site in 2024 (Figure 5-1) as well as a slightly larger area on adjacent BLM land. Seed collection will occur again in 2024, and both agencies will plant again in 2025.

In addition to the sagebrush restoration efforts at Tractor Flats, DOE-ID and INL requested BIL funding to procure Open Range (granular) Imazapic herbicide for cheatgrass dominated areas in the Sheep Fire. Funding would be sufficient to treat a total of 3,683 ha (9,100 acres), or about 40% of the area dominated by cheatgrass on the INL Site. Treatments would be phased in over four years and the areas with the greatest potential for a successful outcome would be treated first. If funding becomes available for the herbicide, the treatments would be implemented by INL F&SS and monitored by INL NRG.

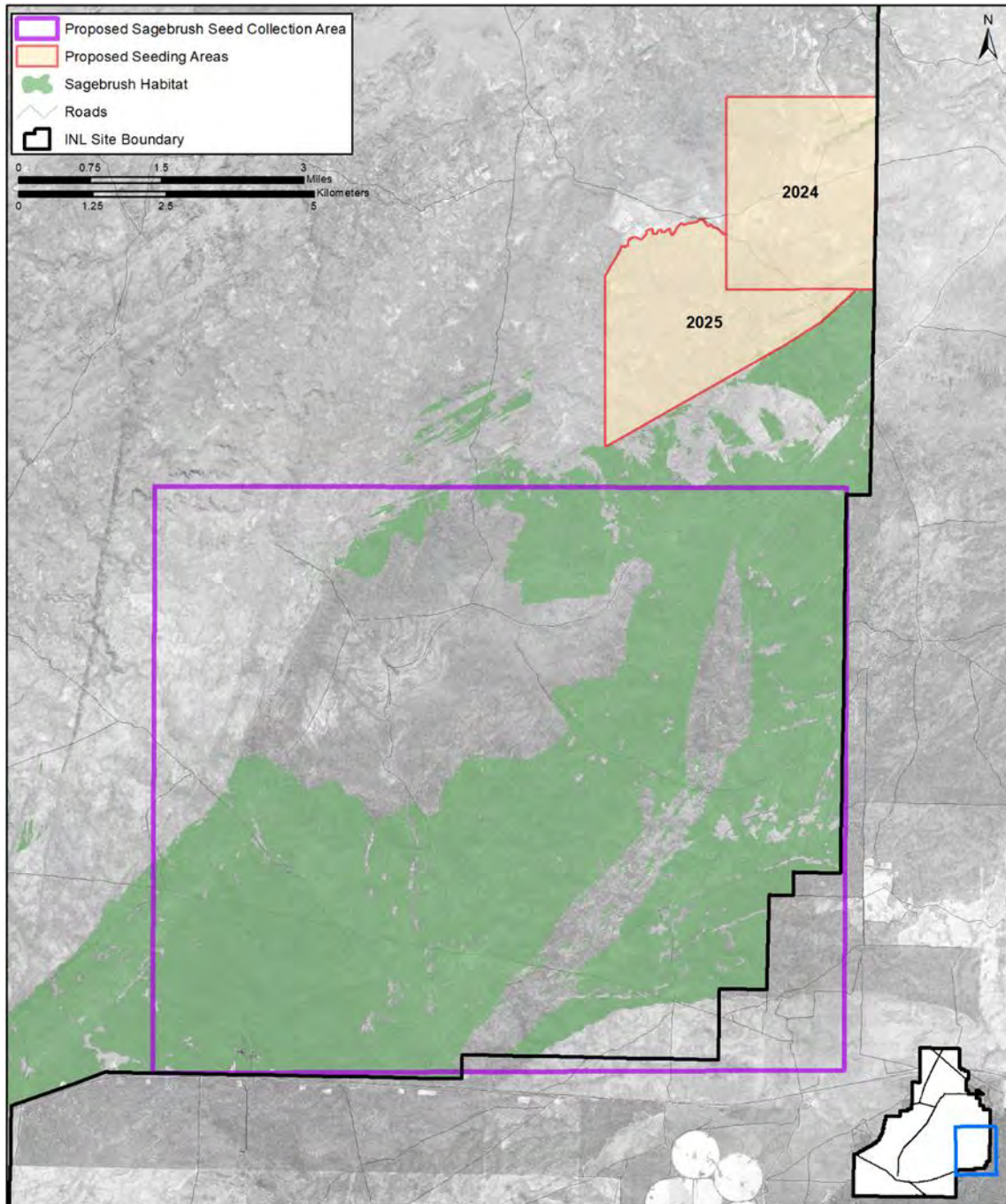


Figure 5-1. Sagebrush seed collection and proposed mechanical seeding locations for sagebrush habitat restoration efforts within the Tractor Flats area of the Idaho National Laboratory Site.

Programmatic Changes to Improve Fire Suppression and Ecological Recovery

Emergency wildland fire response and associated soil stabilization actions are addressed in the INL Wildland Fire EA (DOE-ID 2003). Because of changes in fire frequency and land cover over the past twenty years, many of the fuels management and post-fire recovery actions currently under consideration for the INL Site were not evaluated in the 2003 EA. Therefore, the INL has identified the need to update their fuels management, fire suppression, and wildland fire recovery approach and associated National Environmental Policy Act evaluation. The INL Fire Department is updating the current fuels management and fire suppression plan, and the NRG is drafting a new post-fire recovery framework. Combined, these documents will facilitate a more comprehensive and efficient planning and response effort for fuels management, fire suppression, and post-fire restoration in the future. In August 2023, DOE-ID issued an Environmental Assessment Determination for a new EA to analyze potential impacts of wildland fire prevention, management, and recovery activities at the INL Site, as outlined in the updated fuels management and suppression plan, and the wildland fire recovery framework.

5.2.2 Sagebrush Seedling Planting for Habitat Restoration—Conservation Measure 1 and 2

Summary of Results: INL managed the planting of 74,875 sagebrush seedlings in fall of 2023 in areas of the 2010 Middle Butte Fire and the 2007 Twin Buttes Fire that were prioritized for restoration. Survivorship of seedlings planted in 2022 was approximately 13 percent. The five-year survivorship of seedlings planted in 2018 was approximately 67 percent.

Introduction

The objective of Conservation Measure 1 is to minimize the impact of habitat loss due to wildland fire and firefighting activities, and the objective for Conservation Measure 2 is to minimize the impact of habitat loss due to infrastructure development and disturbance (Section 5.1). DOE-ID began planting sagebrush seedlings in 2015. Since then, sagebrush plantings have gotten larger as more stakeholders have turned their attention and funding toward sagebrush habitat restoration. Sagebrush planting efforts include strategically planting within older burned areas, planting to address objectives in wildland fire recovery plans, and planting for compensatory mitigation. The intent of these sagebrush planting efforts is not to plant sagebrush at densities that typify sage-grouse habitat, but rather to establish sagebrush seed sources over larger priority areas to shorten the time interval between a fire and the reestablishment of sagebrush habitat.

Results and Discussion

During the fall of 2023, 74,875 sagebrush seedlings were planted across four adjacent strips within a general area, initiating sagebrush restoration of approximately 170.6 ha (421.7 acres; Figure 5-2). Seedlings were funded and acquired in anticipation of the need for compensatory mitigation in response to future INL projects that removed sagebrush. The 2023 planting was located within portions of the 2010 Middle Butte Fire and the 2007 Twin Buttes Fire. To inform and to improve future plantings, different methods or materials (hereafter ‘treatments’) were tested in each strip of the area planted. The treatments include the standard soil medium used over the past several years (control), the addition of vermiculite in the soil medium, the addition of a hydrogel in the soil medium, the addition of a mycorrhizal inoculant in the soil medium, and the installation of protective cages around a subset of the control group seedlings. In the control strip, 18,000 seedlings were planted across 45.1 ha (111.4 acres) and of those 18,000, approximately 500 were planted with protective mesh cages around them. In the other treatment strips, 16,500 hydrogel seedlings were planted across 40.3 ha (99.5 acres), 20,175 vermiculite seedlings were planted across 42.2 ha (104.2 acres), and 20,200 mycorrhizal seedlings were

planted across 43.1 ha (106.6 acres). For future monitoring, at least 500 seedling locations from the control and each treatment were marked except for the caged seedlings in which only 480 were relocated and marked following installation.

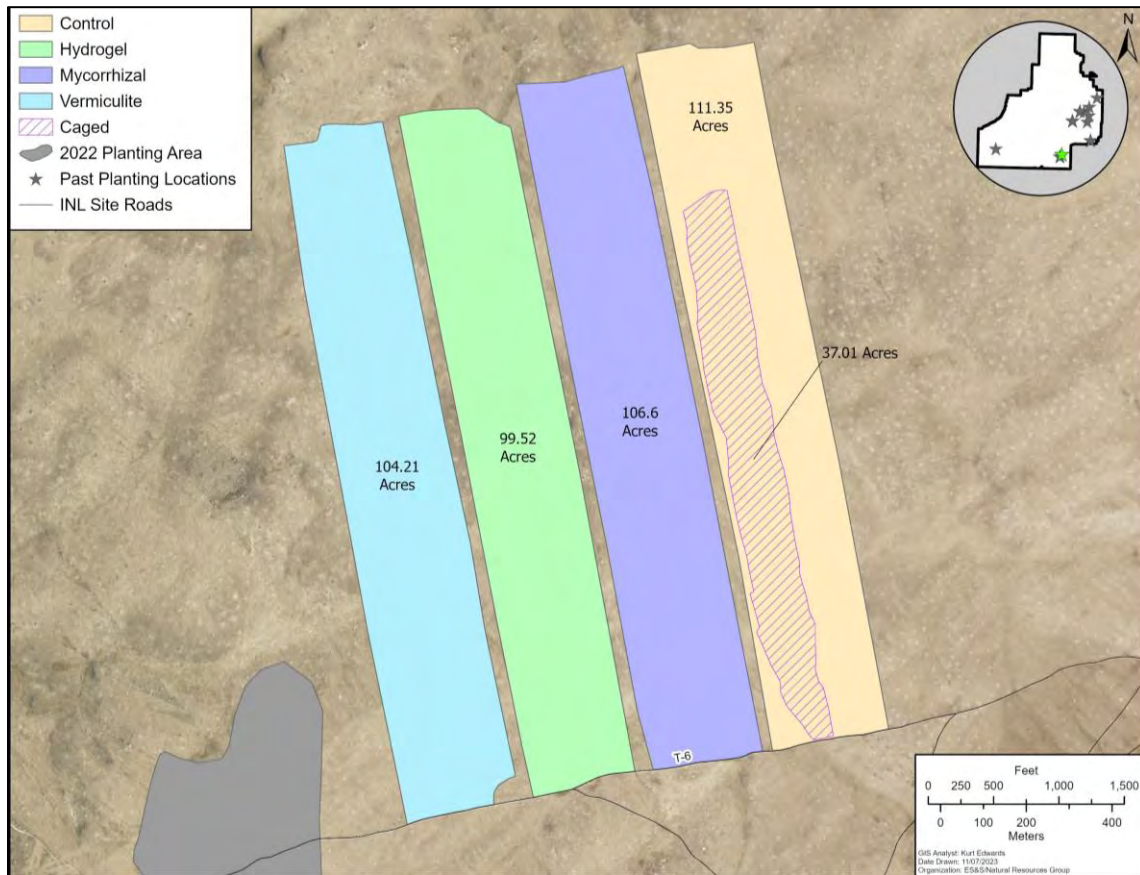


Figure 5-2. Area planted with big sagebrush (*Artemisia tridentata*) seedlings in 2023 with reference to previous years plantings on the Idaho National Laboratory Site. Seedlings were grown in three separate growth medium additions and in standard soil used in past years (i.e., a control), and protective mesh cages were installed on a subset of control seedlings.

Survivorship surveys of the subset of seedlings planted across three locations within the Sheep Fire footprint in 2022 indicated that 4 seedlings were healthy, 3 were stressed, 15 were dead, and 647 were missing. Survivorship surveys of the subset of seedlings planted in the Telegraph Fire footprint in 2022 indicated that 94 seedlings were healthy, 25 were stressed, 3 were dead, and 378 were missing. Survivorship surveys of the subset of seedlings planted in the Middle Butte Fire and Twin Buttes Fire footprints in 2022 indicated that 104 seedlings were healthy, 10 were stressed, 2 were dead, and 384 were missing. Assuming the missing seedlings were dead, approximately 13.4% of all seedlings planted in 2022 survived the first year. This result is higher than the 2019 and 2020 plantings, and around the same as the 2021 planting but remains much lower than plantings between 2015 and 2018 (see Figure 5-3).

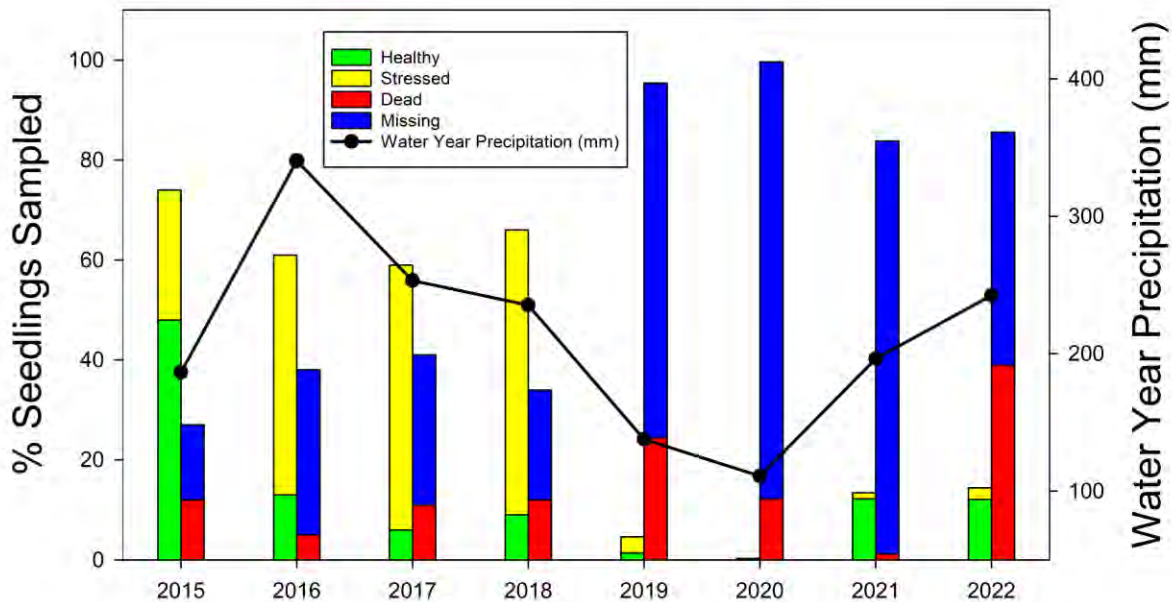


Figure 5-3. Sagebrush seedling survivorship one year after planting on the Idaho National Laboratory Site. The yellow and green bar represents the observed living seedlings. The blue and red bar represents seedlings presumed to be dead. The black dots indicate the total water year precipitation. Water year is calculated as precipitation received in October of the planting year to September of the following year.

Low seedling survivorship could be due to many variables, but it appears that regular deviations from precipitation timing and lower-than-average annual accumulation are likely contributing factors to low seedling survivorship over the past three years. Missing seedlings or, seedlings that were not able to be relocated the following year, can be a result of herbivory (e.g., livestock, wild ungulates, small mammals), death and decomposition, or less frequently, detection error. It is unfortunate that the 2019, 2020, and 2021 plantings have deviated from a trend of successful plantings, but it can provide an opportunity to better inform the planting process and allow us to explore new techniques or approaches, such as the ones tested this year, to increase the success of future planting efforts.

To evaluate five-year survivorship, 896 seedlings planted in the fall of 2018 were revisited in the fall of 2023. Six hundred and forty-four seedlings were found. Of these, 469 were healthy and 136 were stressed. This means 67.5% of the marked seedlings have survived. The one-year results of the 2018 planting found that 66% (n = 899) of the seedlings had survived to the fall of 2019 (Shurtliff et al. 2018), so most of the seedlings that survived one year survived five years. The higher survivorship from the five-year survey compared to the one year is likely an artifact of the difficulty of locating the small seedlings one year after planting and the similar survivorship rates between one-year and five-year monitoring efforts suggests plantings only require one year of ideal conditions to become established and persist.

Since 2015, sagebrush seedling planting on the INL Site has been completed on 1,159.3 ha (2864.7 acres). Over the past nine years, a total of 330,625 seedlings have been planted from multiple collaborating agencies, including DOE-ID, BEA, the Idaho Governor’s Office of Species Conservation, and IDFG.

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6. SYNTHESIS AND ADAPTIVE MANAGEMENT RECOMMENDATIONS

6.1 Trends and Threats in a Regional Context

The IDFG annually compiles data and shares results from hundreds of sage-grouse lek counts conducted by its staff and partners. The INL contributes to this dataset by providing lek and route count information on an annual basis (i.e., IDFG lek routes, Figure 2-1). Comparing these two data sets allows the NRG to evaluate if trends observed on the INL Site are like those observed on statewide and/or regional levels. As an example, during the past decade, male attendance on leks across Idaho and on the INL Site have followed a pattern consistent with a cyclic trend, which is common for the species (Rich 1985, Row and Fedy 2017). Specifically, lek route counts in both State and INL datasets increased to a peak in 2016, then declined until 2019 or 2021, then increased each of the past two or three years. State-defined hard and soft population triggers (Idaho 2021) tripped for all important and priority habitat management areas north of the Snake River in central and eastern Idaho in 2018 and 2019 because of the multi-year decline (Kemner 2023). Likewise, in 2022, the three-year running average of baseline lek attendance on the INL Site dropped below the CCA-designated threshold, tripping the INL's population trigger. As stipulated in the CCA, the DOE-ID and USFWS discussed current management approaches and changes in site activities and implementation of additional conservation measures. Upon completion of this review, it was determined by both parties that the population decline on the INL was consistent with regional and statewide trends, and as such, no immediate action was to be taken.

In 2023, male sage-grouse attendance on Idaho lek routes increased 8% when compared to 2022 (Kemner 2023) with the NRG observing a lek route attendance increase of 13.5% during the same period (Section 2.1.2). Male sage-grouse attendance at INL baseline leks also increased 11.2% in 2023, resulting in a subsequent increase of the running three-year average sufficient to reset the INL population trigger. Of note, peak male attendance at baseline leks has increased each year since 2021, suggesting that INL sage-grouse populations may be entering a growth phase of a population cycle.

Although the State has established habitat distribution triggers (Idaho 2021) like the INL Site, and the State recommends managing habitat condition so that it meets the same general guidelines as those used for the INL Site, results of local and/or regional summaries are not annually published for management areas at a fine enough scale to facilitate direct comparisons of habitat distribution and/or condition every year. The most recent summaries were published in 2020 as part of a causal factor analysis (Idaho Adaptive Management Team 2020). Of the fine-scale management areas that overlap the INL Site, the adaptive management team reported that a soft habitat trigger (a decrease in distribution of >10% but < 20%) was tripped in the Mountain Valley Important Habitat Management Area, which extends onto approximately the northern one-quarter of the INL Site. This trigger was tripped due primarily to two wildland fires that did not directly affect the INL Site.

There were no habitat triggers tripped within the Desert Conservation Area, which includes the southern three-quarters of the INL Site. Within the Desert Conservation Area, much of the INL Site is included in the Twin Buttes Target Fine Scale Area. Landscape cover of sagebrush across this Fine Scale Area was estimated to be between 60% and 70% across all seasonal habitat types, which is comparable to the distribution of sagebrush habitat across the INL Site. The Idaho Adaptive Management Team has identified the Tractor Flats area within the Twin Buttes Target Fine Scale Area as important winter habitat and has recommended that minimizing any further loss of sagebrush and restoring sagebrush where it has been lost, particularly from the 2010 Jefferson Fire, should be considered top management priorities. They have also recommended identifying priority areas where cheatgrass control can be used to improve nesting habitat. INL habitat condition data and spatial vegetation distribution data (Shive et al. 2019) indicate the most extensive cheatgrass-dominated areas within the Jefferson Fire footprint are

also within Sheep Fire footprint, located west of Tractor Flats. Four potential cheatgrass treatment areas have been identified within the overlapping footprints of these two fires.

Although habitat condition data from the INL Site indicate that cheatgrass is more abundant in burned areas than intact sagebrush habitat, post-fire areas on the INL Site are still largely dominated by native, perennial species. Cheatgrass cover can fluctuate considerably from one year to the next and a decrease in cover is as likely as an increase (Forman and Hafla 2018), so it is important to interpret annual changes within the context of longer-term patterns. Because cheatgrass cover generally does not increase at the expense of cover from native perennial species, it does not appear to be affecting overall habitat condition. There are localized areas on the INL Site where cheatgrass has become dominant (Shive et al. 2019), but they are limited in extent and are not yet widespread enough to influence the fire regime. Although the fire regime at the INL Site is not driven by cheatgrass dominance, fires have been more frequent in the past 30 years when compared to the previous 30 years, most likely due to changes in weather patterns and other anthropogenic influences. Therefore, the INL continues to prioritize reducing wildland fire impacts to habitat by minimizing fire size and by implementing post-fire recovery strategies.

The CCA and resulting relationship between its signatories have helped DOE-ID and its contractors take proactive, focused measures (Section 5.1, Appendix A) to conserve sage-grouse while still pursuing DOE-ID's mission. The agreement and conservation measures therein have also been the impetus for strengthening relationships with natural resource partners to collaborate on projects relevant to sage-grouse. For example, in 2023, BIL funding was awarded to USFWS, BLM, and DOE-ID to facilitate a large-scale sagebrush seed collection effort on the INL Site and adjacent BLM property. The seed will be used to support sagebrush restoration in important winter habitat that spans DOE-ID/BLM boundaries. Additionally, DOE-ID shares habitat data with BLM when allotments are reassessed, and BLM invites DOE-ID to participate in grazing allotment assessments on the INL Site. This increased collaboration and pursuit of common land management goals are among the benefits that has resulted from DOE-ID's efforts, via the CCA, to join with federal and state partners to conserve sage-grouse and sagebrush lands in eastern Idaho.

6.2 Proposed Changes to the CCA

No changes to the CCA were proposed during 2023.

6.3 Adopted Changes

No changes to the CCA were adopted during 2023.

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APPENDIX A. ACCOMPLISHMENTS IN 2023 FOR EACH CONSERVATION MEASURE

Table A-1. Accomplishments in 2023 for each measure listed in the CCA for greater sage-grouse on the Idaho National Laboratory Site.

Threat:	Wildland Fire
Objective:	Minimize the impact of habitat loss due to wildland fire and firefighting activities.
Conservation Measures:	1) Prepare an assessment for the need to restore the burned area. Based on that assessment, DOE-ID would prepare an approach for hastening sagebrush reestablishment in burned areas and reduce the impact of wildland fires >40 ha (99 acres).
<p>Conservation Measure 1—Accomplishments in 2023:</p> <p><u>BURN ASSESSMENT</u>— Two fires occurred on the INL Site that burned approximately 5.6 ha (14 acres). Because they were below the minimum size, neither fire warranted an assessment for the need to restore the burned areas.</p> <p>Associated Actions that Addressed the Wildland Fire Threat:</p> <p><u>WILDLAND FIRE PREPAREDNESS</u> – In order to slow wildland fire and provide for a better defense area, fire breaks/buffers have been created and are routinely maintained around facilities and along the major roadways. In 2023, BEA F&SS mowed 6–12 m (20–40 ft) firebreaks along 190 km (118 mi) of roadways and around 27 facilities and other infrastructure.</p> <p><u>UPDATE THE INL APPROACH TO FUELS MANAGEMENT, FIRE SUPPRESSION, AND FIRE RECOVERY</u>– To better address preparedness, response, and recovery from wildland fires, the INL Fire Department is updating an existing plan for fuels management and fire suppression and the NRG is drafting a fire recovery framework for the INL Site. A new Environmental Assessment (EA) will evaluate the proposed actions contained in both plans.</p> <p><u>SAGEBRUSH REESTABLISHMENT</u>– INL planted 74,850 seedlings within the 2010 Middle Butte Fire and 2007 Twin Butte Fire to support habitat restoration efforts. Weed control efforts continue in recently burned areas. A subset of sagebrush seedlings planted in 2022 and 2018 were revisited in 2023, and 1-year and 5-year survivorship was assessed (Section 5.2.2).</p>	
Threat:	Infrastructure Development
Objective:	Avoid new infrastructure development within the SGCA and 1 km (0.6 mi) of active leks and minimize the impact of infrastructure development on all other seasonal and potential habitats on the INL Site.
Conservation Measures:	2) Adopt Best Management Practices outside facility footprints for new infrastructure development. 3) Infrastructure development within the SGCA or within 1 km (0.6 mi) of an active lek will be avoided unless there are no feasible alternatives.
<p>Conservation Measure 2—Implementation of Best Management Practices in 2023:</p> <p>In 2023 multiple projects outside facility footprints adopted and implemented best management practices to minimize the impacts to both seasonal and potential habitats on the INL Site.</p>	

Table A-1. (continued).

The following infrastructure projects were designed so that the total distance of habitat edge caused by construction activities was minimized.

- Test Area North-691 maintenance and vehicle-storage building (Environmental Compliance Permit [ECP] INL-20-035 R4) was sited immediately adjacent to the Specific Manufacturing Capability fence.
- The Advanced Test Reactor Complex Parking Lot Refurbishment and Expansion project (ECP INL-22-045) was sited within and around the existing Advanced Test Reactor parking lot.
- The Consolidated Training Facility at the Live Fire Range Complex (ECP INL-22-078 R1) was sited immediately adjacent to the existing range, roads, and power infrastructure.
- The Unmanned Aerial Systems (UAS) Testing project (ECP INL-22-093) installed an additional gravel pad immediately adjacent to existing infrastructure located at the UAS runway.
- Nesting structures at Materials and Fuels Complex and CFA (ECP INL-23-020) were sited directly adjacent to their respective facilities. Power upgrades for potable water systems at the Idaho Nuclear Technology and Engineering Center (EC ICP-23-014) were sited adjacent to previously disturbed areas.

The following infrastructure projects were co-located with existing infrastructure and/or were sited in areas dominated by non-native grasses and other exotic species.

- Infrastructure associated with the Cyprus Yeti project (ECP INL-21-087 R4) was sited within the previously developed Bode test bed and all additional testing locations are in previously disturbed areas.
- The Radiological dispersal Device/ Improvised Nuclear Device Material Training Activities and Evaluations Using Radiation Emitting Sources/Materials/Devices project (ECP INL-17-069 R3) was sited within the Radiological Response Training Range located in the previously defined administrative area of the T-28 south borrow pit.
- Areas Associated with USG #121 Test (ECP INL-22-022 R1) were sited only in previously disturbed footprints.
- The GANNETT project (ECP INL-18-059 R4) testing locations were sited in areas dominated by crested wheatgrass or within previously disturbed footprints.
- The West CFA Power Infrastructure & CF-686 buildout project (ECP INL-23-007) sited new infrastructure within existing power infrastructure corridors.

Best Management Practices employed in INL Power Management Activities 2022 (ECP INL-21-067 R1) included the installation of avian protection devices where possible. Of note is the installation of two new power transmission structures near NRF. These were installed so lines could be rerouted toward a substation built in 2023 at NRF. Both structures were tubular in design and were without crossarms, so they cannot be used for nesting by ravens or hawks. A nearby transmission structure with double wooden crossarms was removed as part of the process.

COMPENSETORY MITIGATION: The sagebrush seedlings discussed in Conservation Measure 1 were planted in anticipation of compensatory mitigation being needed for future infrastructure projects at the INL Site. Multiple projects currently taking place on the INL Site are going to be required to carry out compensatory mitigation for existing and potential sagebrush habitat destruction. These projects will be assessed following their activities to determine the amount of area requiring compensatory mitigation per the INL compensatory mitigation strategy.

Table A-1. (continued).

Conservation Measure 3—Accomplishments in 2023:	
Only one project, the Carbon Free Power Project Site Characterization activities (ECP INL-19-067 R5), continued to conduct activities associated with infrastructure development within the SGCA in 2023. This project has consulted DOE-ID and USFWS on how to mitigate risks to sage-grouse including adhering to additional seasonal and time of day restrictions for those activities to take place. In 2023 this project was discontinued. Revegetation and compensatory mitigation for the removal of potential sagebrush habitat will take place in the years following.	
Threat:	Annual Grasslands
Objective:	Maintain and restore healthy, native sagebrush plant communities.
Conservation Measure:	4) Inventory areas dominated or co-dominated by non-native annual grasses, work cooperatively with other agencies as necessary to identify the actions or stressors that facilitate annual grass domination, and develop options for eliminating or minimizing those actions or stressors. DISCONTINUED (See Section 6.2.4, Shurtliff et al. [2019]).
Conservation Measure 4—Discontinued	
Threat:	Livestock
Objective:	Limit direct disturbance of sage-grouse on leks by livestock operations and promote healthy sagebrush and native perennial grass and forb communities within grazing allotments.
Conservation Measures:	5) Encourage the BLM to seek voluntary commitments from allotment permittees and to add stipulations during the permit renewal process to keep livestock at least 1 km away from active leks until after May 15 of each year. Regularly provide updated information to BLM on lek locations and status to assist in this effort. 6) Communicate and collaborate with BLM to ensure that the herbaceous understory on the INL Site is adequately maintained to promote sage-grouse reproductive success and that rangeland improvements follow guidelines in the BLM Land Use Plan and the CCA.
Conservation Measure 5—Accomplishments and Disturbances in 2023:	
<u>LEK DISTURBANCE</u> - During the 2023 sage-grouse lek counts, biologists observed livestock on one lek along the Frenchmans cabin lek route between March 20 and May 15.	
Conservation Measure 6—Accomplishments in 2023:	
<u>COMMUNICATION & COLLABORATION</u> - DOE-ID and BLM continued to collaborate on updating their Memorandum of Understanding for management of land currently occupied by the INL Site. Bipartisan Infrastructure Law funding was allocated for a local sagebrush seed collection to take place on the INL Site in 2023 in collaboration between INL, BLM and USFWS. This seed is intended to be planted on previously burned areas on the INL Site and adjacent BLM lands to promote the recovery of sagebrush habitat.	
Threat:	Seeded Perennial Grasses
Objective:	Maintain the integrity of native plant communities by limiting the spread of crested wheatgrass.

Table A-1. (continued).

Conservation Measure:	7) Inform INL contractors about negative ecological consequences resulting from crested wheatgrass and persuade them to rehabilitate disturbed land using only native seed mixes that are verified to be free of crested wheatgrass contamination.
<p>Conservation Measure 7—Accomplishments in 2023:</p> <p>The NRG assisted projects by recommending a project-specific native perennial seed mix list for revegetation work. It is mandatory that all seed mixes exclude intentional use of crested wheatgrass seed. Because crested wheatgrass is not native, it is never included as acceptable plant materials in INL Site revegetation plans.</p>	
Threat:	Landfills and Borrow Sources
Objective:	Minimize the impact of borrow source and landfill activities and development on sage-grouse and sagebrush habitat.
Conservation Measures:	<p>8) Eliminate human disturbance of sage-grouse that use borrow sources as leks (measure applies only to activities from 6 p.m. to 9 a.m., March 15–May 15, within 1 km [0.6 mi] of active leks).</p> <p>9) Ensure that no net loss of sagebrush habitat occurs due to new borrow pit or landfill development. DOE-ID accomplishes this measure by:</p> <ul style="list-style-type: none"> • avoiding new borrow pit and landfill development in undisturbed sagebrush habitat, especially within the SGCA; • ensuring reclamation plans incorporate appropriate seed mix and seeding technology; • implementing adequate weed control measures throughout the life of an active borrow source or landfill.
<p>Conservation Measure 8—Accomplishments in 2023:</p> <p>INL complied with seasonal and time-of-day restrictions associated with sage-grouse. Per “Idaho National Laboratory Gravel/Borrow Pits (Overarching) Environmental Checklist [EC]” (EC INL-19-155), projects must complete Form 450.AP01, “Gravel/Borrow Source Request Form,” before removing gravel. This form reminds gravel pit users of restrictions in place to protect sage-grouse. Projects must also submit, in writing to Environmental Support and Services personnel, that they complied with the directives in this EC. The borrow sources at Adams Boulevard, Lincoln Boulevard, Monroe Boulevard, Ryegrass Flats, T-12, and T-28 South are covered by this Environmental Checklist. Historically, sage-grouse leks have been observed in three borrow pits: T-12, Adams Blvd., and Ryegrass Flats. Source material was removed from the Ryegrass Flats, T-12, and Adams Blvd borrow pits after 9 a.m. and before 6 p.m., complying with seasonal restrictions.</p> <p>Conservation Measure 9—Accomplishments in 2023:</p> <p>No new borrow pits or landfills were opened in 2023.</p> <p>Expansion of existing borrow sources and landfills is limited to footprints approved in Appendix C of the Spent Nuclear Fuel Environmental Impact Statement (DOE/EIS-0203) or the EA for Silt/Clay Development and Use (DOE-EA-1083) with the exception of the T-12 pit. An expansion beyond the defined boundary of T-12 pit was conducted in 2023 under the Subsurface Disposal Area Borrow Source Actions (EC ICP-22-004) located at T-12 pit and Adams Blvd. pit. This expansion extended the T-12 pit 100 m to the north, east, and south of the existing pit. The expansion of the T-12 pit required a Cultural Resource Review by the Cultural Resource Management Office and Biological Resources Review by the NRG. Facilities and Site Services personnel assist in the identification of approved footprints. The expansion did not occur in the SGCA but is in existing sagebrush habitat. To achieve no net loss of sagebrush because of this expansion the project will follow the INL compensatory mitigation strategy.</p> <p>All landfills and borrow sources are planned to have reclamation activities completed when they are deemed to be no longer of use.</p>	

Table A-1. (continued).

Threat:	Raven Predation
Objective:	Reduce food and nesting subsidies for ravens on the INL Site.
Conservation Measures:	<p>10) DOE-ID will work with INL contractors and the National Oceanic and Atmospheric Administration to opportunistically reduce raven nesting on power lines and towers and at facilities.</p> <p>11) Instruct the INL to include an informational component in its annual Environment, Safety, and Health training module by January 2015 that teaches the importance of eliminating food subsidies to ravens and other wildlife near facilities.</p>
<p>Conservation Measure 10—Accomplishments in 2023:</p> <p>During 2023, double crossarms were replaced on eight government-controlled transmission structures, permanently excluding future raven nesting at these sites (Section 4.1.1). In total, 64 INL-controlled transmission structures have been retrofitted (10.9%).</p> <p>Conservation Measure 11: Completed</p>	
Threat:	Human Disturbance
Objective:	Minimize human disturbance of sage-grouse courtship behavior on leks and nesting females within the SGCA and 1 km (0.6 mi) Lek Buffers.
Conservation Measures:	<p>12) Seasonal guidelines (March 15–May 15) for human-related activities within 1 km (0.6 mi) Lek Buffers both in and out of the SGCA (exemptions apply—see Section 10.9.3):</p> <ul style="list-style-type: none"> • Avoid erecting portable or temporary towers, including meteorological, SODAR, and cellular towers. • Unmanned aerial vehicle flights conducted before 9 a.m. and after 6 p.m. will be programmed so that flights conducted at altitudes <305 m (1,000 ft) will not pass over land within 1 km (0.6 mi) of an active lek. • Detonation of explosives >1,225 kg (2,700 lb) will only occur at the NSTR from 9 a.m.–9 p.m. • No non-emergency disruptive activities allowed within Lek Buffers March 15–May 15. <p>13) Seasonal guidelines (April 1–June 30) for human-related activities within the SGCA (exemptions apply—see Section 10.9.3):</p> <ul style="list-style-type: none"> • Avoid non-emergency disruptive activities within the SGCA. • Avoid erecting mobile cell towers in the SGCA, especially within sagebrush-dominated plant communities.
<p>Conservation Measures 12 and 13—Accomplishments in 2023:</p> <p>The Carbon Free Power Project site is located within the SGCA. Multiple site characterization activities took place between April 1 and June 30 of 2023. All activities were approved by DOE-ID following consultation with USFWS on how to mitigate risks to sage-grouse. In 2023 this project was discontinued. Revegetation and compensatory mitigation for the removal of potential sagebrush habitat will take place in the years following the discontinuation.</p> <p>All unmanned aerial vehicle flights conducted at the UAS runway or at the NSTR met all CCA requirements by conducting flights above 305 m (1,000 ft), after 9 a.m. and before 6 p.m., or beyond the 1 km (0.6 mi) sage-grouse active lek buffer distance. All other overflights planned their flight paths to avoid sage-grouse leks and lek buffers.</p> <p>Detonations of explosives greater than 1,225 kg did not occur at the NSTR between 6 p.m. and 9 a.m. from March 15 to May 15.</p>	

Table A-1. (continued).

No meteorological, sound detection and ranging, or other cell towers were erected within 1 km (0.6 mi) of a sage-grouse lek or within the SGCA during 2023.
