



# Bi-State Sage-Grouse Annual Accomplishment Report 2022 - 2023



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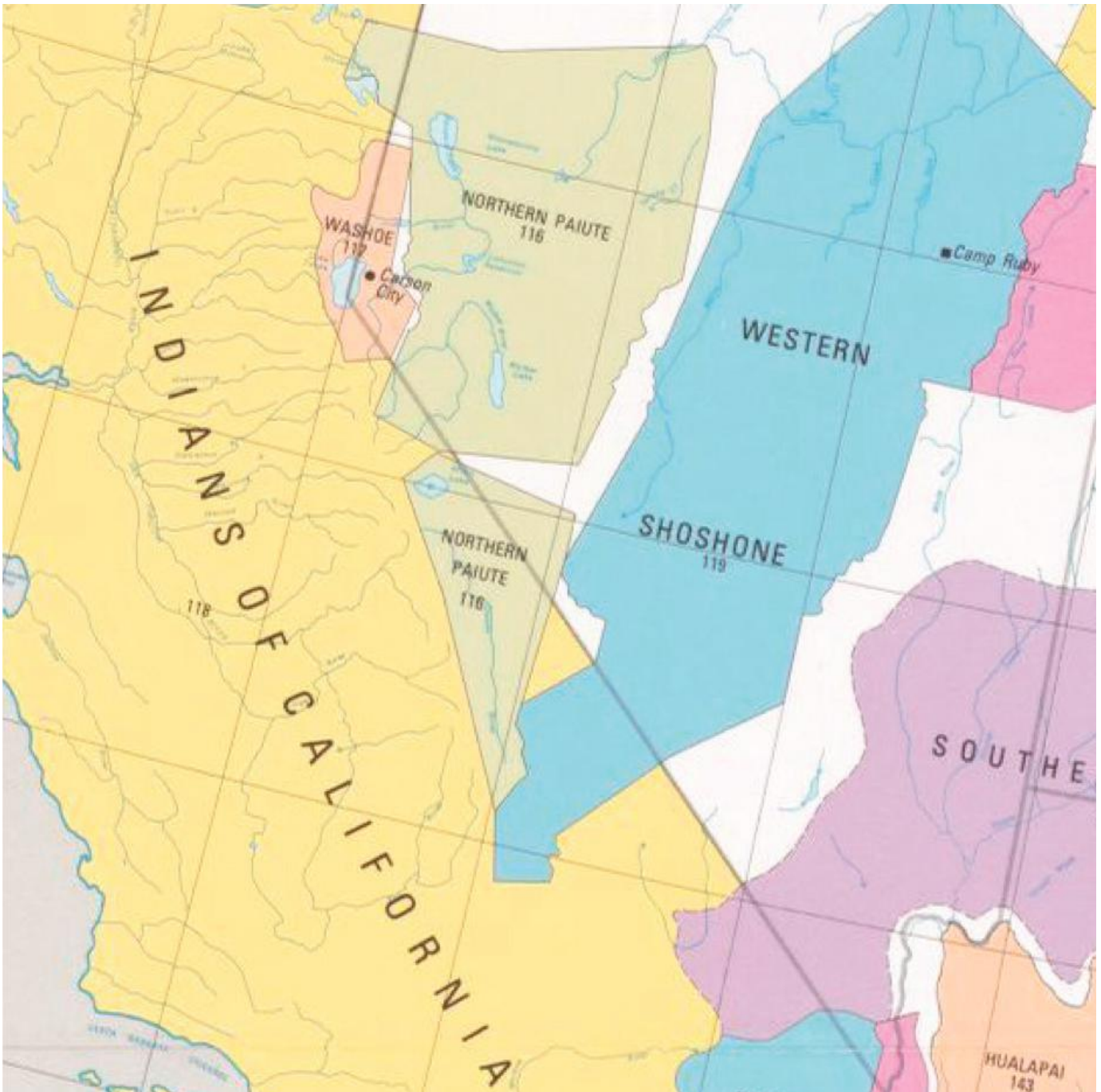
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**Figure 1:** Ancestral lands of the Bi-State area (map source: Indian Claims Commission)

## **ANCESTRAL LANDS ACKNOWLEDGEMENT**

The Bi-State area is located in the heart of the Northern Paiute (Numu) territory and extends to include the lands of the Washoe (Wa She Shu) in the north, and Western Shoshone (Newe) in the south. We honor the Indigenous caretakers who have stewarded these lands, waters, and animals since time immemorial and pay respect to the elders who lived before, the people of today and generations to come.



**EXECUTIVE SUMMARY**

The Bi-State sage-grouse distinct population segment of the greater sage-grouse (*Centrocercus urophasianus*) has been the center of collaborative conservation efforts for two decades. The most recent Action Plan was released in 2012 and provided a roadmap to conserve the sage-grouse and its habitat using a science-based, adaptive management approach. Since then, the actions set forth in the 2012 Plan have been continuously implemented in a coordinated effort involving many diverse stakeholders. Major efforts by Bi-State partners in 2022 and 2023 have focused on research, monitoring, and implementing management actions with the aim of minimizing threats to the sage-grouse and its habitat. In addition to this work, much of 2023 has been devoted to updating the Action Plan to guide the next 10 years of sage-grouse conservation in the Bi-State area. The 2024 Action Plan is currently being developed and is expected to be completed this year. However, until that time Bi-State partners continue their efforts to conserve the sage-grouse by carrying out and maintaining the work set forth in the 2012 Action Plan.

This report summarizes the accomplishments of Bi-State partners in implementing the 2012 Bi-State Action Plan in 2022 and 2023.

**Research and monitoring accomplishments detailed in this report include:**

- Radio and GPS telemetry tracking
- Nest and brood monitoring
- Lek monitoring
- Estimation of sage-grouse population trends, demographic parameters, and space use
- Raven predator surveys
- Vegetation monitoring
- Translocations

**Conservation and management accomplishments detailed in this report address the following threats:**

- Wildfire
- Loss of sagebrush and meadows
- Urbanization
- Human disturbance
- Conifer expansion
- Wild horse grazing
- Invasive species
- Permitted livestock grazing

**Efforts to promote stakeholder involvement and maintain a coordinated interagency approach detailed in this report include:**

- Education and outreach
- Ongoing development of the 2024 Action Plan



## INTRODUCTION

The most recent Bi-State Sage-Grouse Action Plan was written in 2012 and laid out a strategy to conserve the Bi-State distinct population segment (Bi-State DPS) of the greater sage-grouse. The Bi-State area, located along the California and Nevada state border, is divided into six population management units (PMUs) (Fig. 1). The 2012 Action Plan identified and ranked threats within each PMU and provided a roadmap to address those threats via actions designed to protect sage-grouse populations and their habitat.

### Projects in the 2012 Action Plan aimed to:

- implement a coordinated interagency approach
- incorporate science-based adaptive management
- increase regulatory mechanisms
- minimize and eliminate risk
- improve and restore habitat
- monitor sage-grouse populations
- maintain stakeholder involvement

The effort to conserve the Bi-State DPS through the implementation of the 2012 Action Plan involves a collaborative, multi-jurisdictional group of diverse stakeholders (Box 1). The key components of this multi-tiered conservation partnership include 1) the Local Area Working Group (LAWG) which includes all interested parties and serves as a foundation of engaged stakeholders, 2) the Technical Advisory Committee (TAC), which guides the science-based, adaptive conservation strategy, and 3) the Executive Oversight Committee (EOC) which ensures a coordinated interagency approach.

### Box 1. Bi-State Partners

- U.S Fish and Wildlife Service
- U.S. Geological Survey
- U.S Bureau of Land Management
- U.S. Forest Service
- U.S. Natural Resources Conservation Service
- Nevada Department of Wildlife
- California Department of Fish and Wildlife
- L.A. Department of Water and Power
- State and local governments
- NGOs
- Native American Tribes
- Agricultural producers
- Landowners
- Interested citizens



*Bi-State sage-grouse. Photo credit: Bob Wick*

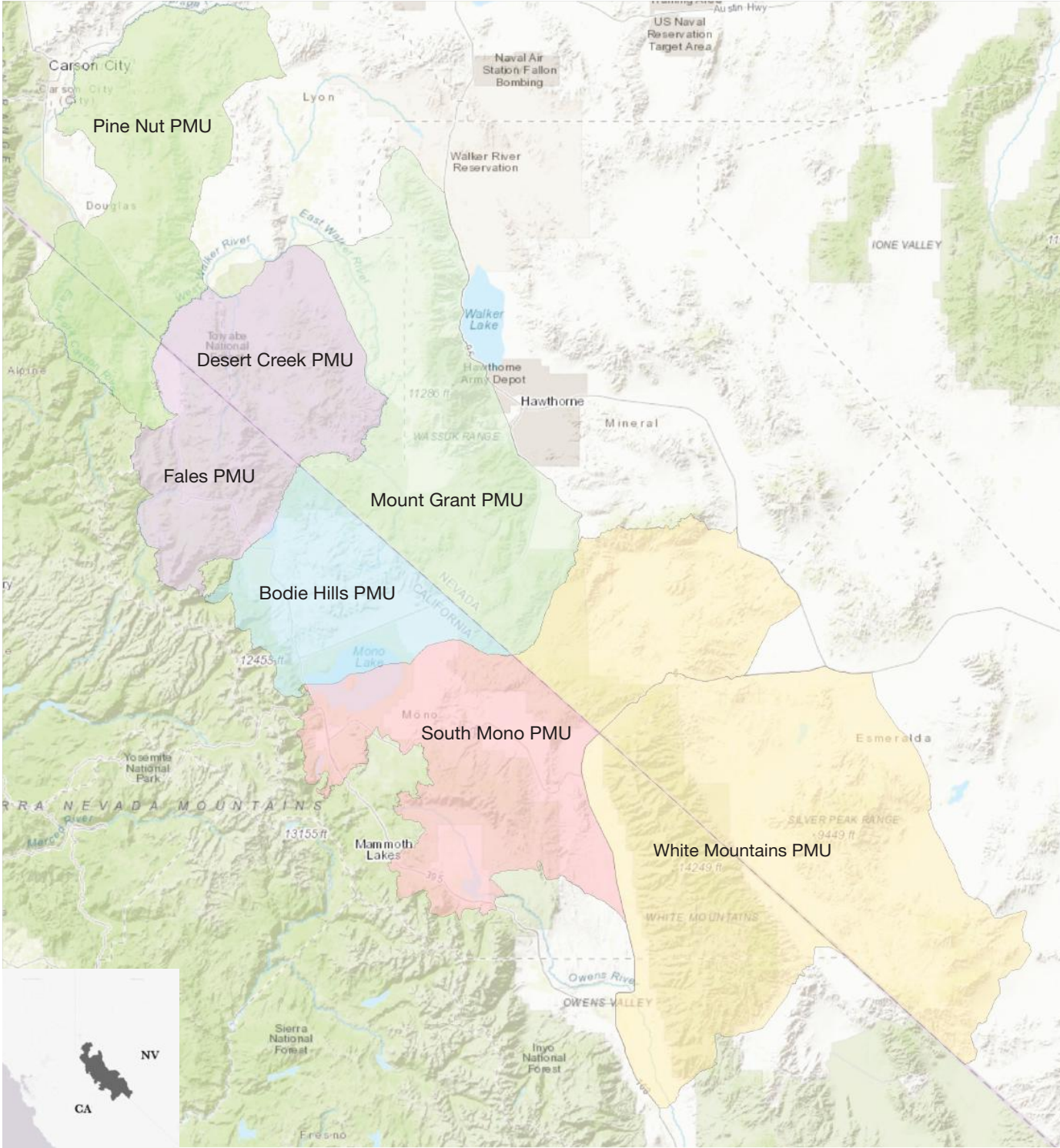
In 2014, agency partners announced a \$45 million dollar commitment to implement the Plan over a 10-year period. As a result, the Bi-State DPS has been the focus of sustained collaborative efforts for over a decade.

### Since 2012 Bi-State partners have:

- Implemented 90% of the actions set forth in the 2012 Action Plan
- Allocated \$55.1M in funding toward the conservation of the sage-grouse and its habitat
- Improved more than 180,000 acres of habitat
- Monitored over 800 vegetation plots to assess the effectiveness of conservation actions
- Radio-marked and monitored over 1,000 sage-grouse across all PMUs

Recent analysis by U.S. Geological Survey (USGS) scientists suggest that leks near conservation efforts have exhibited stronger growth than leks that are not near conservation efforts (USGS unpublished data). Furthermore, likely due to conservation efforts following the 2012 Action Plan, Bi-State sage-grouse populations are 37% larger than if no conservation actions had occurred (USGS unpublished report).

The 2012 Action Plan has now reached the end of its intended 10-year life span and the majority of the actions within it have been completed. Bi-State partners are now in the process of actively developing the 2024 Action Plan. This updated plan will guide the next 10 years of Bi-State sage-grouse conservation and is projected to be released in the winter of 2024. Until that time, Bi-State partners remain committed to carrying out and maintaining work outlined in the 2012 Action Plan.



**Figure 2.** Bi-State Population Management Units.



*Monitoring a Bi-State sage-grouse lek*

## RESEARCH AND MONITORING

In 2022 and 2023, Bi-State partners worked collaboratively to increase our understanding of the basic biology of the sage-grouse, the threats that impact it, and the effectiveness of implemented conservation actions. Research and monitoring efforts are detailed below and include:

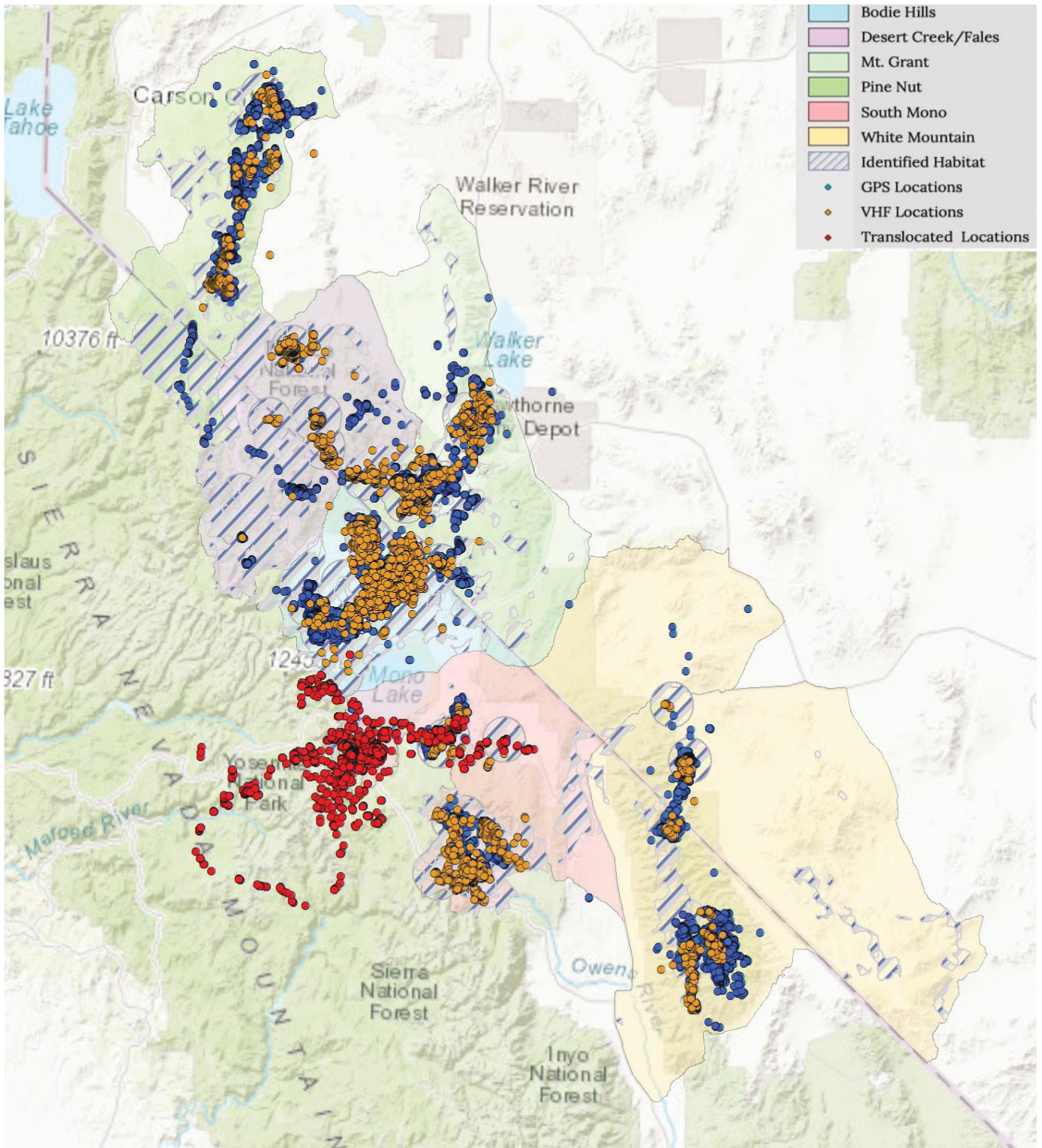
- Radio and GPS telemetry tracking
- Nest and brood monitoring
- Lek monitoring
- Estimation of population trends, demographic parameters and space use estimates
- Raven predator surveys
- Vegetation monitoring
- Translocations



*Sage-grouse chicks being prepared for translocation*



*Telemetry tracking*



*\* This information is preliminary or provisional and is subject to revision*

**Figure 3.** Location data for all tracked sage-grouse and identified sage-grouse habitat in the Bi-State. The number and locations of birds monitored in 2022 and 2023 can be found in Table 1.



## SAGE-GROUSE POPULATION MONITORING

### Radio and GPS Telemetry Tracking

Since 2011, birds from across the Bi-State have been captured in the spring and fall and fitted with Very High Frequency (VHF) or Global Positioning System (GPS) transmitters (Fig. 3). Body measurement data is collected during capture and sage-grouse movement and survival is tracked over multiple years. In 2022 and 2023, 207 birds were captured and monitored in the Bodie Hills, Mount Grant, South Mono, and White Mountains PMUs (Table 1). The total dataset, which includes monitoring from 2011 onward, was then analyzed using models which allow scientists to infer the total area used by grouse.

### Nest and Brood Monitoring

Intensive monitoring is conducted during the nesting and brood-rearing periods to track reproduction and recruitment (Mathews et al., 2018). This data is utilized to estimate nest survival rates and chick survival probabilities. Results are described below in *Trends, Demographics & Space Use* (pg. 10). In 2022 and 2023, nest and brood monitoring was conducted in the South Mono and Bodie Hills PMUs.

### Lek Monitoring

Each spring Bi-State partners collaborate to count sage-grouse as they congregate and perform mating displays at sites called leks (Fig. 4). Lek counts have been reliably conducted for more than two decades in the Bi-State area and this extensive dataset (Fig. 5) has allowed Bi-State partners to generate annual estimates of population size. Establishing long-term population trends for sage-grouse is particularly important because their populations are known to be cyclical (periods of increasing populations sizes followed by periods of decreasing populations sizes), and lek count results may fluctuate from year to year. To determine long-term trends, annual lek count data is incorporated into an Integrated Population Model (IPM) which accounts for low counts or leks not counted and generates population estimates. Bi-State population trends are described in *Trends, Demographics & Space Use* (pg. 10). Leks in all six Bi-State PMUs were monitored between 2022 and 2023. Detailed results from lek counts are presented in the Section *Lek Counts* (pg. 10).

**Table 1.** Number of GPS and VHF transmitters deployed in each PMU in 2022 and 2023.

Year	PMU	GPS	VHF	Total
2022	Pine Nuts	0	0	0
2022	Desert Creek/Fales	0	0	0
2022	Mount Grant	0	23	23
2022	Bodie Hills	0	35	35
2022	South Mono	0	15	15
2022	White Mountains	7	17	24
<b>2022 TOTAL</b>		<b>7</b>	<b>90</b>	<b>97</b>
2023	Pine Nuts	0	0	0
2023	Desert Creek/Fales	0	0	0
2023	Mount Grant	0	26	26
2023	Bodie Hills	0	32	32
2023	South Mono	0	19	19
2023	White Mountains	5	25	30
<b>2023 TOTAL</b>		<b>5</b>	<b>102</b>	<b>107</b>
<b>2022 - 2023 TOTAL</b>		<b>12</b>	<b>192</b>	<b>204</b>

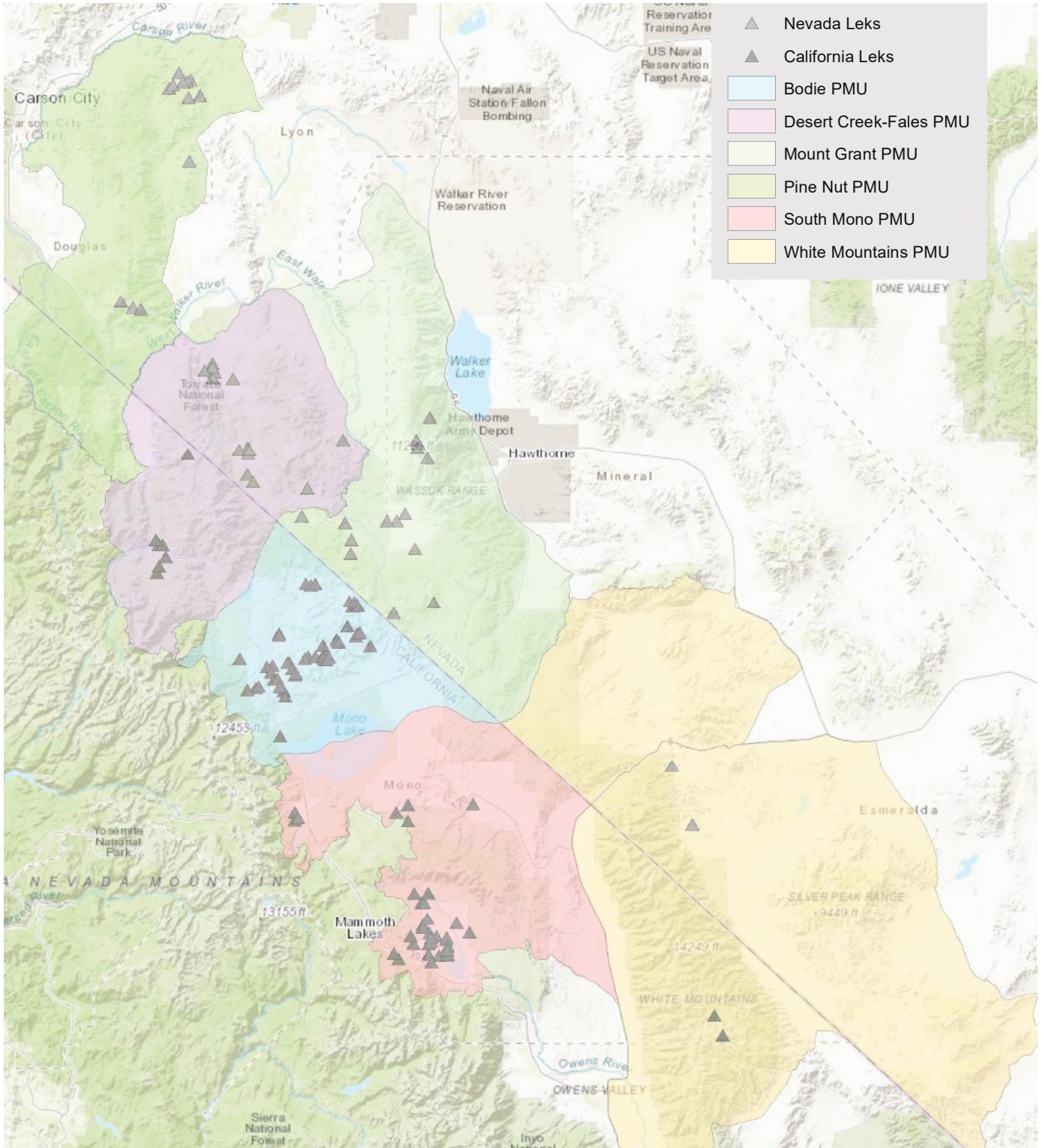
*\* This information is preliminary or provisional and is subject to revision*



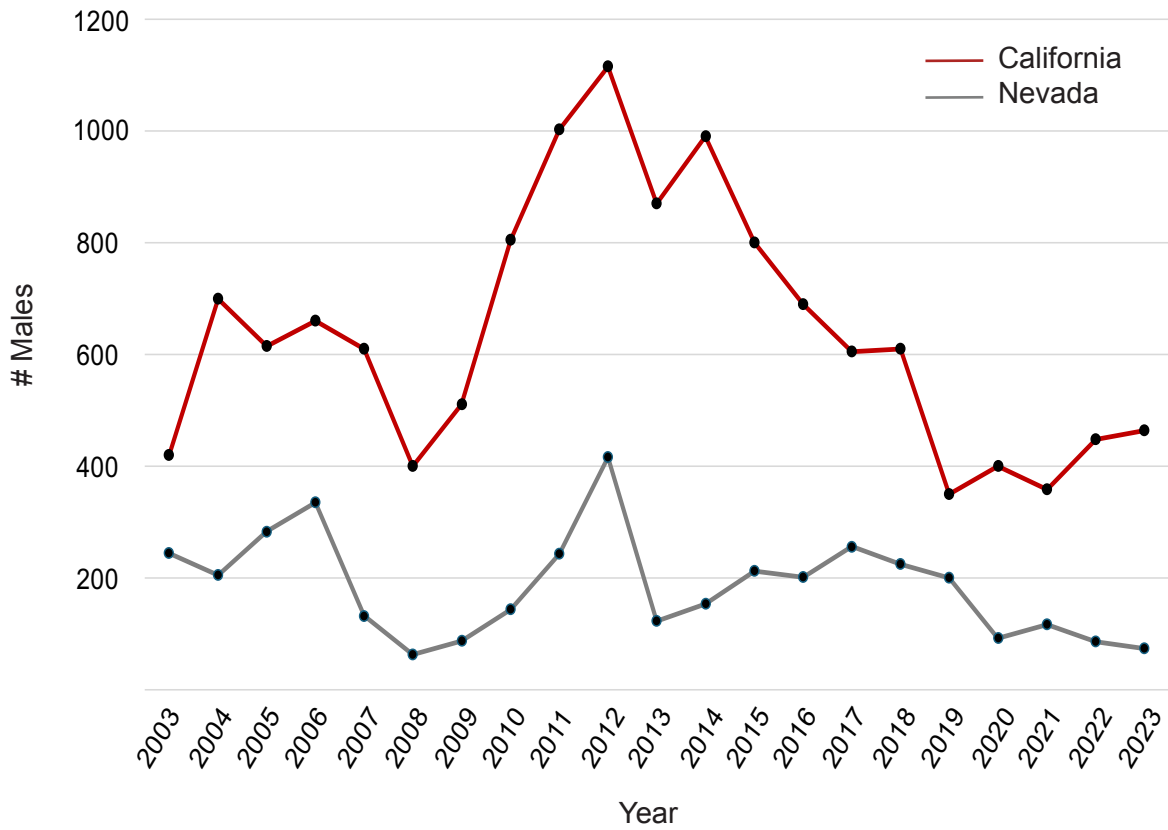
*Sage-grouse nest*



*Lek monitoring*



**Figure 4.** All Known leks in the Bi-State area as of 2021.



**Figure 5.** Bi-State sage-grouse lek attendance trends for the last two decades CA and NV.



*Male sage-grouse at a lekking site. Photo credit: Bob Wick*

## TRENDS, DEMOGRAPHICS & SPACE USE

USGS uses Bi-State monitoring data described above to model population growth, vital rates, and the distribution of Bi-State sage-grouse populations. Monitoring data collected from 2008-2023 was used to model population trends and demographic parameters and is presented in Table 2. Preliminary estimates of population abundance suggest that grouse abundances in the Bi-State DPS were greater in 2022 and 2023 than in 2021 suggesting that the Bi-State DPS may be emerging from a low point in their population cycle. However, additional years of data will be needed to confirm this. Preliminary analysis suggests that the median estimated population abundance for the entire Bi-State DPS was 2,532 in 2021, 3,151 in 2022, and 3,600 in 2023. Median annual survival for adult birds was 56%. For adult hens, median nest survival was 45% and median chick survival was 35%. The median clutch size was approximately 9 eggs. The area inferred to be utilized by sage-grouse, also known as the utilization distribution, was modeled based on data collected between 2011 and 2023.



**Table 2.** Bi-State DPS estimated demographic parameters and 95% credible intervals (CRI)

Year	Median Population Abundance	95% CRI
2021	2,532	1,959 - 3,180
2022	3,151	2,458 - 3,956
2023	3,600	2,792 - 4,547
Median Annual Adult Survival		95% CRI
2022	53%	43% - 65%
2023	56%	49% - 62%
Median Nest Survival		95% CRI
2022	46%	24% - 67%
2023	45%	31% - 58%
Median Chick Survival		95% CRI
2022	31%	24% - 37%
2023	35%	30% - 40%
Median Clutch Size (eggs)		95% CRI
2022	9.06	7.47 - 10.97
2023	9.09	7.84 - 10.68
Median Hatchability		95% CRI
2022	89%	82% - 93%
2023	86%	81% - 91%
Median Chick Survival		95% CRI
2022	31%	25% - 43%
2023	35%	30% - 40%
Surviving Chicks Per Successful Brood (Clutch Size x Hatchability x Chick Survival)		
2022	2.49	-
2023	2.73	-

*\* This information is preliminary or provisional and is subject to revision*





Male sage-grouse on lek. Photo credit: Bob Wick

## LEK COUNTS

Within the entire Bi-State area there are a total of 133 sites at which birds have been observed lekking since the early 1900's (Fig. 3). This total includes historical lek sites, lek sites that are no longer visited due to shifts in the sage-grouse's range, and lek sites that are inconsistently used from year to year because birds may choose to utilize other leks in the same vicinity. There are 52 leks that are classified as either "active" or "pending active" across the Bi-State. Active leks are defined as having two or more males present during lekking season for at least two of the five previously recorded years. Pending active leks are defined as having one observation of at least 2 males in the last 10 years and at least one observation of at least 2 males more than 10 years ago (Connelly et al., 2003).

In 2022, a total of 534 males were counted across 38 of the 69 leks surveyed. Overall Bi-State lek attendance increased by 12% from 2021 to 2022.

2023 was a record setting year for snow in both the CA and NV portions of the Bi-State. Snow persisted well into the spring delaying and, in some cases, completely restricting access to leks by ground surveyors. As a result, lek count numbers for 2023 likely underrepresent true lek attendance. The heavy snowfall also appeared to delay the start of the lekking season for the birds with most high

counts occurring about one month later than was observed in 2022. In 2023, 538 males were counted on 34 of the 53 lek sites surveyed. Overall Bi-State lek attendance increased by 1% from 2022 to 2023.

## California Lek Counts

Lek counts in California are conducted using ground survey methods implemented by CDFW, USFS, USGS, LADWP, BLM, and Mono County. Saturation counts, which involve counting all leks within a breeding complex simultaneously, are used in California. These counts are typically repeated over the course of the breeding season and the peak male count for the year is represented by the saturation count with the highest cumulative number of grouse across all leks. There are a total of 85 identified leks in the California portion of the Bi-State area. The full lek count database for CA is maintained by the California Department of Fish and Wildlife.

In 2022, 49 leks were monitored in the California portion of the Bi-State from March 17th through April 20th. A total of 448 males were observed on 28 of the 49 leks surveyed. Most birds (92%) were observed in the Bodie Hills (60%) and the Long Valley (32%) breeding complexes. 2022 counts represent a 25% increase from 2021 peak counts (358 males).

In 2023, 44 leks were monitored in the California portion of the Bi-State between April 25th and June 1st. A total of 464 males were observed on 26 of the 44 leks surveyed. Most birds (91%) were observed in the Bodie Hills (48%) and the Long Valley (43%) breeding complexes. 2023 counts represent a 1% increase from 2022 peak counts (448 males).



Photo credit: Bob Wick

*Bodie Hills*

In 2022, lek counts occurred in the Bodie Hills PMU between March 17th and April 28th. Birds observed in the Bodie Hills PMU accounted for 48% of all males counted on the California side of the Bi-State and 41% of all males counted in the Bi-State as a whole. A total of 20 leks were surveyed in the Bodie Hills, 13 of which had birds present during the breeding season. Six saturation counts were completed on March 17th, 24th, and 31st, and April 7th, 14th, and 28th. Peak count occurred on April 14th when a total of 266 males were observed on nine leks. This is a 44% increase from 2021 peak count (184 males) and a 39% increase from the long-term average in the Bodie Hills PMU (192 males).

In 2023, lek counts occurred in the Bodie Hills PMU between May 11th and June 1st. Birds observed in the Bodie Hills PMU accounted for 60% of all males counted on the California side of the Bi-State and 50% of all males counted in the Bi-State as a whole. A total of 19 leks were surveyed in the Bodie Hills, 13 of which had birds present during the breeding season. Four saturation counts were completed in the Bodie Hills PMU and took place on May 18th, 26th, and 31st, and June 1st. Peak count occurred on June 1st when a total of 221 males were observed on ten leks. This is a 17% decrease from the 2022 peak count (266 males) and a 15% increase from the long-term average in the Bodie Hills PMU (192 males).



*The Bodie Hills. Photo credit: Bob Wick*

*Fales*

In 2022, five leks were surveyed between March 17th and April 6th. Peak count occurred on April 6th when a total of 22 male birds were observed on three leks. 2022 counts represent a 100% increase from the 2021 peak count for the Fales PMU (11 males).

Due to inaccessibility issues caused by snow in 2023, one lek was surveyed on May 8th and another on May 17th . A total of 25 males were observed between both leks. This represents a 13% increase from the 2022 peak count for the Fales PMU (22 males).

*Long Valley*

In 2022, saturation counts occurred in the Long Valley portion of the South Mono PMU on March 15th, 22nd and 29th and April 5th, 12th, and 19th. Birds were detected on ten of the 20 surveyed leks. Peak count occurred on March 22nd when 143 males were observed on nine leks. 2022 counts represent a 4% increase from 2021 peak count (137 males) and a 34% decrease from the long-term average in the Long Valley breeding complex (216 males).

In 2023, saturation counts occurred in Long Valley on April 25th and May 2nd, 9th, 16th, 23rd, and 30th. Birds were detected on ten of the 22 surveyed leks. Peak count occurred on May 16th when 199 males were observed on eight leks. 2023 counts represent a 39% increase from the 2022 peak count (143 males) and an 8% decrease from the long-term average in the Long Valley breeding complex (216 males).

*Parker Meadow*

There is one known lek in the Parker Meadow sub-population of the South Mono PMU.

In 2022, this lek was surveyed on March 18th and 25th, and April 15th. Peak count was observed on April 15th when 15 males were counted. Results this year represent a 25% increase from the 2021 peak count (12 males).

In 2023, the Parker Meadow sub-population was surveyed on May 12th, 17th and 25th. Peak count was observed on May 17th when 22 males were



*Long Valley*

### *South Mono*

No additional leks in the South Mono PMU were surveyed outside of the Long Valley and Parker Meadows areas during the 2022 and 2023 lek seasons.

### *White Mountains, California*

Because many leks in the White Mountains PMU are remote in nature and difficult to access, saturation cannot be carried out.

In 2022, three leks were surveyed on April 20th in the California portion of the White Mountains PMU. Two males were observed on one of the three leks surveyed. 2022 counts represent an 86% decrease from 2021 peak count (14 males).

Lek counts were not completed in the California portion of the White Mountains PMU in 2023 due to heavy snow which made lek sites inaccessible.

### **Nevada Lek Counts**

Lek counts in the Nevada portion of the Bi-State were conducted by NDOW, USFS, BLM, USGS, and volunteers using on-the-ground survey methods. Because many leks in Nevada are remote in nature and difficult to access, saturation counts are not attempted. There are a total of 48 identified leks in the Nevada portion of the Bi-State area. The full lek count database for Nevada is maintained by the Nevada Department of Wildlife.

In 2022, 20 leks were surveyed and a total of 86 males were observed across 10 leks. The largest number of males were observed at the Pine Grove lek in the Desert Creek PMU (n=25). The average peak male attendance for NV Bi-State leks on which males were observed in 2022 was 8.6 males per lek, up from the average peak male attendance of 8.3 males per lek in 2021.

In 2023, 9 leks were surveyed and a total of 74 males were observed across 8 leks. The largest number of males were observed at the Pine Grove lek in the Desert Creek PMU (n = 28). The average peak male attendance for NV Bi-State leks on which males were observed in 2023 was 9.25 males per lek, an increase from the 2022 average peak male attendance of 8.6 males per lek.

### *Pine Nuts*

There are 13 known lek locations in the Pine Nut PMU with one lek classified as active and three leks classified as pending active status.

In 2022, three leks were surveyed by helicopter on April 13th and no males were observed. This represents no change from the 2021 average peak male attendance.

In 2023, five leks were surveyed by helicopter on April 10th and no males were observed. This represents no change from the 2022 average peak male attendance.



*White Mountains*

### *Mount Grant*

There are 15 known lek sites in the Mount Grant PMU, consisting of six active and three pending active leks.

In 2022, 11 leks were surveyed. A total of 18 males were documented on two leks for an average of 9 males per lek. This is an increase from 2021 average peak male attendance of 3.75 males per lek.

In 2023, three leks were surveyed. A total of five males were documented on two leks for an average peak male attendance of 2.5 males per lek. This is a decrease from the 2022 average peak male attendance of nine males per lek.

### *Desert Creek*

There are 16 known lek sites within the Desert Creek PMU including nine active leks and two pending active status leks.

In 2022, nine leks were surveyed. A total of 68 males were documented on eight leks for an average peak male attendance of 8.5 males per lek. This is a decrease from 2021's peak average attendance of 10.2 males per lek.

In 2023, six leks were surveyed. A total of 69 males were documented on six leks for an average peak attendance rate of 11.5 males per lek. This is an increase from 2022's average peak male attendance rate of 8.5 males per lek.

### *White Mountains, Nevada*

There are two known lek locations in the Nevada portion of the White Mountains PMU. However neither are considered active. No leks were surveyed in 2022 or 2023.



*Common Raven*

### **RAVEN MONITORING**

Raven predation is a direct cause of sage-grouse mortality and poses a particular problem in locations where food subsidies from humans have led to greater predator abundances than could naturally be sustained on the landscape. USGS has been surveying for ravens at sage-grouse monitoring sites to understand the extent to which raven predation may pose a risk to Bi-State sage-grouse populations.

In 2022 and 2023, USGS surveyed ravens in the Bodie Hills PMU, Parker Meadows and Long Valley in the South Mono PMU, the northern and southern portions of the White Mountains PMU, and the Mount Grant PMU.

In 2022, a total of 615 surveys were conducted across all sites (Bodie Hills = 238 sites; Parker Meadows = 61 sites; Long Valley = 167 sites; Mount Grant = 125 sites; northern White Mountains = 9 sites; southern White Mountains = 140 sites). At Mount Grant, Bodie Hills, and Parker Meadows ravens were detected at 8% - 13% of surveyed sites with a median of 1- 2 ravens per survey. In Long Valley, ravens were detected at 34% of survey sites with a median of 1 raven per survey. In the northern White Mountains, no ravens were detected at any of the survey sites. In the southern White Mountains, ravens were detected at 5% of sites with a median of one raven per site. Overall, raven detection in surveys in which livestock were also detected was higher than surveys in which no livestock were detected (Table 3; USGS, Preliminary Results).



**Table 3.** Total surveys conducted, number of ravens detected per survey and the mean number of raven detections per survey for surveys on which livestock were and were not present.

Year	Field Site	Total Surveys	Raven detections per survey	Raven detections per survey when livestock are present	Raven detections per survey when livestock are absent
2022	Bodie Hills	238	0.07	0.00	0.07
2022	Parker Meadows	61	0.08	NA	0.08
2022	Long Valley	167	0.34	0.63	0.32
2022	White Mountains, South	140	0.05	NA	0.05
2022	White Mountains, North	9	0.00	NA	0.00
<b>TOTAL 2022</b>		<b>615</b>			
2023	Mount Grant	129	0.16	0.20	0.15
2023	Bodie Hills	274	0.14	0.57	0.13
2023	Parker Meadows	54	0.13	NA	0.13
2023	Long Valley	180	0.25	0.69	0.19
2023	White Mountains, South	116	0.10	0.00	0.10
2023	White Mountains, North	13	0.00	NA	0.00
<b>TOTAL 2023</b>		<b>766</b>			

\* This information is preliminary or provisional and is subject to revision

In 2023, a total of 766 surveys were conducted across all sites (Bodie Hills = 274 sites; Parker Meadows = 54 sites; Long Valley = 180 sites; Mount Grant = 129 sites; northern White Mountains = 13 sites; southern White Mountains = 116 sites). At Mount Grant, Bodie Hills, and Parker Meadows ravens were detected at 22% - 26% of surveyed sites with a median of one raven per survey. In Long Valley, ravens were detected at 45% of survey sites with a median of one raven per survey. Ravens were detected at 38% of the survey sites in the northern White Mountains with a median of 2.5 ravens per site. In the southern White Mountains, ravens were detected at 15% of sites with a median of one raven per site. Overall, raven detection in surveys in which livestock were also detected was higher than surveys in which no livestock were detected (Table 3; USGS, Preliminary Results).

### PARKER MEADOW TRANSLOCATION

Parker Meadow translocation efforts began in 2017 to increase the population size and genetic diversity of the Parker Meadows sage-grouse population. Since 2017, a total of 46 females and 275 chicks have been translocated from Bodie Hills to Parker Meadows in the South Mono PMU (Fig.3). In 2022, 9 females and 66 chicks were translocated. In 2023, 9 females and 60 chicks were translocated. Over the full seven-year period during which translocations occurred apparent chick survival in translocated

broods was 32% while apparent chick survival in broods that were not translocated was 33% (USGS, Preliminary Results). These results suggest that the translocation itself did not have a significant impact on chick survival and that brood translocation is an efficient tool to increase reproduction at sites suffering from negative impacts associated with small population sizes. Two manuscripts detailing this work have been accepted for publication (Meyerpeter et al. 2021, Meyerpeter et al. *In Press*).

### VEGETATION MONITORING

In 2011, the Nevada Partners for Conservation and Development (NPCD), housed within the Nevada Department of Wildlife (NDOW), initiated a long-term habitat restoration and monitoring project across the Bi-State to quantify the effects of conifer removal and fire restoration treatments on overall habitat health. By establishing and comparing plots that have been subjected to conifer treatment or fire restoration practices to untreated control plots, Bi-State partners are able to determine the effectiveness of these management techniques in restoring sage-grouse habitat.

In 2022 and 2023 plot monitoring was conducted by NDOW. In 2022, no sites were monitored. In 2023, 35 sites burned by the Tamarack Fire which took place in 2021 were sampled. Data collected in 2023 has not yet been analyzed.



*Sage-grouse. Photo credit: Bob Wick*

## CONSERVATION ACTIONS

Over the course of 2022 and 2023, Bi-State partners worked collaboratively to implement conservation and management actions to address the following threats to the sage-grouse and its habitat:

- Wildfire
- Urbanization
- Conifer expansion
- Loss of sagebrush/meadows
- Invasive species
- Infrastructure
- Human disturbance
- Wild horse grazing
- Permitted livestock
- Predation

The following pages outline actions completed to address these threats as well as actions taken to implement a coordinated interagency approach and maintain stakeholder involvement.

## WILDFIRE

As with most of the western United States, wildfires are increasing in both size and frequency in the Bi-State area. The threat level associated with wildfire was identified as high in the 2012 Action Plan for the Pine Nut, Desert Creek-Fales, Mt. Grant, Bodie and

South Mono PMUs. The increased risk of wildfires in sage-brush ecosystems is driven by a combination of climate change and increasing fuel loads due to the expansion of conifers and invasion of non-native weeds (Coates et al., 2017; Reinhardt et al., 2017; Severson et al., 2016; Howe et al., 2014; Baruch-Mordo et al., 2013). Furthermore, once a fire occurs, it can lead to alterations in the fire cycle that further exacerbate the threat (Brooks et al., 2004). This is because wildfire disturbance increases the susceptibility of the landscape to invasion by non-native plant species. When invasive species are able to colonize an area at high rates, sagebrush ecosystems are at risk of being converted to monocultures of annual grasses or other flammable non-native plants. Consequently, this altered fire regime continues to perpetuate the loss of sagebrush ecosystems.



*Post-fire landscape, dominated by cheatgrass*

In 2022 and 2023, the following actions were implemented to address the threat of wildfire in the Bi-State:

- The Humboldt-Toiyabe National Forest carried out fuel reduction work on 9,000 acres of sagebrush habitat at the Marine Mountain Warfare Training Center in the Desert Creek/Fales PMU.
- 21 acres of handwork were conducted to reduce fuels at Mill Canyon in the Desert Creek/Fales PMU by the Humboldt-Toiyabe National Forest.
- The Bishop BLM office completed a NEPA analysis required to initiate a fuels reduction project on Conway Ranch in the Bodie Hills PMU.



*Bodie Hills. Photo credit: Bob Wick*

## URBANIZATION

Maintaining high quality and non-fragmented sage-grouse habitat was identified as high priority in the 2012 Action Plan for the Desert Creek-Fales, Pine Nut and South Mono PMUs.

In areas where urbanization is a concern conservation easements and land acquisitions are effective mitigation strategies. Conservation easements are voluntary but legally binding agreements between a landowner and a qualified organization, such as a land trust, which place some restrictions on the use of a property to protect its natural values. These agreements provide benefits to both landowners and wildlife because they protect large quantities of suitable habitat from further development and allow landowners to pursue funding to implement

conservation projects on their land. Land purchases or exchanges by public, state or federal entities can also protect sage-brush ecosystems by ensuring that land remains minimally developed and is managed to conserve the Bi-State sage-grouse.

The following projects were completed in 2022 and 2023 to address the threat of urban development and habitat loss in the Bi-State:

- The Wilderness Land Trust acquired 880 acres on the south side of the Mt. Biedeman Wilderness Study Area in the Bodie Hills PMU.
- The Eastern Sierra Land Trust established the 1,741-acre Centennial Point Ranch Conservation Easement in Bridgeport Valley. Funding partners included the California Strategic Growth Council’s Sustainable Agricultural Lands Conservation Program, the Wildlife Conservation Board, and the USDA Natural Resources Conservation Service.
- The Eastern Sierra Land Trust established 1,228-acre Desert Creek Ranch Conservation Easement with cooperative funding from USDA’s Natural Resources Conservation Service, and the Nevada Department of Wildlife.
- The Wildlife Conservancy acquired the 2,333-acres Bentley Junction Ranch property with funding from the California Department of Fish and Wildlife.
- Bishop BLM acquired nearly 1,700 acres of inholdings throughout the Bodie Hills. These are now part of public lands managed by the Bishop Field Office.



*Long Valley*

## CONIFER EXPANSION

In the 2012 Action Plan, conifer expansion into sagebrush ecosystems was identified as high priority threat in the Pine Nut, Desert Creek-Fales, Mount Grant, Bodie Hills, and White Mountains PMUs. Conifer expansion reduces available nesting habitat, decreases habitat connectivity, provides perches for predators, increases behavioral avoidance, reduces the availability and quality of mesic habitats, and increases fuel loads and fire risks (Reinhardt et al, 2017; Severson et al., 2016; Howe et al. 2014; Baruch-Mordo et al. 2013). Over the last decade Bi-State partners have addressed many of the areas prioritized for conifer removal. As a result, conifer removal projects completed in 2022 and 2023 have primarily focused on maintaining previous treatments.

In 2022 and 2023, the following actions were completed to address the threat of conifer expansion into sagebrush ecosystems as well as improve the health of conifer woodlands adjacent to sagebrush ecosystems:

- 913 acres of conifer treatment were maintained at east Walker in the Desert Creek/Fales PMU by the Humboldt-Toiyabe National Forest.
- 1,676 acres of conifer treatment was completed in the Pine Nut PMU by the Sierra Front BLM.
- 538 acres of conifer treatment was completed in the Pine Nut PMU by the Natural Resources Conservation Service, Nevada and their partners.
- 1,933 acres of conifer treatment were completed at Rancheria Springs in Bodie Hills PMU by the Bishop BLM.
- 370 acres of conifer treatment were completed in the Bodie Hills PMU by Natural Resources Conservation Service, NV and their partners.
- 300 acres of conifer treatment were completed at Sagehen Summit on Inyo National Forest Land in the South Mono PMU.
- Bishop BLM completed the NEPA planning for the Mono Lake Kutzadika'a Pinyon Stewardship Project to improve fire resilience.



*Conifer removal at Upper Rancheria*



*Mono Lake Kutzadika'a tribal council members, Bishop-BLM staff and the BLM State Director visit the Pinyon Stewardship Project site.*



*Upper Rancheria Pinyon Stewardship Project area*



*Planted sage-brush*

## LOSS OF SAGEBRUSH AND WET MEADOW HABITATS

In addition to sagebrush ecosystems sage-grouse also rely on wet meadows, streams and springs. These mesic habitats are an especially important component of late-brood rearing and summer habitat for sage-grouse. As with wildfire, loss of sage-grouse habitat is driven by a variety of factors including drought due to climate change, degradation by horses and livestock, and conifer expansion.

The following projects were completed in 2022 and 2023 to improve sage-grouse habitat in the Bi-State:

- The Los Angeles Department of Water and Power continued to implement its Adaptive Management Plan to protect brood-rearing habitat in irrigated meadows. Work completed included providing surface water to enhance/maintain sage grouse brood rearing habitat in Long Valley.
- Let-down, exclosure fencing was constructed by Bishop BLM to protect mesic resources near the South Fork Aurora Canyon in the Bodie Hills PMU.
- Sagebrush seedlings from Mono County seed sources, grown at the Carson City Correctional Facility through the Sagebrush in Prison program were planted across 15 acres of the Mountain View Fire burn area on BLM land managed by the Bishop Field Office.
- Bishop BLM carried out periodic irrigation of Kirkwood Meadows took place in the Bodie Hills PMU.

- 75 acres of habitat improvement was completed at Nine Mile Ranch by Nevada State Parks.
- Wind fences were maintained, and sagebrush and perennial grasses were planted within the “dead zone” of the Indian Fire in the South Mono PMU by Bishop BLM to promote native plant regrowth.

## INVASIVE SPECIES

Invasion by non-native plants have direct negative impacts on sagebrush ecosystems. Cheatgrass is of particular concern because it modifies the sagebrush fire regime leading to more frequent fires (Brooks et al. 2004). In the 2012 Action Plan, the threat associated with cheatgrass invasion was identified as a high priority threat in the Pine Nuts PMU and a moderate threat in the Desert Creek/Fales and Mount Grant PMU.

In 2022 and 2023, the following projects were completed to address the spread of non-native and invasive plant species:

- 605 acres of the noxious weed, medusa head, were treated in the Desert Creek/Fales PMU where approximately 300 acres of land were treated in 2022 and the same area was re-treated again in 2023.
- 58 acres of weed treatment were carried out in the Bodie Hills PMU.
- Previous weed treatments in Aurora Canyon were maintained in the Bodie Hills PMU by the Bishop BLM.
- Weed treatment was carried out on one acre of land in the South Mono PMU.



*Volunteers after a day of weed removal*



*Sage-grouse crossing sign in the White Mountains PMU*

## INFRASTRUCTURE

Infrastructure such as facilities, roads, powerlines and fences negatively impact sage-grouse in a number of ways including destroying or fragmenting habitat, increasing the risk of death when sage-grouse strike fences or when cars strike sage-grouse, increasing the presence of humans and providing perches and subsidies for avian predators (O’Neil et al., 2018, Howe et al., 2014; Weichman, 2008; Stevens et al., 2012; Gelbard & Belnap, 2003).

The following action was implemented in 2022 and 2023 to address the threat of infrastructure:

- The Benton Crossing Landfill was closed.
- 4.6 miles of fencing was marked in the Humboldt-Toiyabe National Forest’s Bridgeport Ranger District.
- 0.6 miles of fencing in Long Valley was converted to let-down fencing by Bishop BLM.
- 5.6 miles of fencing was marked on land managed by the Humboldt-Toiyabe National Forest in the Desert Creek/Fales PMU.

## HUMAN DISTURBANCE

Humans can pose a threat when their recreational activities disturb sage-grouse and/or degrade their habitat (Holloran, 2005; Boyle & Samson, 1985; Paterson, 1952). Recreational activities of concern include but are not limited to dispersed camping, hiking, the presence of off-leash dogs, and OHV use. In the 2012 Action Plan, impacts associated with recreation were identified as a high threat in the Pine Nut and South Mono PMUs.

The following action was implemented in 2022 and 2023 to address the threat of human disturbance:

- Climbing rangers monitored areas in the South Mono PMU for illegal vehicle use in prohibited areas and provided education and outreach to recreational users.
- Sage-grouse crossing sign was erected on Inyo National Forest land in the White Mountains PMU to reduce the risk of vehicle strikes.

## WILD HORSE GRAZING

In the 2012 Action Plan, grazing by wild horses and burros is listed as a moderate threat in the Pine Nut, Mount Grant, and White Mountains PMUs and a low priority threat in the Bodie Hills and South Mono PMUs. However, in recent years some wild horse herds have grown larger than their recommended management limit and/or are expanding outside of their established territories.

In 2022 and 2023, the following actions were completed to address the habitat degradation associated with wild horse grazing:

- Bishop BLM and the Inyo National Forest are working together to conduct NEPA planning necessary to relocate wild horses that are outside of the Montgomery Pass Wild Horse Territory
- USGS monitored wildhorses as part of their common raven, raptor, free-roaming horse and livestock surveys

## PERMITTED LIVESTOCK

The grazing of permitted livestock is listed as a low priority threat for all PMUs in the 2012 Action Plan. Land management agencies work with permittees to ensure that livestock does not negatively impact grouse habitat, and that the terms and conditions of grazing leases are met.

To address the threat of habitat degradation caused by grazing the following actions were completed in 2022 and 2023:

- 16,000 acres of Humboldt-Toiyabe National Forest Land was not converted to cattle grazing after analysis suggested that it would have detrimental impacts for riparian areas and threatened species





*2024 Action Plan Mount Grant & Bodie Hills PMU Meeting*

**COLLABORATIVE CONSERVATION**

Each year actions are completed to ensure a coordinated, interagency approach and maintain stakeholder involvement.

In 2022 and 2023 accomplishments on this front included:

- Hiring of the new Bi-State Sage-Grouse Data and Communications Coordinator
- Sage-grouse presentation for the Los Angeles Audubon Society
- Educational field trips for Eastern Sierra Audubon, Eastern Sierra Land Trust and the Bi-State Tribal Natural Resources Committee to view lekking sage-grouse.
- Wildlife Biologist participation at the Eastern Sierra Land Trust field day to teach attendees about Bi-State sage-grouse conservation and biology.
- Regular meeting of the Technical Advisory Committee and the Executive Oversight Committees

**DEVELOPMENT OF THE 2024 ACTION PLAN**

Bi-State partners are also in the process of actively developing the 2024 Action Plan to guide the next 10 years of Bi-State sage-grouse conservation. To this end, partners have been working diligently to ensure that stakeholder involvement is maintained throughout the process and that the plan is being updated using a coordinated inter-agency approach. Major efforts on this front include:

The development and implementation of a communications campaign to inform stakeholders of the Action Plan update process, upcoming meetings, and instructions for submitting feedback and comments. Communications included:

- Flyer distribution via post and email to all BLM and USFS permittees in the Bi-State area
- Personal letters and invites to all Bi-State Tribes
- Coordination with the Bi-State Natural Resources Committee to conduct additional personal outreach to Tribal leadership.
- Announcements to the Local Area Working Group



- Information dissemination via local news outlets and community social media platforms
- Amplification of outreach to private stakeholders through email lists hosted by the four NRCS field offices in the Bi-State region, local Conservation Districts, and local NGOs.
- EPA Regional Tribal Operations Committee, Nevada Workgroup Meeting
- Mono County Collaborative Planning Team Meeting
- Walker Basin Workgroup Meeting

Hosting outreach events for stakeholders to receive updates and share feedback on threats and priorities for the 2024 Action Plan. In-person meetings and additional communications included:

- Pine Nuts & Desert Creek-Fales PMUs meeting in Smith Valley, NV
- Mount Grant & Bodie Hills PMUs Meeting in Bridgeport, CA
- South Mono PMU Meeting in Lee Vining, CA
- White Mountains PMU Meeting in Dyer, NV
- Full Bi-State Local Area Working Group Meeting
- Bi-State Tribal Natural Resources Committee Meeting
- Bi-State Inter-Tribal Meeting (Convened by the Bi-State Tribal Natural Resources Committee and Hosted by the Washoe Tribe of CA & NV)

- 27 personal interviews
- Seven online survey submissions.

Technical Advisory Committee members with oversight from the Executive Oversight Committee collaboratively developed a first draft of the 2024 Action Plan. The updated plan integrates the results from USGS analyses, stakeholder feedback, and the on-the-ground knowledge of local biologists and technical experts. Meetings held to accomplish this work included:

- 10 population management unit work group meetings
- 2 full day Technical Advisory Committee working meetings
- 3 Executive Oversight Committee meetings



*Action Plan update meeting*

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