Bi-State Sage-Grouse
10-Year Accomplishment Report
2012-2021

BISTATESAGEGROUSE.COM

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

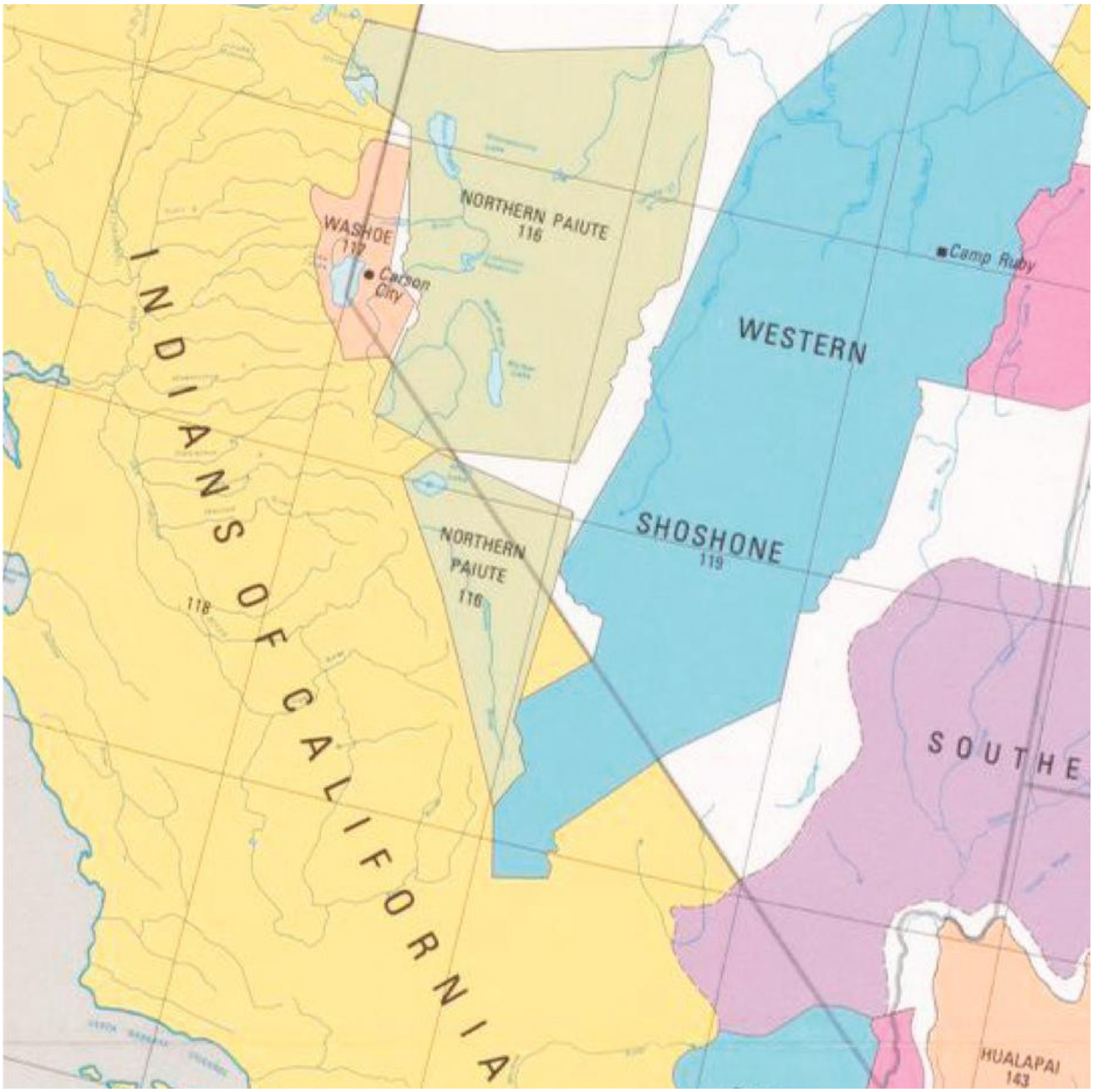


Figure 1: Ancestral lands of the Bi-State area (map source: Indian Claims Commission)

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 the generations to come.

CONSERVATION HISTORY

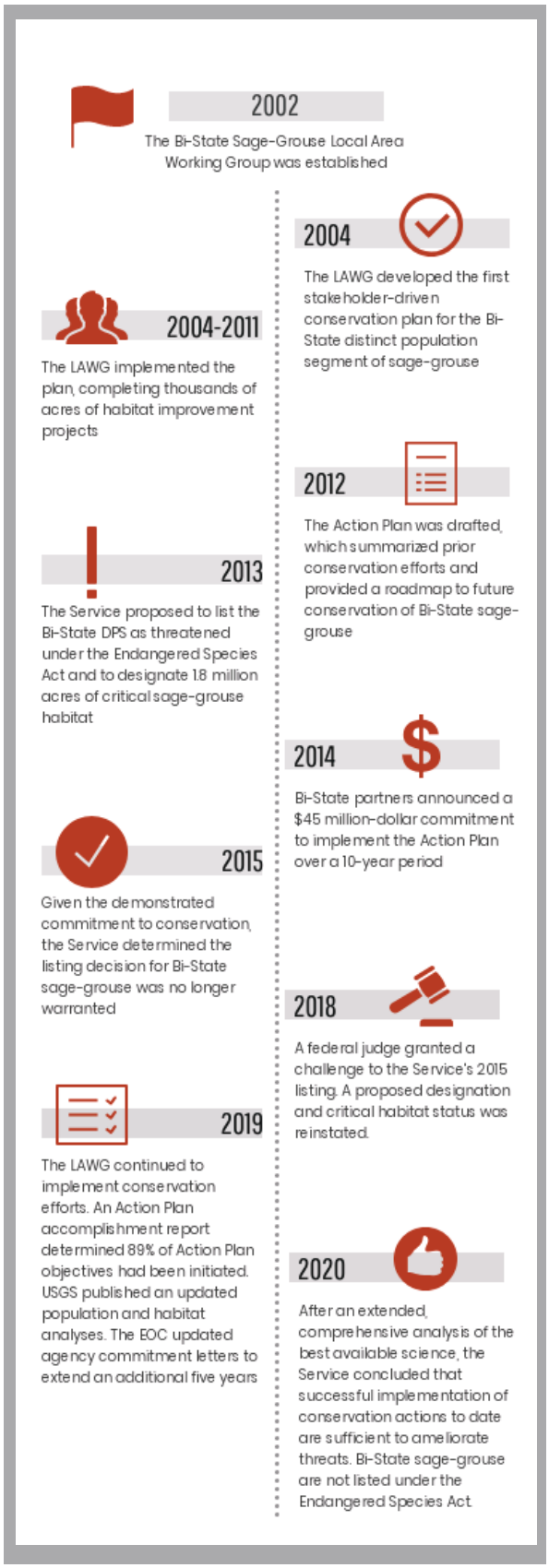


Figure 2: Timeline of Bi-State conservation efforts and USFWS listing decisions




Bi-State sage-grouse, habitat, and people

EXECUTIVE SUMMARY

The Bi-State Sage-Grouse Conservation Action Plan was written in 2012 to provide a roadmap to conservation for the Bi-State greater sage-grouse distinct population segment (Bi-State DPS). The Bi-State area, located along the California and Nevada state border, is divided into six Population Management Units (PMUs) (Figure 4). In each PMU, threats were identified and ranked, and unique conservation strategies were created to address threats (Table 3). The Action Plan called out priority actions deemed necessary to protect sage-grouse populations and their habitats. Projects in the Action Plan sought 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,
- and maintain stakeholder involvement.

At every step it was assumed that projects would be altered or added as priorities change based on new information, and new priorities occur that were unknown when the Action Plan was written.

Action Plan strategies and objectives are implemented through the Bi-State Local Area Working Group (Bi-State LAWG), a collaborative conservation network of federal, state, and local government agencies, Native American tribal members and representatives, nonprofits organizations, and private landowners.

The Bi-State LAWG receives guidance from a team of agency scientists and biologists that make up the Technical Advisory Committee (TAC), as well as support from agency directors and leadership that make up the Executive Oversight Committee (EOC). Each year projects outlined in the Action Plan are implemented utilizing a science-based adaptive management and collaborative conservation approach. In 2014, agency partners announced a $45 million dollar commitment to implement the Action Plan over a 10-year period.

The purpose of this report is to provide a 10-year summary of Bi-State Action Plan implementation which includes population monitoring, vegetation monitoring, and the implementation of a wide variety of habitat improvement projects. Understanding Action Plan implementation and the effectiveness of conservation actions will help Bi-State partners to prioritize future conservation actions for Bi-State sage-grouse.

ACCOMPLISHMENTS

Much has been accomplished since the implementation of the Action Plan in 2012 (Figure 3). Bi-State partnerships remain strong and active and the Action Plan, while flexible, remains the guiding framework for Bi-State conservation efforts. Additionally, partners are well on their way to meeting the $45 million dollar funding commitment established in 2014. To date, approximately 84% of that funding has been allocated with a total of $37.6 million dollars spent on sage-grouse conservation efforts over the last eight years.

The objectives, strategies, and actions outlined in the Action Plan include population monitoring, habitat monitoring, and the implementation of a wide variety of conservation actions to maintain healthy sage-grouse populations and habitat in the Bi-State conservation planning area. Population monitoring includes sage-grouse capture, intensive monitoring of survival, nest success, and brood success, and annual lek monitoring. The collection of these data provides information on habitat selection and utilization as well as factors influencing sage-grouse population trends. Vegetation monitoring efforts aim to evaluate habitat quality and the effectiveness of completed conservation actions including post-fire restoration and conifer treatment. Finally, Action Plan directed conservation projects are carried out to address the following threats to Bi-State sage-grouse and their habitats:

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

Since 2012, 945 sage-grouse have been captured and fitted with very high frequency (VHF) or Global Positioning System (GPS) transmitters across all Bi-State Population Management Units (PMUs) (Table 2, Figure 6). Population monitoring has occurred through annual lek counts and through the tracking of marked birds to better understand survival, reproduction, and recruitment. Vegetation monitoring has been completed at 816 sites to measure vegetation response to habitat improvement projects including changes in sagebrush cover, perennial grass cover, species richness and presence of non-native and invasive species. A total of 141 of the 159 actions identified in the Action Plan have been implemented. These projects have improved habitat conditions for sage-grouse on more than 143,000 acres of land in the Bi-State.

Over the last ten years, the Action Plan has provided a clear framework to guide this collaborative conservation effort. It has helped the Bi-State LAWG increase their understanding of sage-grouse population trends, gain a better understanding of factors influencing populations, and learn how and where to implement conservation actions to provide the greatest benefit to sage-grouse and their habitats. Recent USGS research suggests the implementation of the Action Plan has bolstered Bi-State sage-grouse populations by 3.9% annually and 31.1% since 2012 (Bi-State TAC, 2022). Bi-State partners are currently evaluating the most recent science and working to update the Action Plan so that it may continue to act as a guiding document for sage-grouse related conservation efforts in the Bi-State.

Bi-State sage-grouse

Bi-State partners

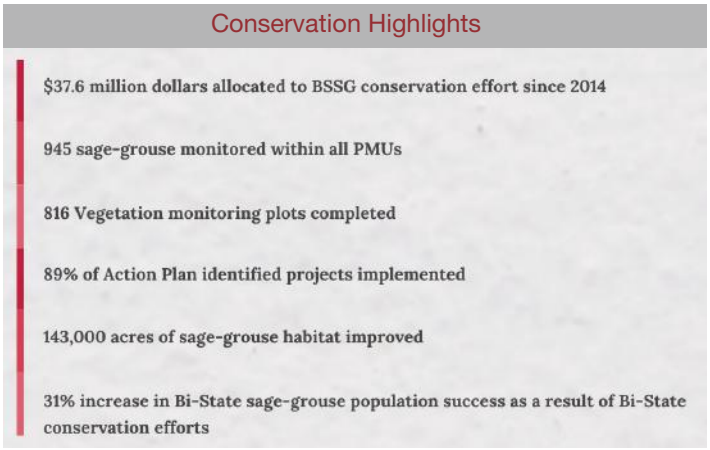


Figure 3: Bi-State highlights

Bi-State sage-grouse on lek

INTRODUCTION

The Bi-State Local Area Working Group (Bi-State LAWG) was formed in 2002 to establish a landscape-level approach to conservation and management of the Bi-State greater sage-grouse distinct population segment (Bi-State DPS). This diverse group of stakeholders includes, federal, state, and local government agencies, Tribal members and representatives, non-profit organizations, and private landowners.

This group has been striving to implement a collaborative approach to sage-grouse conservation and management for twenty years and has been lauded nationally as a model of collaborative conservation success. Together they developed the first Bi-State sage-grouse conservation plan in 2004. In 2012, the Bi-State LAWG organized a planning and strategy approach to build and improve upon the multi-pronged effort to affect the conservation of the Bi-State DPS. While an important milestone, it was not the beginning of the Bi-State LAWG's effort but a continuation of efforts that began a decade before.

Encouraged by a potential listing of the species under the Endangered Species Act, the Bi-State LAWG set out to evaluate threats to Bi-State sage-grouse and identify tangible on-the-ground actions to alleviate these concerns. This effort culminated in the 2012 Bi-State Conservation Action Plan (Action Plan), which provided a 10-year adaptable scope of work, grounded in the best available science, and supported by funding commitments provided by local, state, and federal agency partners. The Action Plan summarized relevant threats and prior conservation efforts and outlined a comprehensive set of strategies, objectives, and actions designed to achieve conservation of sustainable populations and habitats for the Bi-State DPS (Bi-State TAC, 2012).

Each year projects outlined in the Action Plan are implemented utilizing a science-based adaptive management and collaborative conservation approach. Understanding Action Plan implementation and the effectiveness of conservation actions will help Bi-State partners to update the Action Plan and prioritize future conservation actions for Bi-State sage-grouse. The purpose of this report is to provide a 10-year summary of Bi-State Action Plan implementation which includes population monitoring, vegetation monitoring, and the implementation of a wide variety of habitat improvement and conservation projects.

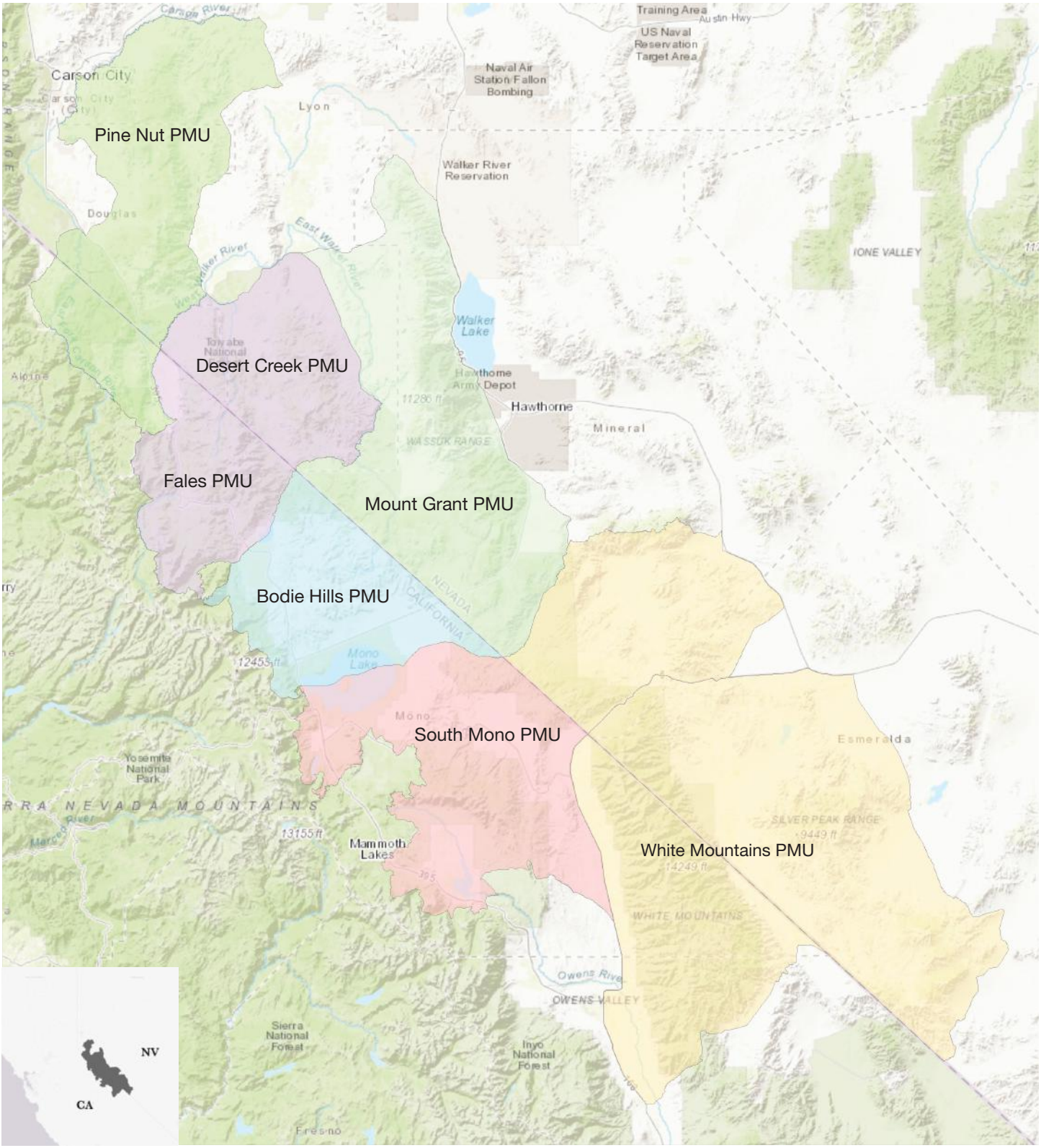


Figure 4: Bi-State Population Management Units

Bi-State sage-grouse capture and monitoring

POPULATION MONITORING

There are six Population Management Units (PMUs) within the Bi-State, including the Bodie Hills, Desert Creek/Fales, Mount Grant, Pine Nut, South Mono and White Mountains (Figure 4). Research and monitoring projects detailed in the Action Plan include telemetry, habitat and vital rate data collection, and the coordination of annual lek counts to better understand population demographics and improve predictive models and adaptive management capabilities.

Monitoring efforts were in place in 2012 when the Action Plan was written but a cooperative plan to intensively monitor sage-grouse populations was initiated during the fall of 2015. This monitoring plan allows partners to identify long-term population trends, understand key habitat characteristics, and ultimately allows for a before and after study design to quantify sage-grouse response to management actions (Table 1).

Since 2012, 945 sage-grouse have been captured in the spring and fall seasons and fitted with Very High Frequency (VHF) collars or Global Positioning Satellite (GPS) transmitters (Table 2, Figure 6). Sage-grouse movement and survival is tracked in consecutive years. Intensive monitoring is conducted during nesting and brood-rearing periods to track reproduction and recruitment (Mathews et al., 2018). These vital rates provide data for the Integrated Population Model (IPM) which can characterize population growth rate and isolate factors affecting that rate for individual sub-populations and the Bi-State DPS.

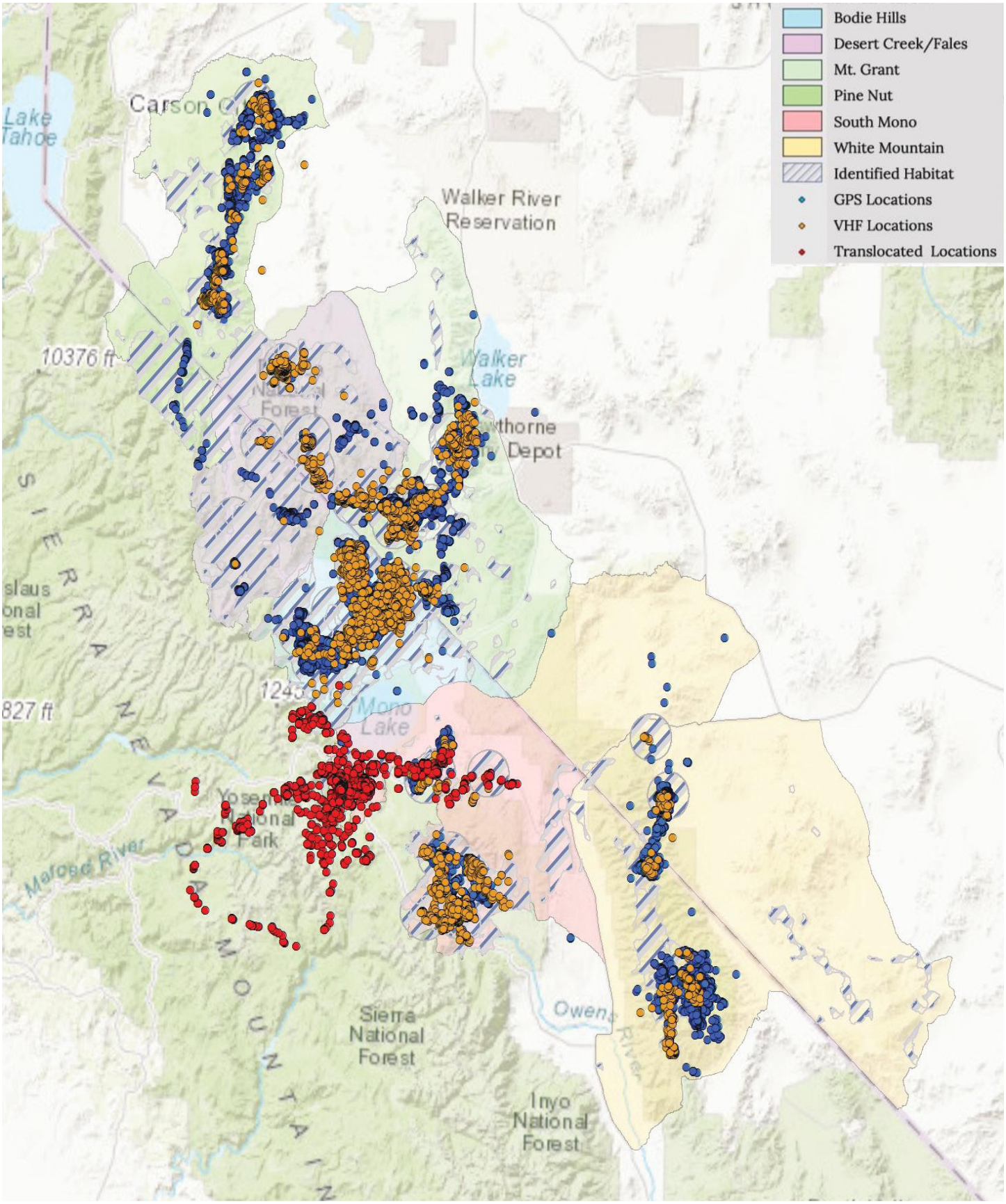


Figure 5: Bi-State sage-grouse locations and identified habitat

PMU	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Pine Nut	●	●	●	●						
Desert Creek-Fales	●			●	●	●	●			
Bodie Hills	●	●	●	●	●	●	●	●	●	●
Mount Grant	●	●	●	●	●	●	●			●
South Mono			●	●	●	●	●	●	●	●
Parker Meadows *	●				●	●	●	●		●
White Mountains		●			●	●	●	●	●	●

Table 1: Bi-State monitoring schedule
** South Mono PMU*

PMU	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Mount Grant	20	10	1	14	32	27	18			23	145
Desert Creek-Fales	6			12	31	20	10				79
Pine Nut	39	14	9	3							65
South Mono			9	39	12	33	26	11	9	33	172
Parker Meadows *	5				2	28	20	20		5	80
White Mountains		2			4	23	46	26	28	22	151
Bodie Hills	2	1	9	29	14	60	51	35	26	26	253
Bi-State Total	72	27	28	97	95	191	171	92	63	109	945

Table 2 Number of sage-grouse captured and marked each year within each Population Management Unit in the Bi-State.
** Birds were captured in Bodie Hills PMU and translocated to Parker Meadows (South Mono PMU)*

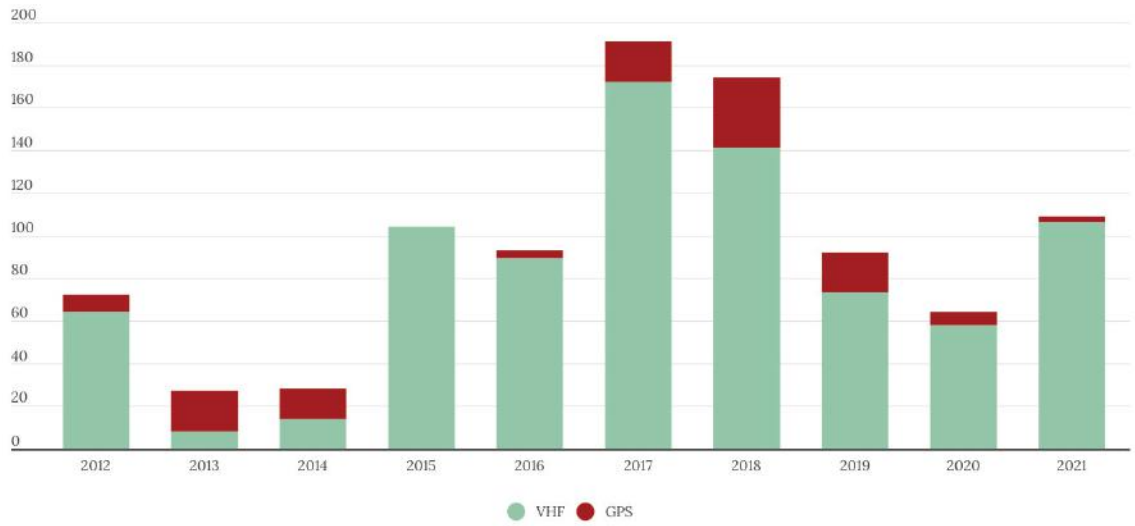


Figure 6: Sage-grouse marked annually by collar type

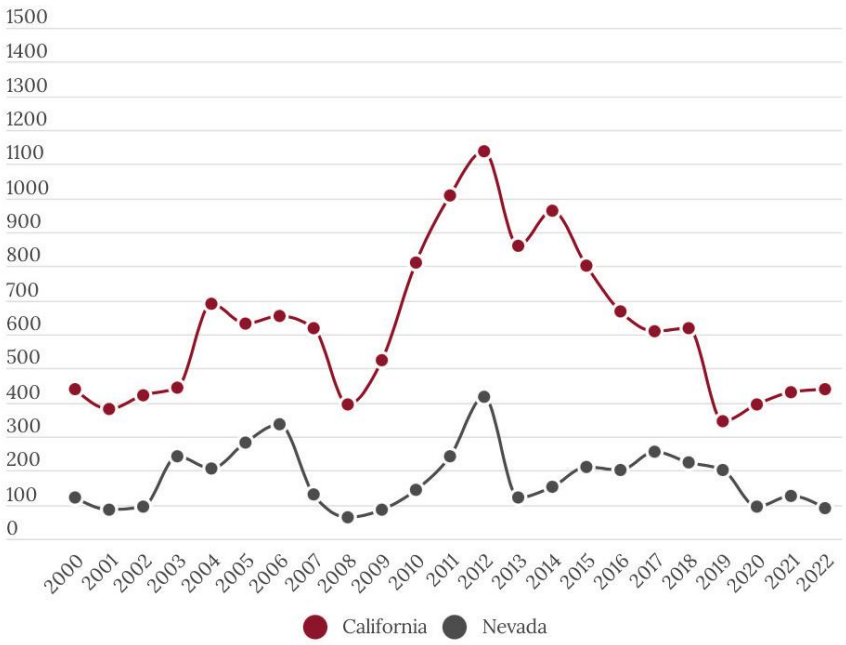


Figure 7: Bi-State sage-grouse lek attendance trends

LEK MONITORING

Each spring, between the months of March and May, Bi-State partners collaborate to monitor known leks to count sage-grouse when they congregate and visibly display on lekking grounds. These counts generate annual population estimates which help Bi-State partners understand population trends over time. These population trends are cyclical and count results fluctuate year to year. To determine long-term trends, annual lek count data is incorporated into an Integrated Population Model which accounts for low counts or leks not counted and generates modeled population estimates.

Within the Bi-State area, there are a total of 101 documented lek locations between California and Nevada, of which 49 are considered currently active (Figure 8) . The active lek status is defined by two or more males present for at least two of five recorded years (Connelly et al., 2003). The total number of documented leks may be somewhat misleading due to the presence of "satellite leks" within many of the PMUs. Satellite leks are small leks that often occur near larger active leks during years of relatively high abundance. The "active" definition is sometimes difficult to apply to satellite leks that are utilized sporadically and do not persist each year. State agencies including NDOW and CDFW are currently working on delineating satellite leks as autonomous or connected, thereby removing some uncertainty surrounding lek counts as an index of population change.

CALIFORNIA LEK SURVEYS

California sage-grouse lek counts are conducted by CDFW, USFS, USGS, LADWP, BLM, Mono County, and others. The primary method used to obtain lek count data in California involves saturation counts which is the simultaneous survey of all leks within a breeding complex on a minimum of three separate days spaced throughout the survey period. The peak male count is represented by the survey having the highest cumulative number of grouse counted on all leks within a breeding complex on any one day.

NEVADA LEK SURVEYS

Lek counts in the Nevada portion of the Bi-State are conducted by NDOW, USFS, BLM, USGS personnel, and volunteers using on-the-ground survey and aerial survey methods. Because many leks in Nevada are remote in nature and difficult to access, saturation counts are not attempted. Lek counts are attempted at all known active leks multiple times during the lekking season, and the highest recorded number of males is documented as the annual count. Remote leks are often surveyed aerially by helicopter.

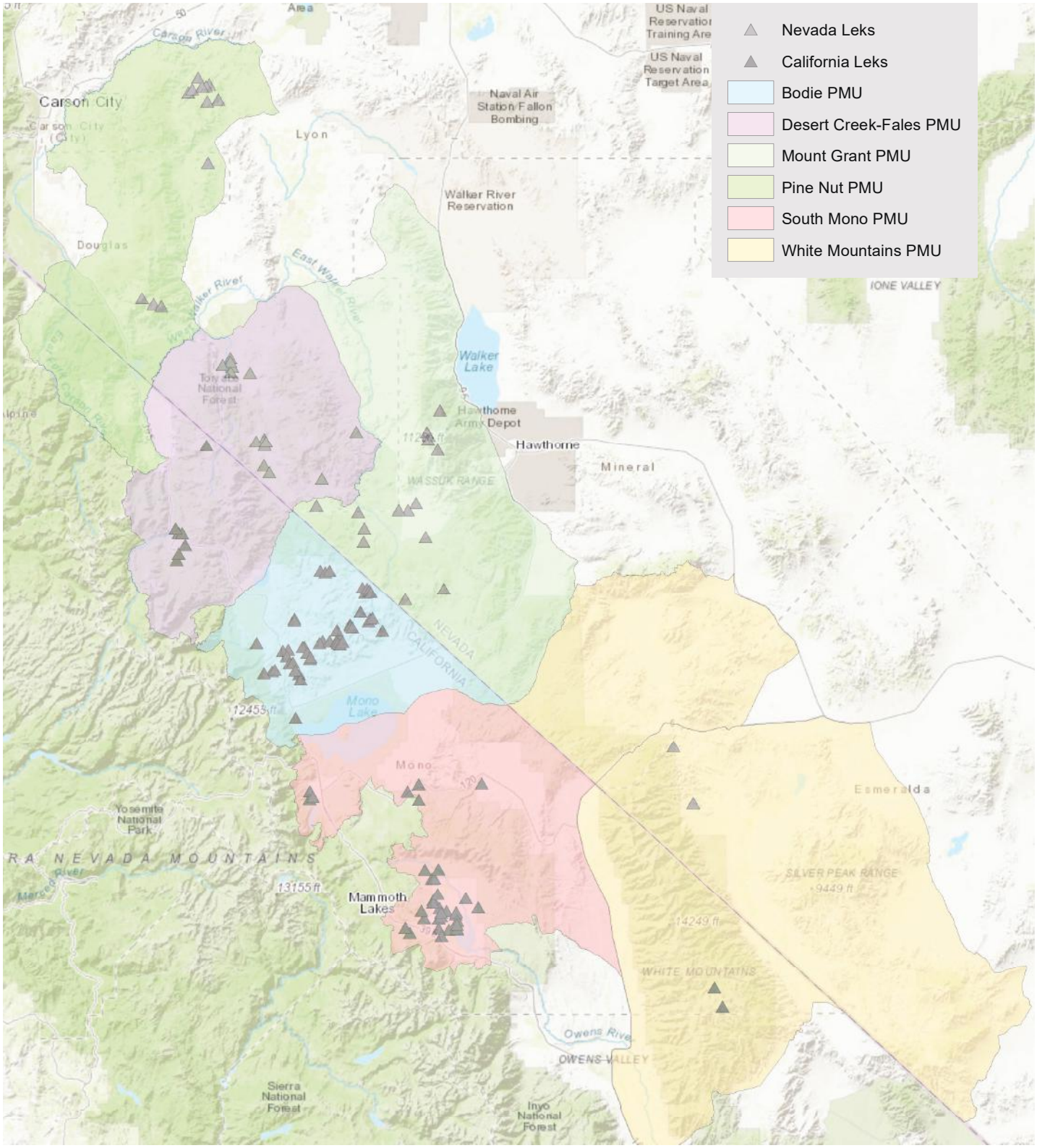


Figure 8: Known Bi-State lek locations

POPULATION MANAGEMENT UNIT SUMMARY

Sage-grouse population trends are cyclical and typically mirror climatic conditions. During periods of adequate moisture, sage-grouse populations often do well, while periods of drought bring population declines (Blomberg, 2012). The five-year period between 2012 and 2016 saw extreme drought conditions, with record-high temperatures and record-low snow pack and precipitation (Gleick, 2017). Since 2012, there have only been two years that California reached or surpassed long-term average precipitation levels and sage-grouse population trends have reflected this. (Figure 9). The following PMU sections summarize scientific research modeled by USGS' IPM. The population demographic descriptions that follow are for the reporting period between 2012 and 2021. They are heavily influenced by recent climactic conditions and do not accurately represent long-term population trends in the Bi-State.

PINE NUT

The Pine Nut PMU is in the northernmost region of the Bi-State. This area contains 574,373 acres of BLM, USFS, Tribal, private, and state or county managed lands (Bi-State Action Plan, 2012). This population of sage-grouse is relatively isolated from the rest of the Bi-State and with population estimates of 48 birds it is the smallest in the Bi-State area (Coates, 2022). Monitoring efforts took place from 2012 through 2015. Over that time 109 birds were captured, marked, and monitored for survival, nest, and brood success. Monitoring efforts were planned to initiate again in 2020 but halted due to concerns around capturing birds within such a small population.

The greatest threats to sage-grouse populations and their habitats in the Pine Nut PMU are wildfire, conifer encroachment, invasive species, recreational use impacts, infrastructure, and energy development (Table 3). Examples of completed conservation actions to address identified threats include:

- 11,704 acres of post-wildfire restoration
- 20,837 acres of conifer expansion treatment
- 838 acres of invasive species monitoring and removal
- 651 acres of meadow restoration and improvement
- 14.8 miles of fence removal and fence marking
- 3 wild horse gathers to maintain AML
- 4 projects to improve livestock grazing management
- 7 education and outreach events

Since 2012, sage-grouse populations in the Pine Nut PMU have been in decline. The likelihood that this population will become extirpated within the next ten years is 67.7% (Coates, 2019). Drought, wildfire, and wild horse impacts have all played a role in limiting habitat and reproductive success. Telemetry data between 2013 and 2015 indicates that some birds have moved from the Pine Nuts to the Bodie Hills PMU (Coates et al., 2016). Considering the Pine Nut subpopulation only makes up approximately 1% of the entire Bi-State population, changes in the overall total of birds in this area will not have great effects on the Bi-State as a whole, however, loss of population distribution is concerning (Coates, 2019).

	Pine Nut	Desert Creek/ Fales	Bodie Hills	Mount Grant	South Mono	White Mtns.
Wildfire	high	high	high	high	high	moderate
Conifer Encroachment	high	high	high	high	moderate	high
Invasive Species	high	low	low	moderate	low	low
Sagebrush Habitat Conditions		moderate				
Urbanization	high	high	moderate		high	moderate
Human Disturbance & Recreation	high	moderate	low	low	high	moderate
Infrastructure	high	high	moderate	high	moderate	low
Landfill					high	
Surface Water Management					moderate	
Licensed Hunting					low	
Poaching						
Grazing-Wild Horses	moderate		low	moderate	low	moderate
Grazing-Permitted Livestock	low	low	low	low	low	low
Predation	moderate	moderate	low	low	low	low
Disease		moderate				
Energy Development	high				low	low
Wind Energy Testing	low					
Geothermal Development			low	high	low	

low moderate high

Table 3: Identified threats to sage-grouse by PMU

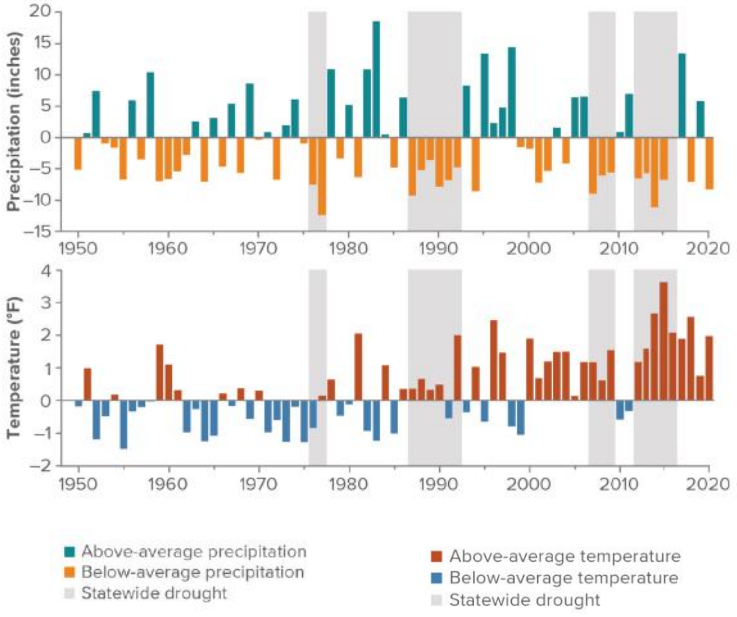


Figure 9: California drought and temperature data (Source: Western Regional Climate Center California Climate Tracker)

DESERT CREEK-FALES

The Desert Creek subpopulation is on the Nevada side of the Bi-State and is bordered to the west by the Fales subpopulation in California. These subpopulations are managed as one PMU. The Desert Creek-Fales PMU contains 567,992 acres of USFS, private, BLM, state or country, and Department of Defense managed lands (Bi-State Action Plan, 2012). IPM population estimates for Desert Creek total 237 birds while Fales is estimated at 88 (Coates, 2022). Monitoring in Desert Creek occurred in 2012 and between 2015 through 2018. During that time 79 birds were captured, marked, and monitored for survival, nest success, and brood success.

The greatest threats to sage-grouse populations and their habitats in the Desert Creek-Fales PMU are urbanization, conifer encroachment, wildfire, and infrastructure (Table 3). Examples of completed conservation actions to address identified threats include:

- 6,578 acres protected through conservation easements
- 21,016 acres of conifer expansion treatment
- 26 miles of fence marking
- 218 acres of sagebrush and meadow restoration
- 453 acres of invasive species removal
- 6 projects to improve livestock grazing management
- 1 education and outreach event

Since 2012, sage-grouse populations in the Desert Creek-Fales PMU have been in a slight decline. The most recent IPM estimates suggest that decline to be 4.5% annually (Coates, 2019). The ten-year extirpation estimates were 23.4% for Desert Creek and 38.4% for Fales (Coates, 2019). Sage-grouse in Desert Creek are located in lower elevation, drier habitats. Impacts from drought have likely caused these declines. However, recent lek counts suggest that sage-grouse numbers have been improving in the Fales PMU.

BODIE HILLS

The Bodie Hills PMU is west of the Mount Grant PMU on the California side of the Bi-State. It contains 349,630 acres of BLM, USFS, private, state, county, and Tribal lands (Bi-State Action Plan, 2012). This subpopulation is the largest in the Bi-State. Recent IPM estimates suggest there are 819 birds in the Bodie Hills PMU, which represents 36.6 percent of all sage-grouse within the Bi-State DPS (Coates, 2022). The Bodie Hills are higher in elevation compared to the rest of the Bi-State and habitat and bird populations tend to fare better during periods of drought as a result. Because the Bodie Hills subpopulation accounts for the bulk of population abundance, Bodie Hills PMU trends substantially influence overall trends across the Bi-State DPS (Coates, 2022). Capture and monitoring in the Bodie Hills occurred between 2012 and 2021. During that time 253 birds were collared and monitored for survival, nest success, and brood success.

Bodie Hills PMU in spring

The greatest threats to sage-grouse populations and their habitats in the Bodie Hills PMU are wildfire and conifer encroachment (Table 3). Examples of completed conservation actions to address identified threats include:

- 825 acres of post-wildfire restoration
- 7,713 acres of conifer expansion treatment
- 1,690 acres of sagebrush and meadow restoration
- 32 miles of fence removal, modification, and marking
- 11,624 acres protected through conservation easements
- 170 acres of invasive species removal
- Annual monitoring of the Montgomery Pass wild horse herd
- 32 projects to improve livestock grazing management
- 3 education and outreach events

In 2012, sage-grouse populations were at an all-time high in the Bodie Hills PMU. Since then, coincident with a long period of drought, populations have declined slightly but population estimates in the Bodie Hills PMU still remain four times higher than they were two decades ago (Coates, 2019). The IPM estimates the likelihood of ten-year extirpation to be low at 2.4% (Coates, 2019). The Bodie Hills PMU is higher in elevation relative to other Bi-State PMUs and can withstand the effects of drought longer than other lower elevation sites (Coates, 2019). Bodie Hills also contains a relatively large amount of late brood-rearing habitat in the Bi-State, which has led to higher recruitment rates for this reporting period (Coates, 2019).

Sage-grouse in Long Valley meadow

MOUNT GRANT

The Mount Grant PMU is east of the Bodie Hills on the Nevada side of the Bi-State. This area contains 699,079 acres of USFS, BLM, Department of Defense, private, and Tribal managed lands (Bi-State Action Plan 2012). IPM estimates suggest there are 230 sage-grouse in the Mount Grant PMU (Coates, 2022). Capture and monitoring in Mount Grant occurred between 2012 and 2018, and in 2021. During that time 145 birds were captured and monitored for survival, nest, and brood success.

The greatest threats to sage-grouse populations and their habitats in the Mount Grant PMU are wildfire, conifer encroachment, infrastructure, mineral exploration and development, and energy development (Table 3). Examples of completed conservation actions to address identified threats include:

- 1,562 acres of post-wildfire restoration
- 8,862 acres of conifer expansion treatment
- 60 acres of sagebrush and meadow restoration
- 47 sites monitored to assess meadow conditions
- 26 miles of fence marking
- 2,607 acres of invasive species monitoring and removal
- 1 wild horse gather to maintain AML
- 2 projects to improve permitted livestock grazing management
- 3 projects to limit recreational use impacts
- 2 education and outreach events

Between 2012 and 2018, sage-grouse populations in the Mount Grant PMU remained very close to stable. Since 2019 there have been sharper declines in male lek attendance, which is likely a result of long-term drought in the higher elevations of the Mount Grant PMU. USGS has documented movement of birds from Mount Grant to the Bodie Hills PMU. The IPM estimates the likelihood of ten-year extirpation to be moderate at 24.6% (Coates, 2019). More intensive monitoring of this population will begin in 2022, which may provide more understanding of the demographic rates associated with population declines.

SOUTH MONO

The South Mono PMU contains 579,483 acres of BLM, USFS, private, county, and Tribal managed lands (Bi-State Action Plan, 2012). This subpopulation is the second largest in the Bi-State and includes the Parker Meadows, Sagehen, and Long Valley subpopulations. Recent IPM estimates suggest there are 769 birds in the South Mono PMU, the majority of which utilize the Long Valley area (Coates, 2022). As of spring 2021, the Long Valley subpopulation represents 31 percent of all sage-grouse within the Bi-State DPS. Because of its large size, population changes at Long Valley have large impacts on the overall Bi-State DPS trends (Coates, 2022). Capture and monitoring in the Sagehen subpopulation occurred in 2014 and 2015. Capture and monitoring in the Parker Meadows subpopulation occurred in 2012 and between 2017-2021. Capture and monitoring in the Long Valley subpopulation occurred from 2015 to 2021. During that time a total of 250 birds were collared and monitored for survival, nest success, and brood success.

The greatest threats to sage-grouse populations and their habitats in the South Mono PMU are wildfire, infrastructure, recreation and human disturbance, and urbanization (Table 3). Examples of completed conservation actions to address identified threats include:

- 2,926 acres of post-wildfire restoration
- Progress has been made to close the Benton Crossing landfill by 2023
- 1,246 acres of seasonal road closures to limit recreational use impacts during lekking season
- 52.8 miles of permanent road closures in critical sage-grouse habitat
- 2,305 acres protected through conservation easements
- 5.7 miles of fence removal, modification, and marking
- 6,275 acres of conifer expansion treatment
- Implementation of LADWP's Adaptive Management Plan for watering in Long Valley
- Raven monitoring and egg oiling efforts to reduce predation impacts
- 5 acres of invasive weed treatment
- 4 projects to improve permitted livestock grazing management
- 16 education and outreach events

The South Mono population has experienced slight declines over the reporting period likely associated with drought, predation, and high levels of recreational activity in the Long Valley area.

White Mountain PMU

Sage-grouse and pronghorn

The 10-year extirpation probability remained low at 3.8 %. Birds in the Long Valley portion of the South Mono PMU rely heavily on wet meadows and irrigated pastures near Crowley Lake during nesting and brood rearing periods. During long periods of drought, birds may venture further out in those irrigated pastures with little overhead protection from avian predators (Coates, 2022). Although the effect of outdoor recreation pressure on sage-grouse has not been quantified, recreational use has increased significantly over the reporting period and may be affecting habitat selection patterns (Coates, 2022). Birds in the Sagehen area have sharply declined, it is presumed that they have joined the core population in the Long Valley area during the drought period. Birds in the Parker Meadows area have experienced a large increase after experimental translocation efforts were implemented between 2017 and 2021 (see translocation section).

WHITE MOUNTAINS

The White Mountains PMU is the highest elevation sage-grouse habitat in the Bi-State area and contains 1,753,875 acres of BLM, USFS, and privately managed lands (Bi-State Action Plan, 2012). Recent IPM estimates suggest there are 40 birds in this population (Coates, 2022). However, the White Mountains are remote and difficult to access in the spring, sage-grouse in the PMU have not been extensively monitored, and historic lek count data is lacking. Therefore, the IPM should be interpreted with caution as bird numbers could be much higher than the model suggests (Coates, 2022). Capture and monitoring efforts took place in 2013, 2015 and from 2017 to 2021. During that period 196 birds were collared and monitored for survival, nest success, and brood success.

The greatest threats to sage-grouse populations and their habitats in the White Mountains PMU are conifer expansion and wild horses (Table 3). Examples of completed conservation actions to address identified threats include:

- TAC members evaluated 5 conifer treatment sites
- Monitoring of White Mountain and Silver Peak wild horse herds
- Coordinated management of Crooked Creek grazing allotment
- 1.7 miles of fence marking
- 4 education and outreach events

Sage-grouse in the White Mountains were relatively understudied, largely because these sage-grouse reside at high elevations that are often inaccessible until mid-summer. The subpopulation represents the most southwestern, and potentially highest elevation occupancy of greater sage-grouse across the species range, representing a unique and potentially extreme study site. Thus, less is known about this population compared to other Bi-State populations (Coates, 2022). Capture and monitoring efforts will continue in an effort to increase understanding of demographic rates and population trends in the White Mountains PMU.

Parker Meadow brood translocation

PARKER MEADOW TRANSLOCATION

One management action specifically listed in the Action Plan was the addition of birds, through translocation, from other PMUs to critically small and isolated sub-populations of sage-grouse. Translocations are designed to: 1) bolster population size to reduce the eminent likelihood of local extinction that would negatively impact the overall stability and persistence of the DPS; and 2) infuse genetic variation to 'rescue' this population from the harmful effects of low genetic diversity within the subpopulation.

Ongoing research conducted by the USGS highlighted the potential for population declines within the Parker Meadow subpopulation in the South Mono PMU to critically low levels. It was determined that intervening management efforts were necessary to maintain and increase the Parker Meadow subpopulation.

After three years of planning, the first of a multi-year translocation effort began in March 2017. That year, 28 sage-grouse (20 females, 8 males) were captured at Bodie Hills and translocated to Parker Meadows. All captured birds were fitted with VHF or GPS (male only) transmitters. As part of an experimental design, a subset of females was artificially inseminated prior to release to help increase the probability of nest initiation that spring. Additionally, three post-hatch broods, females with newly hatched chicks, were translocated. These were the first greater sage-grouse brood translocations attempted range-wide. The expectation is that these reproductive conditions would help "anchor" the female to the release area, and their surviving chicks would add new recruits to the population at Parker Meadows.

Data from 2017 efforts suggested that brood translocations are more successful because they bypass the effects of low nest initiation and success associated with the translocation of pre-nesting females. In 2018, 20 more sage-grouse (13 females, 7 males) were translocated from Bodie Hills to Parker Meadows, five of which were pre-nesting hens and eight were females with broods. In 2019, a total of 20 birds (10 females with broods, 5 pre-nesting females, 5 males) were translocated from the Bodie Hills PMU. Fifteen were outfitted with VHF transmitters and 5 with GPS transmitters to track movement and monitor survival. No translocations took place in 2020 due to the covid-19 pandemic. In 2021, five hens with their broods were translocated to Parker Meadows.

Given what has been learned during the initial years of translocation efforts, measures have been identified to minimize morality and dispersal rates. Design changes to transport boxes and increasing the emphasis on brood translocations promise to reduce the number of individuals required to be handled and improve success of the translocation overall (Figure 10). Moving forward USGS will be using a new protocol that involves mixed brood translocations, where one hen is translocated with her brood and part of another hen's brood. The purpose of this method is to limit the number of adults removed from the source population, decreasing negative demographic impacts to that population. The translocation effort in Parker Meadows will continue in the coming years. Changes to protocols and methods will continue to utilize a science based, adaptive approach to allow this effort to be as successful as possible.

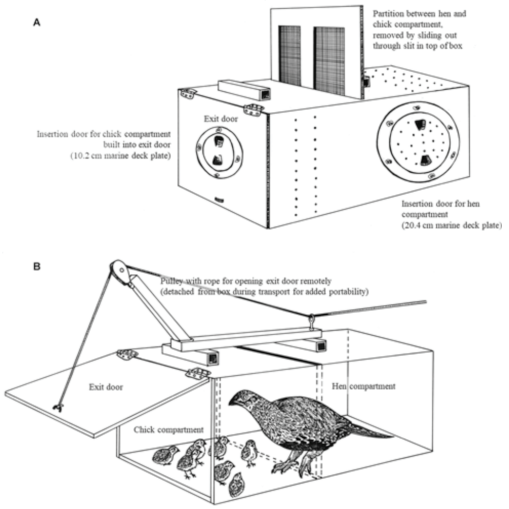


Figure 10: Schematic of translocation release boxes. IIlustration credit: Diana Muñoz

	2017	2018	2019	2020	2021	Total
Males	8	7	5	_	_	20
Females (pre-nesting)	17	5	5	_	_	27
Females (w/ broods)	3	8	10	_	5	26
Chicks	17	39	70	_	20	146
Total	45	59	90	0	25	219

Table 4: Sage-grouse translocated to Parker Meadows annually

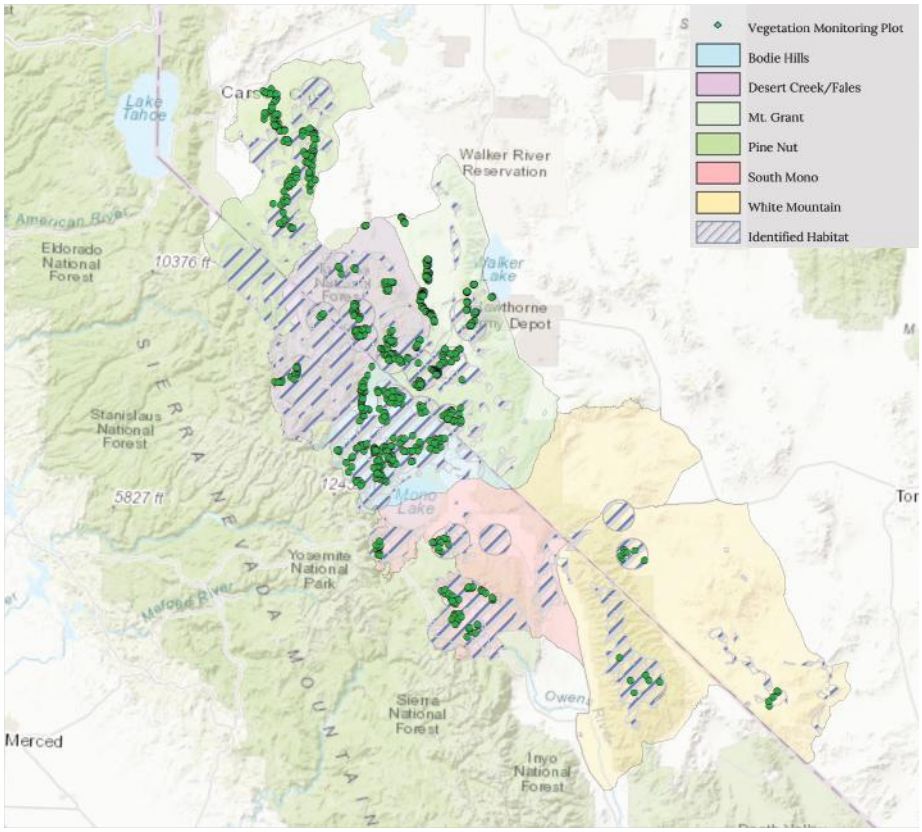


Figure 11: Vegetation monitoring plot locations

VEGETATION MONITORING

The Nevada Partners for Conservation and Development (NPCD), housed within the Nevada Department of Wildlife (NDOW), has been collecting vegetation data across numerous sites across all Bi-State PMUs since 2011.

In areas identified for conifer removal and at sites that have experienced episodes of wildfire, the NPCD establishes monitoring plots both within and outside of treatment and wildfire boundaries. Sampling is conducted prior to treatment to establish baseline conditions and sites are revisited post treatment to determine treatment and fire restoration effectiveness. Plots outside of treatment and wildfire boundaries serve as controls against which the restoration projects' effectiveness can be compared. The methods NPCD employs are consistent with the BLM's Assessment, Inventory and Monitoring protocols (AIM; Taylor et al. 2014) and are designed to be easily replicated, requiring little or no expensive equipment.

Since the Action Plan was implemented, 816 vegetation plots have been monitored across the Bi-State. Monitoring measures vegetation response to treatment including changes in sagebrush cover, perennial grass cover, species richness and presence of non-native and invasive species (Figure 12). Vegetation response to treatment is often slow; however, preliminary results from selected sites suggest that species richness, sagebrush, perennial grass, and forb cover are elevated in treatment plots compared to control sites. These results suggest that conifer treatment and post wildfire restoration efforts are improving habitat conditions for sage-grouse.

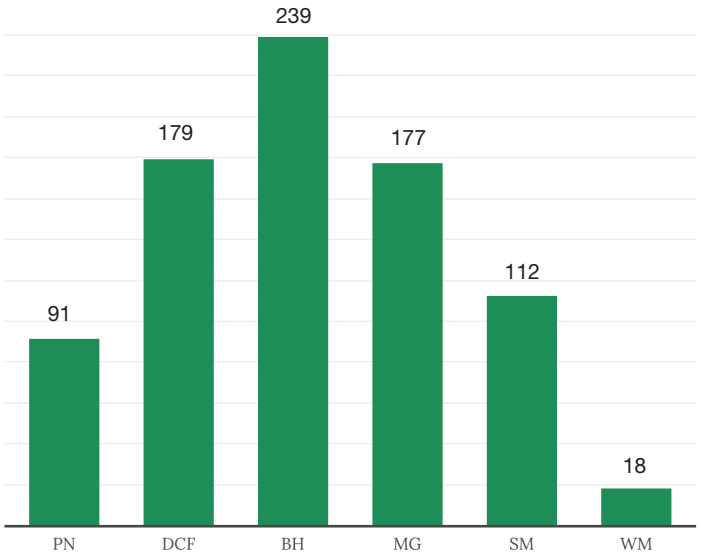


Figure 12: Completed vegetation monitoring plots

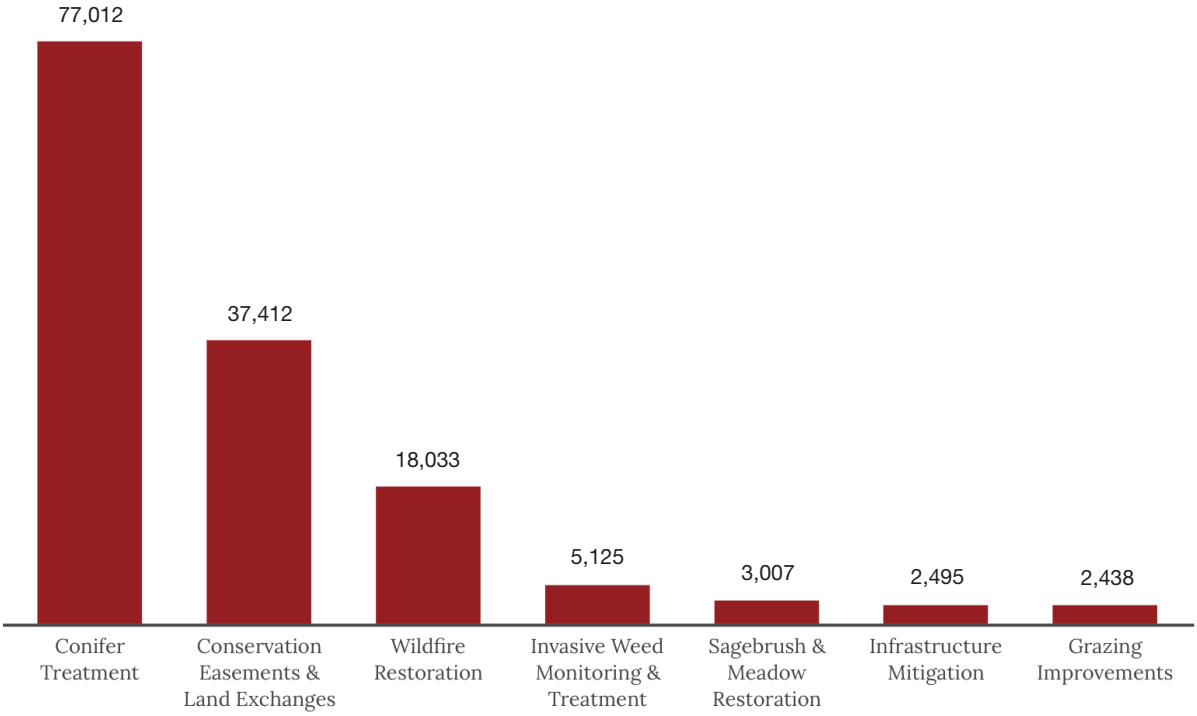


Figure 13: Acres of work completed to address identified threats to Bi-State sage-grouse

CONSERVATION ACTION IMPLEMENTATION

The Action Plan intended to provide a foundation and vision for a coordinated and cooperative management approach for conservation of the Bi-State sage-grouse, to ensure healthy population levels, and to maintain and improve sage-grouse habitat.

Individual objectives, strategies, and actions outlined in the Plan provide a strategic framework designed to achieve these overall conservation goals. Conservation actions are outlined using a hierarchal approach that identifies each action relative to the broader conservation objectives and strategies identified in the Plan (Bi-State Action Plan, 2012). The highest priority threats were identified and prioritized for each individual PMU.

In the last ten years, on-the-ground conservation efforts have been initiated to improve habitat conditions on more than 143,000 acres in the Bi-State (Figure 13). The following pages identify threats to Bi-State sage-grouse and their habitats and detail actions taken to address those threats. Work completed represents the highest priority actions in the Bi-State informed by research, a conservation planning tool developed by USGS, input from the Bi-State Local Area Working Group, and common-sense realities of implementing projects.

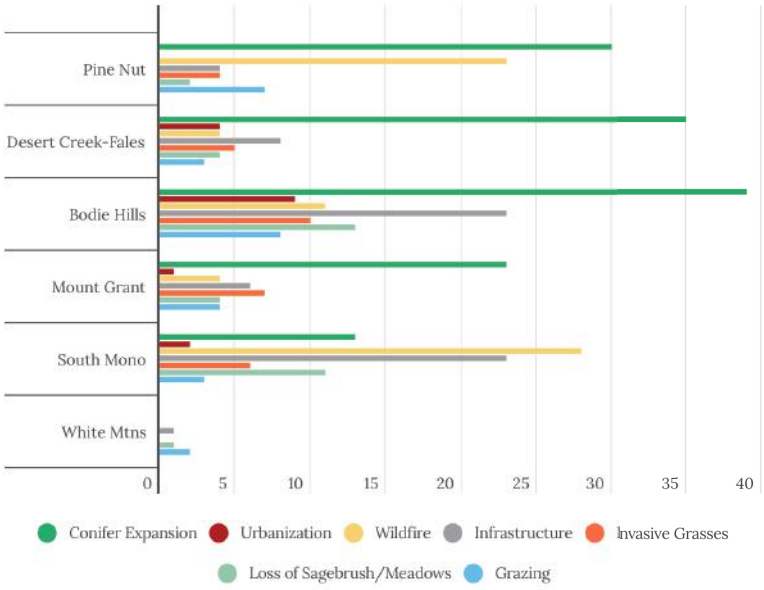


Figure 14: Number of completed projects by PMU

Post fire conifer removal

Wind fencing to improve soil stabilization

WILDFIRE

Large, intense wildfires are an increasing issue across the West and the Bi-State is not immune to this threat. Addressing wildfire is identified as a high priority in the Pine Nut, Desert Creek-Fales, Mt. Grant, Bodie and South Mono PMUs.

Changing climate, periods of drought, encroaching conifer, and the proliferation of non-native weeds, such as cheatgrass, alter sagebrush ecosystems and increase the likelihood of ignition and fuel load available for wildfire that can quickly devastate large expanses of important sage-grouse habitat.

A disturbed ecosystem post-fire is more susceptible to further invasion of non-native plant species and conversion of sagebrush to annual grass monocultures, which in turn increases potential for fire. This cycle alters fire regimes, causing more frequent and intense fires that perpetuate loss of habitat and threats to sage-grouse. Actions employed to address the threat of wildfire include, strategic fire suppression, fuel breaks, conifer removal, fuel reduction and post-fire rehabilitation. The removal of encroaching conifer reduces fuel availability for wildfires in sagebrush ecosystems and can act as a fuel break to halt or slow the progress of a spreading wildfire. Fuel reduction entails thinning thick stands of conifer, mosaic mowing and prescribed burns to limit the spread and decrease the intensity of wildfires while promoting native plant species production. Post-fire rehabilitation helps avoid ecosystem type conversion and promotes the return of suitable sage-grouse habitat though erosion control and seeding of native shrubs and grasses.

ACCOMPLISHMENTS

- To address the threat of wildfire, Bi-State LAWG partners communicate across jurisdictional boundaries to implement coordinated fire-management strategies that minimize the loss of suitable sage-grouse habitat.
- A concerted effort is made to ensure that fire personnel are informed and respond to wildfire with consistency across management boundaries. This requires the ability to: 1) identify locations that provide current or potential habitat for sage-grouse and 2) prioritize fire suppression and management actions in these areas to minimize sage-grouse habitat loss.
- Interagency fire management and suppression agreements were established between the BLM and USFS. Existing fire management plans were updated to include conservation measures identified by the National Sage-Grouse Technical Team to reduce long-term loss of sagebrush.
- Since 2012, a total of 18,034 acres of work, including conifer removal, fuel breaks, fuels reduction and post-fire rehabilitation has occurred in the Pine Nut, Desert Creek-Fales, Mount Grant, Bodie and South Mono PMUs.
- Resource advisor kits are updated annually to provide the most recent information on sage-grouse populations and all fire personnel receive training on fire protocols specific to sage-grouse habitat.
- Wildfire prevention activities include patrols to locate fire starts, document campfires and educate the public on fire regulations.
- LADWP prohibits camping on their lands and has adopted a no campfire policy to reduce the potential for human caused fire.

Bi-State conservation easement

URBANIZATION

Biomes in the arid west have uneven distributions of food and cover, thus fragmentation can be particularly acute for the wildlife that depend on these environments. Many sagebrush obligate species have evolved to require very large areas of intact habitat to meet their seasonal and annual resource needs. Therefore, disturbance of a relatively small number of fragmented sagebrush acres can have a disproportionate impact on the species that need that habitat to survive (Crist, 2015).

Maintaining high quality, intact habitat conditions into the future and addressing the risks associated with urbanization is a high priority in the Desert Creek-Fales, Pine Nut, and South Mono PMUs.

Conservation easements are implemented to limit urban development that may fragment habitat. These are voluntary legal agreements between a landowner and a qualified organization, like a land trust, which places some conservation restrictions on the use of a property to protect its natural values. These agreements provide benefits to both landowners and wildlife. They protect large quantities of suitable habitat from further development and allow landowners to pursue available funding to implement conservation projects on their land.

In addition to conservation easements on private lands, land purchases or exchanges have occurred that resulted in public, state, or federal ownership of occupied sage-grouse habitat. These acquisitions ensure that land remains intact for generations and managed in a way that will maintain quality habitat and provide conservation value to Bi-State sage-grouse.

ACCOMPLISHMENTS

- The Action Plan identifies 12 actions to address the threat of urbanization in the Desert-Creek Fales, Bodie Hills, and White Mountain PMUs, seven of which are complete. In total, 37,412 acres have been entered into conservation easement agreements or have been acquired through land purchase or exchange since 2012. These completed projects insure that connected, high-quality habitat is available for sage-grouse and other wildlife species well into the future.

- Partners have implemented new policies, plans and programs to promote land conservation and to reduce development and human disturbance impacts.

- In 2014 the NRCS designated the Bi-State region as “Grasslands of Special Environmental Significance.” This designation raised the amount of funds NRCS contributes to the acquisition of easements from 50 percent to 75 percent.

- In 2017, the Eastern Sierra Land Trust secured $8 million dollars in funding through the USDA’s Regional Conservation Partnership Program (RCPP) which allowed ranchers and landowners to apply for conservation funding for projects on their lands that benefit both working lands and wildlife.

- Mono County implemented new policies in their County Plan to reduce the impact of development in sage-grouse habitat.

Actions not completed include the following:

- MER2-2: Secure a conservation easement or agreement with the Desert Creek Ranch to maintain essential brood rearing habitat in proximity to lek # 2 in the Desert Creek-Fales PMU.

- MER2-5: Secure a conservation easement or agreement with the Mormon Ranch to maintain essential brood rearing habitat in proximity to the Bridgeport Canyon/ Little Mormon lek complex in the Bodie Hills PMU.

- MER2-6: Secure a conservation easement or agreement for the Aurora Meadow complex to maintain brood rearing habitat in proximity to the Aurora lek in the Mount Grant PMU.

- MER2-8: Secure conservation easements or agreements with willing landowners in the Burcham Flat, Wheeler Flat and Fales Hot Springs vicinities to prevent further development impacts in proximity to leks in the Fales breeding complex in the Desert Creek Fales PMU.

- MER2-12: Secure conservation easements or agreements with willing landowners to maintain key nesting or wintering habitats along the east side of the White Mountains in the White Mountains PMU.

CONIFER ENCROACHMENT

The loss and fragmentation of high-quality, intact sage-grouse habitat to encroaching conifer is a high priority threat in the Pine Nut, Desert Creek-Fales, Mt. Grant, Bodie and White Mountain PMUs. Pinyon pine, juniper, and Jeffery pine are native species in the Bi-State but expansion beyond historical limits due to fire suppression, historic overgrazing by domestic livestock and favorable climate conditions has become problematic (Brockway et al. 2002). Across the Bi-State area, it is estimated that approximately 40 percent of the historically available sagebrush habitat has experienced woodland expansion over the past 150 years (USGS, 2012). Conifer encroachment into sagebrush systems is problematic as it may increase fire severity and size, deplete soil water and nutrients, reduce native understory, provide perches for avian predators, and alter sage-grouse habitat selection. All of which can affect behavioral decisions, distribution, and population dynamics of sage-grouse.

Previous studies have shown that sage-grouse experience population-level impacts at low levels of encroachment and that leks are less likely to be active near small, dispersed trees (Baruch-Murdo et al. 2013). In 2017, the USGS published a study, conducted in the Bi-State, that demonstrated changes in sage-grouse habitat selection and negative effects to vital rates directly associated with encroaching conifer (Coates et al. 2017). To address the threat of conifer encroachment, the USGS and TAC developed a spatially explicit Conservation Planning Tool (CPT). The CPT is a model that ranks the relative benefit of individual conifer removal projects. Bi-State partners can utilize this tool to select and prioritize conifer removal projects that will provide the most conservation value to sage-grouse and maximize benefit from dollars spent. Addressing conifer encroachment and infill provides a myriad of benefits to sage-grouse that include increasing habitat connectivity, maintaining native understory, eliminating perches for predators, conserving soil water and nutrients, and increasing ecosystem resilience to fire and resistance to cheatgrass invasion.

Conifer projects within the Bi-State are ranked using the CPT and the TAC's expertise regarding areas of occupied sage-grouse habitat being impacted by conifer encroachment. Conifer removal projects aim to improve habitat, increase connectivity, and reduce risk to sage-grouse. Phase I conifer cover is targeted to provide the most benefit at the lowest cost. Post-treatment maintenance is often required in the years following initial treatment to ensure that small seedlings and saplings were not missed in the original treatment.

Parker Meadows pre conifer treatment

Parker Meadows post conifer treatment

ACCOMPLISHMENTS

- The Action Plan contains 20 actions that call for the evaluation and implementation of conifer removal projects as a method to restore and maintain intact sagebrush habitat for sage-grouse. Of those 19 have been initiated and are in various states of completion.

- In total, 64,697 acres of conifer treatment and 12,315 acres of conifer treatment maintenance have been completed.

Actions not completed include the following:

MER4-2: Evaluate pinyon-juniper encroachment and potential connectivity issues in the Masonic Gulch, Red Wash, and Chinese Camp vicinities in the Mount Grant PMU.

Native seed collection

Cheatgrass

Aerial seeding with native seed source post fire

INVASIVE AND NOXIOUS SPECIES

Non-native plants are not overly abundant in the Bi-State area, except for cheatgrass, which occurs in all PMUs throughout the range. It is most prevalent in the Pine Nut PMU, where it is identified as a high priority threat and in the Mt. Grant PMU where it is listed as a moderate threat. The infiltration of cheatgrass into sagebrush systems can increase fire potential size and severity, out-compete native understory species after fires, and perpetuate a devastating disturbance cycle.

To counter the threat of habitat loss, Bi-State land management agencies and their partners have implemented numerous conservation actions and strategies. These include strategic fire suppression to avoid ecosystem-type conversion, utilization of native plant species to rehabilitate burned areas, and mechanical and chemical weed treatments.

ACCOMPLISHMENTS

- Since 2012, monitoring to detect invasive annual grasses has occurred on 3,325 acres across multiple PMUs in the Bi-State.
- Post fire restoration and conifer treatment sites are assessed prior to treatment to select appropriate methods to minimize site disturbance that could result in the establishment of non-native plant species.
- Chemical and mechanical treatment of non-native plant species have occurred on 1,786 acres in the Pine Nut, Desert Creek-Fales, Bodie Hills, and South Mono PMUs.
- Native seeds are collected for future Bi-State restoration and rehabilitation projects.

Bi-State meadow habitat

LOSS OF SAGEBRUSH AND MEADOWS

Healthy sagebrush and meadow conditions are necessary components of sage-grouse habitat, crucial to supporting sage-grouse throughout their life cycle. Land managers make every effort to implement best management practices to avoid the degradation of intact sage-grouse habitat through adopted regulatory mechanisms. When sagebrush and meadow conditions are compromised, improvements are made through restoring native hydrology, installing check dams to stabilize stream head-cuts, fencing areas to allow recovery from livestock grazing, prescribed fire, and irrigation.

ACCOMPLISHMENTS

- Through the completion of 40 projects within all Bi-State PMUs, 3,008 acres of meadow and sagebrush were restored or enhanced through irrigation, meadow improvement, and vegetation restoration.
- Meadow habitat improvement efforts on public and private lands in upper Aurora Canyon in the Bodie Hills PMU have been implemented.
- The Bishop BLM installed check dams to stabilize stream area headcuts in 2010, since then additional check dams have been installed in subsequent years and maintenance of these structures occurs annually.
- Hydrological function was returned to Wheeler Creek through restoration efforts to increase plant cover and diversity on adjacent brood meadows.
- The Eastern Sierra Land Trust cleaned up two dump sites and cleared out irrigation ditches in sage-grouse habitat located on privately owned property.
- In 2018 and 2019, the Nevada State Parks conducted proper functioning condition surveys to evaluate and assess stream health within the Walker River State Recreation Area. The objective of these projects is to gather information on creeks and their associated meadows to develop restoration projects designed to reconnect fragmented habitat and restore summer brooding habitat in the Mt. Grant PMU.
- Assessment, inventory, and monitoring (AIM) vegetation plots are completed throughout the Bi-State annually to evaluate ecosystem health.
- Through the Seeds of Success program native seeds were collected at multiple sites to provide a local seed source for restoration projects.
- Between 2015 and 2021, partners met seven times to complete assessments for future wet meadow and stream restoration sites in multiple PMUs.
- LADWP developed an adaptive management plan for irrigating meadows in the Long Valley area of the South Mono PMU to maintain important sage-grouse habitat.

Actions not completed include the following:

HIR1-5-PN: Manage high elevation wet meadows in the southern portion of the Pine Nut PMU. Maintain existing fences and mark with diverters.

HIR2-1-PN: Restore previously burned sagebrush habitat within a three mile radius of Mill Canyon Lek.

HIR2-2-PN: Maintain meadows in Mount Seigal and Bald Mountain areas in proper functioning condition or improve through livestock management.

HIR2-3-PN: Improve sagebrush habitat quality west of Big Meadow.

HIR2-3-MG: Evaluate meadow habitat conditions in the Aurora and Gregory Flat vicinities.

Converting Bodie Hills fence to let down

INFRASTRUCTURE & HUMAN DISTURBANCE

Infrastructure is identified as a high priority threat in the Pine Nut, Desert Creek- Fales and Mount Grant PMUs. The threat of human disturbance is high in the Pine Nut and South Mono PMUs and moderate in the Desert Creek-Fales PMU.

Infrastructure features impacting sage-grouse in the Bi-State region include linear features such as roads, power lines and fences and location specific features like landfills, communication towers and windmills. Impacts from linear features include fragmentation of habitat (Braun 1998), direct mortality through collisions and increased available perches for predators (Connelly et al. 2000). Roads not only fragment habitat but also increase potential for human access and disturbance. Site specific infrastructure, such as landfills, attract and increase predator populations. Recent studies found that transmission lines in central Nevada affected multiple demographic rates of sage-grouse and influenced raven abundance and habitat selection, which had cascading effects to associated sage-grouse populations (Gibson, 2018).

To address threats posed by infrastructure, fences in occupied sage-grouse habitat are evaluated for strike hazards and are either removed, modified, or marked as necessary. Permanent and seasonal road closures serve to reduce disturbance and potential fragmentation. Location specific infrastructure threats are evaluated, and steps are taken to remove structures that increase risk to sage-grouse.

Threats associated with human disturbance include illegal hunting and recreational use impacts to sage-grouse habitat. These threats have been addressed through increased law enforcement, public education and the adoption of land management policies that restrict access to key habitat through road closures, regulation of new road development, and seasonally enforced regulations.

ACCOMPLISHMENTS

The Action Plan identifies 12 actions to decrease infrastructure threats to Bi-State sage-grouse. Since 2012, 11 of these 12 actions have been addressed and include, fence evaluation, the removal of the site-specific hazards, and the following actions:

- Fourteen miles of fence have been removed in the Bodie Hills, Pine Nut, and South Mono PMUs. An additional 7.5 miles of fencing was converted to “let down”. Many miles of fence across the Bi-State were marked with flight diverters.

- LADWP imposes seasonal closures of their land near Crowley Lake during the peak lekking period to reduce the potential for human disturbance. 2,420 acres of land near leks and nesting habitat benefit from seasonal road closures annually.

- Four windmills in Adobe Valley located within the South Mono PMU were removed and converted to solar in 2014. Over six miles of the Fletcher power line located in the Bodie Hills PMU was decommissioned and removed. This project was completed in 2014. Progress toward the closure and relocation of the Mono County landfill has been made through planning and funding acquisition. Closure is on track to be completed in 2024.

- With the new designation of the Walker River State Recreation Area in the Mt. Grant PMU, law enforcement patrols to deter poaching and manage recreational use have increased.

- Partners worked together to develop public lek viewing guidelines and produced outreach material to disseminate information to the public.

- The BLM adopted a land use amendment that regulates the development of new roads or OHV trails in Bi-State sage-grouse habitat. Recreation monitoring and management activities have increased in the South Mono and Bodie Hills PMUs.

Actions not completed include the following:

MER3-7: Minimize impacts from traffic near the Aurora Borealis mine in the Mount Grant PMU.

Converting Bodie Hills fence to let down

GRAZING PERMITTED LIVESTOCK

The grazing of permitted livestock is listed as a low priority threat in all PMUs across the Bi-State. To address the threat of habitat degradation caused by grazing and to implement beneficial livestock management strategies, the NRCS and ESLT provided $8 million in funding for habitat improvement and enhancement projects on private lands through the Regional Conservation Partnership Program. Land management agencies monitor active grazing allotments on their land for compliance with permit terms and conditions within all Bi-State PMUs.

ACCOMPLISHMENTS

- USGS completed livestock surveys in conjunction with sage-grouse monitoring efforts.
- Grazing management tactics to improve sage-grouse habitat were employed across 1,127 acres in the Bodie Hills PMU.
- Fences were erected around the area burned during the Hot Creek Fire in the South Mono PMU to limit grazing impacts to recovering resources.
- Seven range improvement inspections were completed in the Pine Nut and Mount Grant PMUs.
- A 15-year USDA Conservation Reserve Program lease in the Bodie PMU was signed this year protecting 1,054 acres of land.

GRAZING WILD HORSES

Grazing of wild horses and burros are listed as a low or moderate threat in the Pine Nut, Bodie Hills and Mt. Grant PMUs. Each year the USGS documents the presence of wild horses and burros through the completion of raptor, raven, horse, and livestock surveys. Land management agencies make efforts to monitor Bi-State wild horse and burro populations to establish and maintain Appropriate Management Levels (AML) to protect their health as well as that of the habitat they and other species rely upon.

ACCOMPLISHMENTS

- The U.S. Forest Service and BLM completed aerial surveys of the Montgomery Pass Wild Horse Territory to generate a minimum count and assess the herds size compared to the established AML in the Desert Creek Fales PMU.
- USFS staff completed wild horse surveys in the Powell Mountain herd in the Mt. Grant PMU.
- Bishop BLM completed wild horse surveys in the South Mono and Bodie Hills PMUs.
- Horses were gathered in the Wassuk range to maintain AML in the Mt. Grant PMU.
- Carson City BLM District Office organized and implemented a wild horse gather in the Pine Nut Mountain PMU to meet AML, a total of 404 horses were gathered. Animals gathered were made available for adoption at Palomino Valley Wild Horse and Burro Center in Reno through the Wild Horse and Burro Adoption Program. Those that were not adopted are cared for in off-range pastures, where they retain their “wild” status and protection under 1971 Wild Free-Roaming Horses and Burros Act.
- USFS and BLM employees attended the Wild Horse and Burro National Overview meeting, held in Reno, Nevada, to discuss new science and facts, public involvement, ongoing and future planning regarding the management of wild horses and burros.
- The Inyo National Forest filled a rangeland specialist position whose duties include the management of wild horse and burro territories on National Forest lands.

Bi-State partners

COLLABORATIVE CONSERVATION

Additional actions to improve sage-grouse conservation efforts are completed each year to implement a coordinated interagency approach, incorporate a science-based adaptive management plan, improve regulatory mechanisms, and maintain stakeholder involvement.

INTERAGENCY APPROACH

The Action Plan identifies three actions designed to implement a coordinated interagency approach to sage-grouse conservation, all of which have been initiated. These actions include:

- Development of a "Sage-Grouse Service Team" approach to support the conservation and management of sage-grouse populations in the Bi-State. This requires that partners work collaboratively and provide multi-jurisdictional funding to facilitate the conservation of Bi-State sage-grouse and its habitats.

- Each year, Bi-State partners work together to leverage expertise and develop conservation strategies to develop a proposed program of work based on priority, staff availability and funding. Agencies work across jurisdictional boundaries to monitor population demographics, complete vegetation monitoring plots, and carry out Action Plan projects.

- In 2014, Bi-State partners announced a $45 million-dollar commitment to implement the 2012 Action Plan over a 10-year period (Table 5). Under the direction of the Executive Oversight Committee, each partnering agency drafted a commitment letter to the Service, stating their acknowledgment of responsibility and dedication to implement a coordinated interagency approach to conservation.

- Since 2014, approximately 84% of that funding has been allocated with a total of $37.6 million agency dollars spent on sage-grouse conservation efforts over the last eight years (Figure 15).

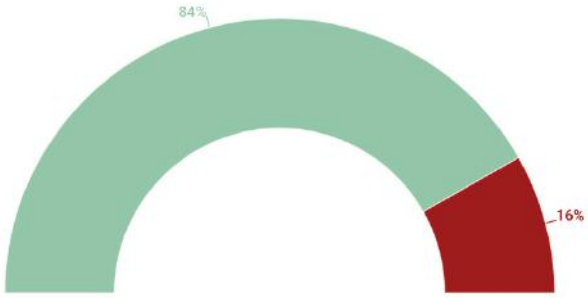


Figure 15: Allocated funding for sage-grouse conservation 2014-2021

Agency	Funding Commitment	Conservation Role
NDOW	$3.6M	Vegetation monitoring, population monitoring
CDFW	$1M	Translocation, population monitoring, predator monitoring, habitat acquisition
USFS	$13.9M	NEPA planning for projects, planting and irrigation plans, grazing management, meadow restoration, population monitoring
NRCS	$12M	Land owner outreach on easement and habitat restoration opportunities, conservation easements, matching funds for partners, utilize program funding to implement projects
BLM	$6.5M	NEPA planning for projects, conifer removal, meadow enhancement, infrastructure evaluation, wild horse assessment, population monitoring
USGS	$2.5M	Develop and apply modeling and science to inform adaptive management, CPT, IPM, population monitoring
Mono County	$5.9M	Coordinate on easement development and provide matching funds, relocate landfill, landowner education and outreach, general plan update
USFWS	$1M	Science and capacity support, landowner engagement and outreach, implementation of private lands restoration opportunities

Table 5: Partner funding commitment and conservation role

SCIENCE-BASED ADAPTIVE MANAGEMENT

Bi-State partners utilize a science-based adaptive management approach to generate a strategic process for guiding sage-grouse management. This approach integrates the best available science to inform local and landscape-level management and conservation decisions for Bi-State sage-grouse.

Science-based adaptive management guides management decisions based on data-driven models, implementation of actions, outcome evaluation and modification of management practices based on this iterative learning process (Bi-State Action Plan, 2012). This management strategy provides insight into what management actions should be conducted and which areas should be targeted, while reducing the chances of carrying out actions in areas where the effects are inconsequential and not meaningful. The Action Plan identifies seven actions necessary to manage sage-grouse populations and implement projects through adaptive, science-based methods. These actions include:

- Establishment of inter-agency agreements and funding mechanisms to support a USGS Science Adviser. The primary duty of the Science Adviser was the development of the Conservation Planning Tool (CPT) to prioritize conservation projects (Bi-State Action Plan, 2012). Funding for this position was initially acquired in 2012 and has been secured annually.

- The six remaining actions detail necessary information to be acquired and incorporated into the CPT to increase its function and management value. These actions include defining habitat, ranking risks, integrating population performance, and identifying factors that influence population vital rates. Each of these actions is carried out annually to improve the predictive power of the CPT and inform management decisions to maximize benefit to Bi-State sage-grouse populations.

- The USGS has also furthered science based adaptive management initiatives through additional research and the development of analytical tools beyond those originally identified in the Action Plan. Those accomplishments include furthering research on sage-grouse response to conifer density and conifer treatment, appropriate normalized difference vegetation index (NDVI) levels for irrigated meadows in sage-grouse habitat, and by developing a targeted annual warning system that helps to identify when sage-grouse subpopulations are experiencing declines that should trigger management actions.

IMPROVED REGULATORY MECHANISMS

The Action Plan outlines 13 actions for improved regulatory mechanisms, 12 of which have been completed. These actions provide consistent land management direction across jurisdictional boundaries to conserve Bi-State sage-grouse and their habitats into the future. Considering the majority of sage-grouse habitat in the Bi-State is on federally managed public lands, effective conservation of Bi-State DPS and its habitats requires strong land use management plans.

Plans are implemented by land management agencies in close coordination with state and federal wildlife agencies to ensure there is seamless regulatory direction for all sage-grouse related issues across management boundaries. These amendments aim to minimize or eliminate threats affecting the status of sage-grouse and to improve habitat conditions. Ongoing plan maintenance occurs to incorporate the most recent information ensuring that public lands containing Bi-State sage-grouse and sage-grouse habitat are adequately protected.

Bi-State land management agencies agreed to adopt plan amendments to incorporate best management practices, standardize operating procedures, implement conservation measures, and mitigate threats to increase regulatory effectiveness and provide direction specific to conservation of the Bi-State DPS. These plan amendments require that agencies consider sage-grouse populations and habitat in land use planning and activity plan analysis to limit potential impacts on sage-grouse or their habitat.

Since the Action Plan was implemented:

- The Humboldt-Toiyabe National Forest has signed an amendment to their Land Use Plan.

- The Carson District and Tonopah Field Offices of the NV BLM have signed ammendments to their Land Use Plans.

- The Inyo National Forest updated their Land Management Plan.

- Mono County has updated their General Plan to better manage Bi-State habitat and protect sage-grouse populations.

Actions not completed include the following:

IRM2-2: Coordinate with local and county governments in Nevada to incorporate sage-grouse conservation guidance.

MAINTAINING STAKEHOLDER INVOLVEMENT

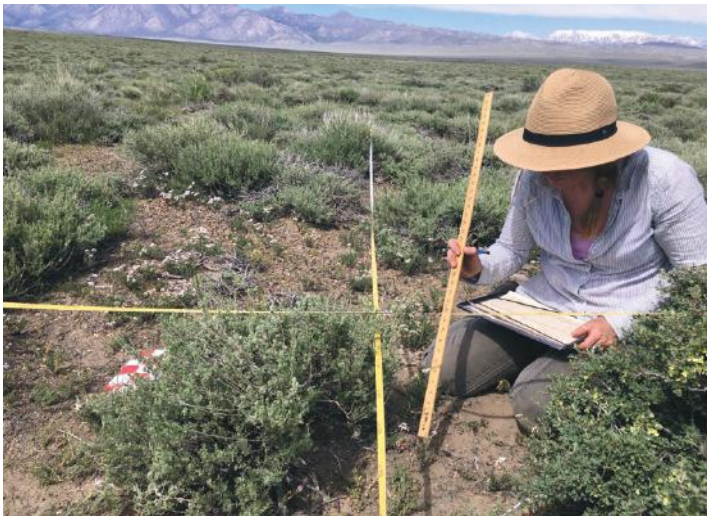
Relationships built on trust and cooperation among stakeholders are essential to the goal of long-term conservation of sage-grouse and its habitats. Participants involved in this conservation effort include federal, state, and local governments; Native American tribes; non-profit organizations; ranchers and landowners; among others. The Action Plan identifies six priorities for maintaining stakeholder involvement, all of which are implemented annually. Actions include conducting Local Area Working Group meetings developing outreach materials to facilitate the sharing and distribution of information, and maintaining a Bi-State website that provides accessible information to partners and the public.

Together, partners conduct Action Plan maintenance, carry out identified actions and track implementation progress to ensure the Action Plan is effectively guiding conservation and management efforts.

Since 2012, considerable progress has been made toward maintaining stakeholder involvement. Accomplishments include:

- Formation of the Bi-State Tribal Natural Resource Committee (BTNRC),20 BTNRC meetings, and two Traditional Ecological Knowledge Summits.
- Thirteen Local Area Working Group meetings.
- Creation of the Bi-State Sage-Grouse website.
- Production of LAWG newsletters to provide sage-grouse related updates and notifications to partners and public.
- 183 education and outreach accomplishments.

Bi-State partners

Bi-State sage-grouse, habitat, and conservation efforts

EFFECTIVENESS MONITORING

The 2012 Action Plan was designed to provide a "road-map" to conservation. It contains 159 actions intended to be implemented over a ten-year span. The implementation of multiple projects is often required to achieve the intended goal of a single action. These projects represent the highest priority actions deemed necessary to conserve Bi-State sage-grouse populations and their habitats. Projects are prioritized through a science-based adaptive management process that utilizes on-the-ground evaluation to inform management decisions and prioritize conservation actions. This process incorporates the best available science and key lessons learned from prior efforts to: 1) identify the most critical issues; 2) develop projects that address those issues and 3) assess and adjust project implementation as necessary to improve the probability of benefiting sage-grouse.

Population monitoring provides the basis of understanding for what types of projects should be implemented and where they should be placed. Utilizing monitoring data, the USGS developed a resource selection function that identified key sage-grouse habitat in the Bi-State. The highest priority projects are in this identified habitat to provide the most ecological benefit to sage-grouse. Published research regarding habitat selection, population models, genetics and conservation strategies all contribute to effective adaptive management. In 2014, the USGS incorporated completed research into the development of a Conservation Planning Tool (CPT), which measures ecological benefits to sage-grouse for a given management action using resource selection functions and estimates of abundance and space use (Ricca et al., 2017). The CPT informs and prioritizes habitat improvement project design and is especially valuable for prioritizing conifer treatment and wildfire restoration projects. Boundaries of these projects are initially drawn as a best guess based on bird use, aerial imagery, and knowledge of the habitat. The CPT then ranks these projects based on benefit to grouse

and cost effectiveness. Each year additional research and monitoring data is incorporated into the CPT, and it becomes more valuable as a result.

In 2015 and again in 2017, the TAC used the CPT results as the basis for re-prioritizing Bi-State conifer projects. This planning tool has proven to be incredibly valuable when combined with other information, such as on-the-ground knowledge of an area, logistics of planning and implementing projects and professional expertise. Combined, these tools provide the basis for prioritization of conservation projects.

Another important scientific tool used to help direct conservation efforts and understand their impacts is USGS' Integrated Population Model (IPM). The IPM helps partners understand the demographic rates that are driving population trends and aids in the development of targeted actions to improve those rates and overall population trends.

Efforts to implement conservation projects across the Bi-State have increased annually since 2012. Currently, 141 of 159 identified actions in the Action Plan have been initiated, meaning they are in progress, ongoing or occur annually, or have been evaluated as part of the planning process. These actions represent 89% of all identified actions in the Action Plan.

The completion of these projects illustrates the effectiveness of long-held and time-tested partnerships between stakeholders. Together, they established and implemented a framework that fostered ongoing problem solving and proactive engagement. This collaborative process effectively integrates multiple perspectives and interests and has proven to be more successful in providing durable solutions to complex issues and challenges.

Over the last ten years, the Action Plan has provided a clear framework to guide this collaborative conservation effort. The Bi-State LAWG increased their understanding of sage-grouse population trends, gained a better understanding of factors influencing populations, and learned how and where to implement conservation actions to provide the greatest benefit to sage-grouse and their habitats. Recent USGS research suggests the implementation of the Action Plan has bolstered Bi-State sage-grouse populations by 3.9% annually and 31.1% since 2012 (Bi-State TAC, 2022).

Moving forward with maintained momentum, Bi-State stakeholders will continue to conduct collaborative conservation efforts at the landscape scale to benefit sage-grouse populations and the sagebrush ecosystem in the Bi-State. The group is currently working to expand the partnership to include the diversity of stakeholders necessary to find solutions to these large-scale and often complex ecological challenges. Together the group will evaluate the most recent science and work to update the Action Plan so that it may continue to act as a guiding document for future sage-grouse related conservation efforts in the Bi-State.

Bi-State sage-grouse lekking in spring

Action Type	Actions Identified	Actions Initiated	Total Projects
Coordinated Interagency Approach	3	3	46
Science Based Adaptive Management	7	7	16
Increased Regulatory Mechanisms	13	12	24
Wildfire	9	9	154
Urbanization	12	7	24
Infrastructure & Human Disturbance	12	11	85
Conifer Encroachment	13	13	85
Disease and Predation	4	4	12
Wild Horses	5	5	13
Small Populations	6	6	8
Habitat Restoration & Improvement	41	35	216
Research and Monitoring	28	27	94
Maintaining Stakeholder Involement	6	6	125
Total	159	145	902

Table 6: Compelted Action Plan associated projects

Action ID	PMU	Action Description
HIR1-5-PN	Pine Nut	Manage high elevation wet meadows in the southern portion of the Pine Nut PMU. Maintain existing fences and mark with diverters
HIR2-1-PN	Pine Nut	Restore previously burned sagebrush habitat within a three mile radius of Mill Canyon Lek
HIR2-2-PN	Pine Nut	Maintain meadows in Mount Seigal and Bald Mountain areas in proper functioning condition or improve through livestock management
HIR2-3-PN	Pine Nut	Improve sagebrush habitat quality west of Big Meadow
MER2-2	Desert Creek/Fales	Secure a conservation easement with Desert Creek Ranch
MER2-8	Desert Creek/Fales	Secure conservation easements with willing landowners in the Burcham Flat, Wheeler Flat and Fales Hot Springs vicinities
HIR2-4-DCF	Desert Creek/Fales	Determine the feasibility for improving perennial grass and forb cover in proximity to Desert Creek Lek #2 in the Desert Creek-Fales PMU. Design and implement site specific habitat improvement projects based on the results
HIR2-6-DCF	Desert Creek/Fales	Evaluate nesting habitat and brood meadow condition on Burcham/Wheeler Flats in the Desert Creek-Fales PMU. Design and implement site specific habitat improvement projects based on the results
HIR2-7-DCF	Desert Creek/Fales	Improve meadow habitat on private lands in Huntoon Valley, Swauger Creek, and north Bridgeport Valley
RAM3-6	Desert Creek/Fales	Continue and supplement ongoing telemetry effort in Fales PMU
MER2-6	Mount Grant	Secure conservation easement or agreement for Aurora Meadows complex
HIR2-3-MG	Mount Grant	Evaluate meadow habitat conditions in the Aurora and Gregory Flat vacinities
MER3-7	Mount Grant	Minimize impacts from traffic near the Aurora Borealis mine
MER4-2	Mount Grant	Evaluate pinyon-juniper encroachment and potential connectivity issues in the Masonic Gulch, Red Wash, and Chinese Camp vicinities of the Mount Grant PMU. Design and implement site-specific tree removal projects based on the results
HIR1-7-B	Bodie Hills	Complete the Lime Kiln windmill removal and solar pump replacement project in the southern portion of the Bodie PMU
MER2-5	Bodie Hills	Secure conservation easement or agreement with Mormon Ranch
MER2-12	White Mountain	Secure conservation easements or agreements along the eastside of the White Mountains
IRM2-2	Multiple PMUs	Coordinate with local and county governments in Nevada to incorporate sage-grouse conservation guidance

Table 7: Action Plan associated projects not yet completed

REFERENCES CITED

Baruch-Mordo, S., Evans, J.S., Severson, J.P., Naugle, D.E., Maestas, J.D., Kiesecker, J.M., Falkowski, M.J., Hagen, C.A., Reese, K.P. 2013. Saving Sage-Grouse From the Trees: A Proactive Solution to Reducing a Key Threat to a Candidate Species. Biological Conservation 167, 233-241.

Blomberg E.J., Sedinger, J.S., Atamian, M.T., Nonne, D.V. Characteristics of climate and landscape disturbance influence the dynamics of greater sage-grouse populations. Ecosphere V. 3 Issue 6. 2012

Bi-State Technical Advisory Committee Nevada and California (TAC), 2012. Bi-State Action Plan Past, Present, and Future Actions for Conservation of the Greater Sage-Grouse Bi-State Distinct Population Segment. 2012.

Coates, P.S., Ricca, M.A., Prochazka, B.G., O'Neil, S.T., Severson, J.P., Mathews, S.R., Espinosa, S.P., Gardner, S., Lisius, S., Delehanty, D.J. Population and Habitat Analyses for Greater Sage-Grouse (Centrocercus Urophasianus) in the Bi-State Distinct Population Segment: 2018 Update. U.S. Geological Survey Open File Report 2019-1149.

Coates, P.S., Prochazka B., Ricca, M.A., Gustafson, K., Ziegler, P. 2017. Pinyon and Juniper Encroachment into Sagebrush Ecosystems Impacts Distribution and Survival of Greater Sage Grouse.

Coates, P.S., Ammon, E., Milligan, M., Mathews, S., Greater Sage-grouse (Centrocercus urophasianus) Monitoring in the Bi-State Distinct Population Segment, California and Nevada, 2008–21. 2022.

Connelly, J.W., Schroeder, M.A., Sands, A.R., Braun, C.E., 2000. Guidelines to Manage Sage-Grouse Populations and Habitats. Wildlife Society Bulletin 28. 967-985.

Ernst- Brock, C., Turner, L., Tausch, R. and Leger, E. 2019. Long-Term Vegetation Responses to Pinyon-Juniper Reduction Treatments in Shrub-lands of Nevada, USA. Journal of Environmental Management

Holmgren. M., Stapp, P., Dickman, C.R., Gracia, C., Graham, S., Gutierrez, J.R., Lima, M. 2006. Extreme Climatic Events Shape Arid and Semi-Arid Ecosystems. Frontier in Ecology and the Environment 4, 87-95.

Mathews, S.R., Coates, P.S., Prochazka, B.G., Meyerpeter, M.B., Espinosa, S.P., Lisius, S., Gardner, S.C., Zeigler, P., Delehanty, D.J. 2018. An Integrated Population Model for Greater Sage-Grouse (Centrocercus Urophasianus) in the Bi-State Distinct Population Segment, California and Nevada, 2003-2017: U.S. Geological Survey Open-File Report 2018-1177, p. 89.

Meyerpeter, M., Lazenby K., Coates, P., Ricca, M., Mathews, S., Gardner, S., Dahlgren, D., Delehanty, D. Field Methods for Translocating Female Greater Sage-Grouse (Centrocercus urophasianus) with their Broods. Wildlife Society Bulletin. 2021.

Mount, J., Escriva-Bou, A., Sencan, G. Managing Drought in a Changing Climate (PPIC 2018), Water and the Future of the San Joaquin Valley (PPIC 2019), A Path Forward for California's Freshwater Ecosystems (PPIC 2019), Water Use in California (PPIC 2019). 2021.

Pilliod, D.S., Welty, J.L, and R. Arkle. 2017a. Refining the Cheatgrass-Fire Cycle in the Great Basin: Precipitation Timing and Fine Fuel Composition Predict Wildfire Trends.

Pilliod, D.S., Welty, J.L., Toevs, G.R., 2017b. Seventy-Five Years of Vegetation Treatments on Public Rangelands in the Great Basin of North America. Rangelands 39, 1-9. doi:10.1016/j.rala. 2016.12.001

Turner, L. Van Dellen, A.W., Saenz, J. 2019 Bi-State Habitation Restoration Project Monitoring Report.

Turner, L., Pellant, M., Pyke, D., Swanson, S., Chambers, J., Forbis, T. and Herrick, J. 2010. Nevada Partners for Conservation and Development Pre and Post Habitat Treatment Vegetation

U.S. Geological Survey (USGS). 2012. Unpublished data. Geographical Information System Analysis Predicting Woodland Expansion in the Bi-State. Western Ecological Research Center, Dixon Field Station, Dixon, California.

APPENDIX A: ACTION PLAN IMPLEMENTATION

Strategy	Identified Actions	Completed Projects
Coordinated Interagency Approach: Implement a coordinated interagency approach towards conservation and management of greater sage-grouse populations and habitats within the Bi-State Plan area.		
	CIA1-1: Implement a "Sage-Grouse Service Team" approach to support sage-grouse conservation and management in the Bi-State area. Provide cross-jurisdictional staff support to facilitate the coordinated interagency effort to conserve the Bi-State DPS and its habitat.	
		Executive Oversight Committee meetings
		Development of the Bi-State coordinator position
		Updated Bi-State MOU
	CIA1-2: Provide multi-jurisdictional funding to support sage-grouse conservation and management in the Bi-State area. Establish a process to identify and support cross-jurisdictional funding opportunities to facilitate the coordinated interagency effort to conserve the Bi-State DPS and its habitat.	
		2014 Partner funding commitment letters
		2019 update of funding commitment letters
		Interagency funding agreements to support on-the-ground projects, USGS science and research, lek monitoring, vegetation monitoring, Bi-State coordinator position, translocation efforts, and the Traditional Ecological Knowledge Summit
	CIA1-3: Annually engage the Bi-State Local Area Working Group (LAWG) via the Technical Advisory Committee (TAC) to develop a proposed program of work for the upcoming calendar year based on available staff and funding. The proposed annual program of work should be completed by January 31 each calendar year.	
		Technical Advisory Committee meetings
		Annual accomplishment reporting
Science Based Adaptive Management: Implement scientifically and economically sound management strategies to conserve greater sage-grouse populations and habitats within the Bi-State Plan area.		
	SAM1-1: Establish interagency agreements and funding mechanisms needed to provide funding and logistical support to secure the services of a USGS Science Advisor.	
		Annual funding provided to USGS
	SAM2-1: Acquire high resolution (5 meter or less), multi-spectral (7 band minimum), imagery for the entire Bi-State area and begin the image classification and field verification process required to model sage-grouse habitat selection and suitability based on resource availability and use.	
		Bi-State Sage-Grouse resource selection function and map developed
		Critical habitat map created
		Pinyon-juniper layer acquired to model habitat
		Life-stage habitat selection maps generated
	SAM2-2: Continually incorporate new sage-grouse telemetry, habitat, and vital rate data into the CPT to improve predictive modeling and adaptive management capabilities.	
		Telemetry data has been incorporated into the CPT

	SAM2-3: Incorporate the CPT into habitat improvement project design and population augmentation and reintroduction evaluation processes to provide managers with an interactive, spatially-explicit tool to choose the most appropriate areas for management action, as well as to evaluate and quantify project effectiveness following implementation.	
		CPT was created and published in Ecological Applications
		CPT used to rank conifer treatment projects in 2015 and 2017
		Meetings held regarding updated and automated CPT
	SAM2-4: Incorporate hypothesized risk factors into the CPT to model and quantify the relative importance of each risk factor by life-history stage for each PMU.	
		In progress
	SAM2-5: Incorporate sage-grouse vital rates into the CPT to identify which environmental factors are likely exerting the greatest influence on sage-grouse persistence to determine the probability of population performance for each PMU.	
		Integrated Population Models completed and updated
		Incorporating the IPM into CPT in progress
	SAM2-6: Incorporate the vital rate adjusted CPT into habitat improvement project design and population augmentation and reintroduction evaluation processes to further improve managers abilities to choose the most appropriate areas for management action, as well as to evaluate and quantify project effectiveness following implementation.	
		Life-stage habitat selection maps generated
		Incorporating the IPM into CPT in progress
Improved Regulatory Mechanisms: Improve regulatory effectiveness and consistency for discretionary agency actions that may affect the Bi-State DPS and its habitats.		
	IRM1-1: Develop and issue interim BLM/USFS guidance designed to increase the regulatory effectiveness and consistency for Federal land management actions that may affect the Bi-State DPS and its habitat until land use plans are updated to include additional guidance specific to sage-grouse conservation in the Bi-State area. Land use plan updates are identified by relative priority in this section.	
		2012 Inyo NF supervisors letter
		2012 BLM NV Instructional Memorandum
	IRM1-2: Coordinate and informally confer with state wildlife agencies and the FWS when evaluating Federal land management actions that may affect the Bi-State DPS and its habitat or when developing and implementing policies or land use plan objectives designed to avoid or minimize impacts to the Bi-State DPS and its habitat.	
		Inter-Agency Coordination for Land Management Actions
		USFWS Coordination and Conferencing
	IRM1-3: Implement BLM Manual 6840 to increase conservation efforts for the Bi-State DPS and its habitat.	
		All projects for BLM follow guidance in Manual Policies

	IRM1-4: Implement National Forest Manual 2670 to increase conservation efforts for the Bi-State DPS and its habitat.	
		BSSG designation as USFS Sensitive Species for Region 4
		Implementation of National Forest Plan Policies
		Implement BSSG in policy and in LMP as "At Risk Species"
		Inyo Land Use Plan Implementation
	IRM1-5: Revise the Carson City District Consolidated RMP (Sierra Front and Stillwater Field Offices) to incorporate additional land use plan guidance specific to greater sage-grouse conservation.	
		Land Use Planning Amendment for the Bi-State DPS in the Carson City District RMP
	IRM1-6: Revise or amend the Toiyabe National Forest LRMP (Bridgeport and Carson Ranger Districts) according to the Region 4 schedule.	
		The "Greater Sage-grouse Bi-state Distinct Population Segment Forest Plan Amendment Record of Decision" was signed in May 2016, revising the Forest Plan with new conservation measures for the Bi-state sage-grouse.
	IRM1-7: Revise the Tonopah RMP (Tonopah Field Office) to incorporate additional land use plan guidance specific to greater sage-grouse conservation	
		Land Use Planning Amendment for the Bi-State DPS in the Tonopah RMP
	IRM1-8: Revise the Inyo National Forest LRMP (Mono Lake, Mammoth, White Mountain and Mount Whitney Ranger Districts) according to the Region 5 schedule.	
		Inyo NF Land Use Plan revised and updated
	IRM1-9: Implement actions in support of the Bishop RMP.	
		Implementation of Bishop BLM Supplemental Rules to Land Use Plan
	IRM1-10: Revise or amend the Bishop RMP according to the California BLM schedule.	
		Current plan deemed adequate
	IRM1-11: Annually conduct plan maintenance on applicable RMPs (Carson City, Tonopah, and Bishop) to incorporate the most recent information specific to sage-grouse populations and habitats on public lands administered by the BLM to insure the Bi-State DPS and its habitats are adequately protected	
		Annual and ongoing incorporation of relevant science into Annual Plans
	IRM2-1: Coordinate with Mono County to develop and incorporate sage-grouse conservation guidance into applicable plans and programs.	
		Mono County General Plan update
		Mono County review projects for consistency with grouse policies
	IRM2-2: Coordinate with county and local governments in Nevada to develop and incorporate sage-grouse conservation guidance into applicable plans and programs.	
		Efforts have been made to reach out to county and local government but successful engagement is still lacking

Minimize and Eliminate Wildfire Risk: Implement a coordinated interstate/interagency approach towards management of wildfire incidents and suppression activities designed to minimize the risk of catastrophic wildfire and the associated loss of sage-grouse habitat in the Bi-State area.		
	MER1-1: Develop and implement an interagency fire management and suppression agreement specific to the management of wildland fire incidents within and immediately adjacent to known occupied and potential sage-grouse habitats in the Bi-State area prior to the 2012 fire season.	
		Inter-agency fire agreement was signed for the Inyo National Forest and the Bishop BLM
		Inter-agency fire agreement was signed between Carson BLM and H-T National Forest
	MER1-2: Update existing Fire Management Plans (FMPs) to incorporate fire and fuels management conservation measures identified by the National Sage-Grouse Technical Team prior to the 2012 fire season.	
		Fire management plans were updated to incorporate suppression direction to minimize loss of suitable sage-grouse habitat.
	MER1-3: Annually update dispatch systems and protocols to include line officer and resource advisor notifications and requirements for all wildland fire incidents within and immediately adjacent to known occupied and potential sage-grouse habitats in the Bi-State area.	
		Annual Bishop BLM dispatch updates for fire protocols in sage-grouse habitat
		Annual Carson BLM dispatch updates for fire protocols in sage-grouse habitat
		Annual Inyo NF dispatch updates for fire protocols in sage-grouse habitat
	MER1-4: Annually update resource advisor kits to include to the most recent information specific to sage-grouse populations and habitats within the Bi-State area to insure the DPS and its habitat are adequately protected.	
		Resource Advisor Kit Updates- BLM Bishop/ Inyo NF
		Resource Advisor Kit Updates- Humboldt-Toiyabe NF
		Resource Advisor Kit Updates- BLM Carson
	MER1-5: Develop and provide sagebrush and sage-grouse habitat sensitivity training during required annual fireline refreshers for federal fire personnel in the Bi-State area. Focus training on sagebrush habitat identification, basic sagebrush habitat ecology, and initial attack strategies and tactics designed to minimize long-term impacts to sagebrush ecosystems.	
		Bishop BLM annual fire refresher for sage-grouse SOPs
		Inyo NF annual fire refresher for sage-grouse SOPs
	MER1-6: Establish an interagency cadre of sagebrush/ sage-grouse habitat resource advisors (READs) to support fire suppression, burned area emergency rehabilitation (BAER), and fuels management projects in the Bi-State area. Include NDOW, CDFG, FWS, NRCS, and NDF representation on this team.	
		Resource Advisor Development and Cadre

	MER1-7: Prioritize fire suppression actions, fire rehabilitation efforts, and fuels treatments to minimize sagebrush habitat loss or type conversions in and immediately adjacent to known occupied and potential sage-grouse habitats in the Bi-State area.	
		Alpine County forest restoration project
		Burbank fire rehabilitation seeding
		Ray May fire rehabilitation seeding
		TRE fire rehabilitation seeding
		Como fire rehabilitation seeding
		Preacher fire rehabilitation seeding
		Doe Ridge fire rehabilitation, restoration, and planting
		Indian fire rehabilitation, seeding, planting, and erosion control
		Mono fire restoration seeding
		Spring Peak fire rehabilitation and conifer removal
		Spring Peak fire rehabilitation, seeding, sagebrush planting, and conifer removal
		Walker fire Sage-Grouse SOPs implemented
		Bodie fire invasive plant removal
		Indian fire seeding
		Green Creek fire rehabilitation
		Pine Nut Land Health Project (sunrise unit)
		Fuel breaks on private land
		Bodie State Park fuels reduction
		Green Creek fire restoration
		Owens River fire restoration
		Slinkard post fire restoration, planting, seeding, invasive species removal, and mowing
		Buckskin Valley post-fire rehabilitation
		Pipeline conifer thinning
		Sunrise Pass firewood stewardship contract
		Illinois Unit, Thinning/Pile Burning
		Seeding of dozer lines on Hot Creek fire
		Hot Creek fire restoration, grazing enclosure, seeding, and planting
		West Antelope fuel break maintenance
		East Antelope fuel break maintenance
		Mono City and Conway Ranch Estates fuel break maintenance
		Tufa fire suppression
		Lyon Fire sagebrush seedling planting
		Mountain View Fire ESR plan and treatment
		Slink Fire soil stabilization, seeding, and planting
		Topaz Marine Corps housing fuel break
	MER1-8: Increase wildfire prevention activities and programs in and adjacent to known occupied and potential sage-grouse habitats in the Bi-State area.	
		LADWP policy restricting campfires and stoves
		Fire prevention patrols
		Bodie State Park Fire Plan
		Targeted wildfire prevention

		Fire related public education events
	MER1-9: Develop and implement a native species seed bank program for the Bi-State DPS. Establish a seed storage facility and conduct seed collections to insure the availability of locally adapted seed for fire rehabilitation efforts in important sage-grouse habitats. Coordinate with the Nevada Division of Forestry (NDF) and other interested agencies to collect and store locally adapted seed for use in fire rehabilitation efforts.	
		Seeds of Success program
		Post fire native seeding contracts
		Seed storage facility for native plants
		Bishop native plant nursery
		Native seed collection
Minimizing and Eliminating Urbanization Risk: Secure conservation easements or agreements with willing landowners to maintain private lands and associated sage-grouse habitats values and minimize the risk of future development impacts to important sage-grouse habitats in the Bi-State area.		
	MER2-1: Provide technical assistance to willing landowners to develop Conservation Agreements or Candidate Conservation Agreements with Assurances.	
		Private Lands Conservation Plan
		CDFW and Mono County workshop to share information and develop project conditions/mitigations for sage grouse
		Designation of Walker River State Recreation Area
		Funding aquisition for Black Lake Preserve easement
		Annual conservation easement planning
		Mono County conservation easement assistance
	MER2-2: Secure a conservation easement or agreement with the Desert Creek Ranch to maintain essential brood rearing habitat in proximity to Desert Creek Lek #2 in the Desert Creek-Fales PMU.	
		Incomplete
	MER2-3: Secure a conservation easement or agreement with the Sceirine Ranch to maintain current land use practices and associated sage-grouse brood rearing/late summer habitat values in the Bodie, Mount Grant and Desert Creek-Fales PMUs.	
		Easements secured in the Bodie Hills and Desert Creek-Fales PMUs
	MER2-4: Secure a conservation easement or agreement with the Sweetwater Ranch to maintain essential brood rearing habitat in proximity to the Wiley Ditch/Sweetwater Summit lek complex in the Desert Creek-Fales PMU.	
		Easements secured near Sweetwater Summit
	MER2-5: Secure a conservation easement or agreement for the Mormon Ranch to maintain essential brood rearing habitat in proximity to the Bridgeport Canyon/Little Mormon lek complex in the Bodie PMU.	
		Incomplete
	MER2-6: Secure a conservation easement or agreement for the Aurora Meadows complex to maintain brood rearing habitat in proximity to the Aurora lek in the Mount Grant PMU.	
		Incomplete

	MER2-7: Secure a conservation easement or agreement for Sinnamon Meadows to maintain brood rearing/late summer habitat values in the western portion of the Bodie PMU.	
		Easement secured
	MER2-8: Secure conservation easements or agreements with willing landowners in the Burcham Flat, Wheeler Flat and Fales Hot Springs vicinities to prevent further development impacts in proximity to leks in the Fales breeding complex in the Desert Creek-Fales PMU.	
		Incomplete
	MER2-9: Secure conservation easements or agreements with willing landowners for important brood meadow habitat in the Green Creek area.	
		Green Creek land donation
		CDFW aquired lands
		Conservation easement secured
	MER2-10: Secure conservation easements or agreements with willing landowners to maintain key brood rearing/late summer habitats in Bodie Hills portion of the Bodie PMU.	
		Easements secured
	MER2-11: Secure conservation easements or agreements with willing landowners in Huntoon Valley, Swauger Creek and northern Bridgeport Valley to maintain brood rearing/late summer habitat values in the southwest portion of the Desert Creek-Fales PMU.	
		Easement secured in Huntoon Valley
	MER2-12: Secure conservation easements or agreements with willing landowners to maintain key nesting or wintering habitats along the eastside of the White Mountains in the White Mountains PMU.	
		Incomplete
Minimize and Eliminate Infrastructure and Human Disturbance Risk: Implement site-specific conservation measures designed to minimize or eliminate risks associated with existing infrastructure and human disturbance in the Bi-State area.		
	MER3-1: Install flight diverters on the existing non-let down fence adjacent to Long Valley Lek 2 to deter documented fence strikes.	
		Fence near lek 2 converted to lek down
		Flight diverters installed in surrounding area
	MER3-2: Identify and provide an alternate location for the Mono County landfill and work towards removing the existing landfill out of the Long Valley portion of the South Mono PMU.	
		Mono County continued planning and funding acquisition for the closure of the Benton Crossing landfill. The project is projected to be completed by 2023
	MER3-3: Design and implement public lek viewing guidelines and other management strategies to reduce human disturbance in the vicinity of Desert Creek Lek #2 in the Desert Creek-Fales PMU.	
		Developed lek viewing guidelines consistent with widely accepted policies to ensure minimization of potential human impacts. Produced brochure for public education and outreach

	MER3-4: Evaluate existing fences in the Bodie PMU for fence strike hazards. Remove extraneous fences or mark existing fences with flight diverters to deter fence strikes in areas where fence strike hazards are documented. Focus initial efforts in the vicinity of Bodie State Historic Park, 7-Troughs, and Lower Summers Meadow.	
		Race Track fence removal and fence marking
		Lower Summers meadow fence marking
		Bodie Creek Electric Fence Removal
		Sinnamon Meadows fence removal and fence marking
		Bodie Bowl fence removal
		Conway Ranch fence removal and fence marking
		Private lands fence marking in Bodie
		Bodie State Park Volunteer Day - fence and corral Removal
		Bodie Hills fence marking near Beideman lek
		Big Flat fence marking
		Bodie Hill fence maintenance
		Potato Peak exclosure fence converted to let down
		Converted Fence to Let Down in the Bodie Hills
		BLM annual maintenance of all let down fencing in Bodie Hills PMU
	MER3-5: Work with private landowners in the Long Valley portion of the South Mono PMU to evaluate existing fences for fence strike hazards. Provide assistance to modify or mark existing fences with flight diverters to deter fence strikes in areas where fence strike hazards are documented.	
		Cashbaugh fence marking
	MER3-6: Remove or relocate the existing fence near Wiley Ditch Lek #3 in the Desert Creek-Fales PMU if flight diverters are ineffective at preventing fence strikes.	
		Flight diverters installed in surrounding area
	MER3-7: Develop and implement stipulations to minimize disturbance impacts associated with increased traffic from the Aurora-Borealis mine in the Mount Grant PMU.	
		Incomplete
	MER3-8: Increase warden presence during the sage-grouse breeding season in the lower elevations of the Mount Grant PMU to deter poaching.	
		Walker River State Recreation law enforcement and park patrols
	MER3-9: Avoid the construction of new roads and other infrastructure within known occupied and potential sage-grouse habitat in the Mount Siegel and Bald Mountain vicinities in the Pine Nut PMU unless these features are designed to improve habitat conditions.	
		BLM Resource Management Plans contain actions and best management practices to address new road construction. Future planned Travel Management will take into consideration limiting any new roads/OHV trails in this area as well
	MER3-10: Design and implement public lek viewing guidelines to address potential human disturbance impacts if demand increases in the Long Valley portion of the South Mono PMU.	

		Developed lek viewing guidelines consistent with widely accepted policies to ensure minimization of potential human impacts. Produced brochure for public education and outreach
	MER3-11: Install "grouse crossing" signs at strategic locations along the Owens River Road in the Long Valley portion of the South Mono PMU where birds are known to roost and road kills have been documented.	
		CDFW, BLM and Mono County met to discuss "grouse crossing sign". Action deemed not necessary in Long Valley. Signs were installed in Parker Meadow area
	MER3-12: Provide educational opportunities to landowners about the importance of sage-grouse habitat and the need to reduce predation caused by pets in areas where sage-grouse occur.	
		NRCS, federal land management agencies, and ESLT all interact with private landowners to stress the importance of sage-grouse habitat
Minimize and Eliminate Conifer Encroachment Risk: Map and quantify the spatial juxtaposition and level of pinyon-juniper encroachment that has occurred in relation to known occupied and potential sage-grouse habitat in the Bi-State area. Develop and implement site specific treatments designed to maintain, improve, or restore key seasonal ranges and habitat connectivity within and among breeding populations based on restoration potential.		
	MER4-1: Evaluate pinyon-juniper encroachment and potential connectivity issues between upper elevation sagebrush habitats in the Bodie PMU and adjacent low elevation habitats including the Bridgeport Valley and East Walker River in the Bodie and Desert Creek-Fales PMUs and the East Walker River, Ninemile Flat, Aurora, and Alkali Valley portions of the Mount Grant PMU. Design and implement site-specific tree removal projects based on the results.	
		East Walker Landscape Habitat Improvement Project NEPA
		East Walker Landscape Habitat Improvement Project Units A & C
		East Walker Landscape Habitat Improvement Project Units F & B
		East Walker Landscape Habitat Improvement Project Unit D
		East Walker Landscape Habitat Improvement Project Unit B East
		East Walker Landscape Habitat Improvement Project Unit B
		East Walker Landscape Habitat Improvement Project Unit C
		East Walker Landscape Habitat Improvement Unit E
		East Walker Landscape Habitat Improvement Unit K
		East Walker Landscape Habitat Improvement Unit L
		East Walker Landscape Habitat Improvement Unit N
		Mormon Meadows Conifer Removal and pile scattering
		Bridgeport Canyon Conifer Removal
		Bridgeport Canyon Sagebrush Restoration through Conifer Removal
		Big Flat Conifer Removal

		Bodie Hills Upland Vegetation Restoration Conifer Removal DNA 2015
		Bodie Hills Upland Vegetation Restoration Conifer Removal DNA 2016
	MER4-2: Evaluate pinyon-juniper encroachment and potential connectivity issues in the Masonic Gulch, Red Wash, and Chinese Camp vicinities of the Mount Grant PMU. Design and implement site-specific tree removal projects based on the results.	
		Incomplete
	MER4-3: Evaluate pinyon-juniper encroachment and potential connectivity issues in the Huntoon Valley, Swauger Creek and Mount Jackson vicinities of the Desert Creek-Fales PMU. Design and implement site-specific tree removal projects based on the results.	
		The TAC evaluated these areas in 2015 (CPT reranking reports) and determined they were a lower priority than other work in the northern half of the Bi-State. After high priority work is completed the TAC will reevaluate using the CPT and local knowledge
	MER4-4: Evaluate pinyon-juniper encroachment and potential connectivity issues in the Aurora and Gregory Flats vicinities of the Mount Grant PMU. Design and implement site-specific tree removal projects based on the results.	
		The TAC evaluated these areas in 2015 (CPT reranking reports) and determined they were a lower priority than other work in the northern half of the Bi-State. After high priority work is completed the TAC will reevaluate using the CPT and local knowledge
	MER4-5: Evaluate pinyon-juniper encroachment and potential connectivity issues in the lower Rough Creek and Del Monte Canyon vicinities of the Mount Grant PMU. Design and implement site-specific tree removal projects based on the results.	
		Rough Creek Sage-Grouse Habitat Improvement Project NEPA
		Rough Creek Unit 5
		Rough Creek Unit 1
		Rough Creek Unit 2
		Rough Creek Unit 3
		Rough Creek Unit 6
		Rough Creek Unit 7
		Rough Creek Unit 8
	MER4-6: Evaluate pinyon-juniper encroachment and potential connectivity issues in the Spring Peak, Mount Hicks, and Powell Mountain vicinities of the Mount Grant PMU. Design and implement site-specific tree removal projects based on the results.	
		Field evalutation determined that there were only about 10 trees to cut in a drainage. Other trees were in true conifer areas.
	MER4-7: Evaluate pinyon-juniper encroachment and potential connectivity issues in the Baldwin Canyon and Lapon Canyon vicinities of the Mount Grant PMU. Design and implement site-specific tree removal projects based on the results.	
		Hawthorne Army Depot meeting
		Baldwin Canyon PJ NEPA
		Baldwin Canyon Habitat Improvement

	MER4-8: Evaluate pinyon-juniper encroachment and potential connectivity issues between upper elevation sagebrush habitats in the Bodie PMU and adjacent low elevation habitats in the Mono Basin portion of the Bodie PMU. Design and implement site-specific tree removal projects based on the results.	
		Bodie Hills Upland Vegetation Restoration Conifer Removal 2015
		Bodie Hills Upland Vegetaion Restoration Conifer Removal 2016
		Sinnamon Cut Sagebrush Restoration through Conifer Removal
		Bodie Hills Pinyon-Juniper Removal NEPA 2021
		Bridgeport Canyon Conifer Pile Burning
	Action MER4-9: Evaluate pinyon-juniper encroachment and potential connectivity issues along the northern flank of the Sweetwater Mountains between Burcham Flat and Jackass Flat in the Desert Creek-Fales PMU. Design and implement site-specific tree removal projects based on the results.	
		Sweetwater P-J Re-treatment
		Jackass Flat Pinyon-Juniper Removal NEPA
	MER4-10: Evaluate pinyon-juniper encroachment and potential connectivity issues along the eastside of the White Mountains and Palmetto Mountains in the White Mountains PMU. Design and implement site-specific tree removal projects based on the results.	
		TAC evaluated these areas in 2015 and determined they were lower priority than other work in the southern half of the Bi-State. Additional data from telemetry studies will help define these areas
		TAC evaluated these areas in 2017 and determined they were lower priority than other work in the southern half of the Bi-State. Additional data from telemetry studies will help define these areas
	MER4-11: Evaluate pinyon-juniper encroachment and potential connectivity issues along the eastside in the Truman Meadows portion of the White Mountains PMU. Design and implement site-specific tree removal projects based on the results.	
		TAC evaluated these areas in 2015 and determined they were lower priority than other work in the PMU
		TAC evaluated these areas in 2017 and determined they were lower priority than other work in the PMU
	MER4-12: Evaluate pinyon-juniper encroachment and potential connectivity issues between Long Valley and Adobe Valley in the South Mono PMU. Design and implement site-specific tree removal projects based on the results.	
		Arcularius Jeffrey Pine Removal
		Long Valley Habitat Enhancement NEPA
		INF Parker Jeffrey Pine Removal NEPA
		Long Valley - Jeffery Pine Removal
		South Mono Conifer Treatment Site Visits
		Pre-NEPA Planning: Hilton and Clover Patch Conifer Treatment
	MER4-13: Evaluate pinyon-juniper encroachment and potential connectivity issues in the Waterson draw area and at the base of south slope of Glass Mountains in the South Mono PMU. Design and implement site-specific tree removal projects based on the results.	

		Long Valley Unit 4 Habitat Enhancement
Minimize and Eliminate Disease and Predation Risk: Monitor, and quantify where possible, the extent of disease and predation risks to greater sage-grouse populations in the Bi-State area. Take appropriate management action where causal effects can be identified and effectively mitigated.		
	MER5-1: Evaluate raptor and raven use of the DC Intertie transmission line in the Mount Grant PMU. Install perch deterrents if the data indicate facilitated predation is adversely affecting sage-grouse population performance.	
		Raptor raven surveys were completed in Mount Grant in association with telemetry efforts in 2016, 2017, 2018, and 2021
	MER5-2: Evaluate raptor and raven use of the double wood transmission line that crosses brood meadows along the upper Owens River east of Lek 9x at Inaja Ranch. Install perch deterrents if the data indicate facilitated predation is adversely affecting sage-grouse population performance.	
		A field trip occurred to evaluate this transmission line. No mitigation was implemented
		Raptor raven surveys were completed in Long Valley in association with telemetry efforts between 2014 and 2021
		USGS implemented raven egg oiling effort to reduce predation
	MER5-3: Evaluate raptor and raven use of the west-side transmission lines in the Bodie PMU. Install perch deterrents if the data indicate facilitated predation is adversely affecting sage-grouse population performance.	
		Raptor raven surveys were completed annually in the Bodie Hills in association with telemetry efforts
	MER5-4: Develop and implement a West Nile virus surveillance and detection program. Implement mosquito abatement measures and/or Best Management Practices (BMPs) designed to minimize or prevent the potential for a West Nile virus outbreak if the data indicate that West Nile virus is prevalent in the Bi-State area.	
		Investigation of Inyo guzzlers resulted in their design that prohibit larval development due to the enclosed systems, lack of light, routine maintenance at off-site drinker. County Abatement Program confirmed that such guzzlers do not pose a risk to west Nile virus
Minimize and Eliminate Wild Horse Grazing Risks: Maintain wild horse populations at the appropriate management levels (AMLs) and within designated herd management areas (HMAs) or wild horse territories (WHTs) to minimize the risk of excessive use levels and range expansion		
	MER6-1: Implement captures or contraceptive methods to maintain the Powell Mountain Wild Horse Herd at or below AML and within the designated WHT.	
		Annual monitoring of the Powell Mountain herd for horses outside boundary
	MER6-2: Implement captures or contraceptive methods to maintain the Pine Nut Wild Horse Herd at or below AML and within the designated HMA.	
		Pine Nut Mountains Herd Management Area Plan EA
		Pine Nut wild horse gather
		Pine Nut wild horse sterilization efforts

	MER6-3: Evaluate the status of the White Mountain and Silver Peak Wild Horse and Burro herds. Establish AML and implement captures or contraceptive methods if needed to maintain the herds at or below AML and within the designated WHT.	
		Wild Horse monitoring in White Mountain and Silver Peak herds in White Mountains PMU
	MER6-4: Implement captures or contraceptive methods to maintain the Wassuk Wild Horse Herd at or below AML and within the designated HMA.	
		Wassuks Mountain wild horse gather
	MER6-5: Evaluate the status of the Montgomery Pass Wild Horse Herd. Establish AML and implement captures or contraceptive methods if needed to maintain the herd at or below AML and within the designated WHT.	
		2014 Montgomery Pass wild horse herd survey
		2015 Montgomery Pass wild horse population estimate completed
		Annual wild horse monitoring in Sagehen
		2020 aerial survey of the Montgomery Herd Wild Horse Territory
		2020 Montgomery Pass wild horse ground survey
Minimize and Eliminate Small Population Size Risks: Identify potential sage-grouse population augmentation and re-introduction sites and develop translocation guidelines to support potential augmentation and reintroduction efforts in the Bi-State area.		
	MER7-1: Develop a contingency plan for emergency augmentation of small breeding populations at Parker Meadows and Gaspipe Spring in the South Mono PMU if the need arises.	
		Parker Meadow translocation efforts 2017, 2018, 2019, and 2021
	MER7-2: Develop a contingency plan for emergency augmentation of small breeding populations in the Pine Nut Range in the Pine Nut PMU if the need arises.	
		TAC met to discuss translocations 2015. It was determined that only the Parker population was in need of a translocation until the IPM or other data suggested that there was an clear reason to begin translocation elsewhere. Leks in the pine nuts are monitored yearly to track the status of the population
	MER7-3: Evaluate the need for augmentation of the Fales population in the Desert Creek- Fales PMU.	
		Discussions within the TAC have occurred , but translocations have not been implemented at this time?
	MER7-4: Evaluate the Powel Mountain area in the Mount Grant PMU as a potential sage-grouse habitat restoration and reintroduction area.	
		BSSG TAC met to discuss translocations 2015. It was determined that only the Parker population was in need of a translocation until the IPM or other data suggested that there was an clear reason to begin translocation elsewhere
	MER7-5: Evaluate the McBride Flat/Sagehen Spring area in the Truman Meadows portion of the White Mountains PMU as a potential sage-grouse habitat restoration and reintroduction area.	

		BSSG TAC met to discuss translocations 2015. It was determined that only the Parker population was in need of a translocation until the IPM or other data suggested that there was an clearn reason to begin translocation elsewhere. Telemetry work in the White Mountain PMU will help determine if this is necessary
	MER7-6: Evaluate Coyote Flat as a potential sage-grouse habitat restoration and reintroduction area.	
		BSSG TAC met to discuss translocations 2015. It was determined that only the Parker population was in need of a translocation until the IPM or other data suggested that there was an clear reason to begin translocation elsewhere. Telemetry work in the White Mountain PMU will help determine if this is necessary
Habitat Improvement and Restoration: Implement habitat improvement and restoration projects designed to ensure the long-term viability of greater sage-grouse populations within the Bi-State Plan area. Continue to implement on-going habitat improvement and restoration projects on public and private lands in the Bi-State area. Design and implement additional site-specific sage-grouse habitat improvement and restoration projects on public and private lands in the Bi-State area in cooperation with the Bi-State Local Area Work Group.		
	HIR1-1-PN: Continue to implement pinyon and juniper removal projects in appropriate areas adjacent to occupied sage-grouse habitat in Upper Mill Canyon in the Pine Nut PMU.	
		Mill Canyon conifer treatment Lyon Unit
		Mill Canyon conifer treatment unit 1
		Mill Canyon conifer treatment unit 2
		Mill Canyon conifer treatment Big Lake unit
		Mill Canyon conifer treatment maintenance
		Mt Siegel conifer treatment
	HIR1-2-PN: Continue to implement pinyon and juniper removal in the Buckskin Valley Vegetation Treatment project area in the Pine Nut PMU.	
		EQIP contract to treat a portion of the BLM land in Buckskin Valley project area (3 sites: 411, 147, 747)
		2012 Buckskin Valley Vegetation Management Project
		2013 Buckskin Valley Vegetation Management Project
		Private Lands EQIP/WHIP program: PJ Removal in Buckskin Valley area
		2013 EQIP contract to treat a portion of the BLM land in Buckskin Valley project area
		2014 EQIP contract to treat a portion of the BLM land in Buckskin Valley project area
		2015 EQIP contract to treat Crest Unit of Pine Nut Land Health Project
		Buckskin Valley conifer treatment
		2013 private lands conifer treatment
		Crest 2 conifer treatment
		Lyons Fire conifer removal
		Crest 3 conifer treatment
		Buckskin Valley conifer treatment maintenance
		Pine Nut Mountain Powerline Project

		2020 Buckskin Valley conifer treatment
		2021 Buckskin conifer treatment
	HIR1-3-PN: Maintain the existing fence around the Big Meadow complex in the Pine Nut PMU and mark with flight diverters to deter fence strikes.	
		Big Meadow fence marking
		Big Meadow fence maintenance
	HIR1-4-PN: Continue to manage livestock to maintain proper functioning condition of the Big Meadow complex in the Pine Nut PMU.	
		Churchill Canyon grazing permit written with flexibility to change grazing if probems arise
	HIR1-5-PN: Manage high elevation wet meadows in the southern portion of the Pine Nut PMU for proper functioning condition and forb abundance and diversity. Maintain existing fences and mark with flight diverters to deter fence strikes.	
		Incomplete
	HIR2-1-PN: Restore previously burned sagebrush habitat within a three-mile radius of the Mill Canyon lek in the Pine Nut PMU.	
		Incomplete
	HIR2-2-PN: Maintain meadows in the Mount Siegel/ Bald Mountain area in proper functioning condition or improve through livestock management or fencing in the Pine Nut PMU.	
		Incomplete
	HIR2-3-PN: Evaluate options to improve sagebrush habitat quality west of the Big Meadow complex in the Pine Nut PMU. Design and implement site specific habitat improvement projects based on the results.	
		Incomplete
	HIR2-4-PN: Control noxious weeds within and surrounding the Big Meadow complex in the Pine Nut PMU.	
		Ongoing weed treatments completed by Carson City BLM
	HIR1-1-DCF: Continue pinyon and juniper removal across Sweetwater Flat and in adjacent pinyon and juniper encroached sagebrush habitats in the Desert Creek-Fales PMU.	
		2013 Sweetwater Summit conifer treatment maintenance
		2016 Sweetwater Summit conifer treatment
		2017 Sweetwater Summit conifer treatment maintenance
	HIR1-2-DCF: Implement the Long Doctor pinyon-juniper removal project in the Desert Creek-Fales PMU.	
		Long Doctor pinyon removal-Sweetwater Summit area 2012
		Long Doctor pinyon removal - Sweetwater Summit Area 2013
		Long Doctor pinyon removal - Sweetwater Summit Area 2014
		Long Doctor pinyon removal maintenance 2015
	HIR1-3-DCF: Continue to work with the permittees on Wheeler Flat to develop and implement grazing management strategies that reduce the impacts of early season grazing on key brood meadows in the Desert Creek-Fales PMU.	

		Wheeler Flat fence marking
		Wheeler Flat trough installation
	HIR1-4-DCF: Continue to develop and implement an interagency restoration plan for Wheeler Creek to restore hydrologic function and increase forb cover and diversity on adjacent brood meadows in the Desert Creek-Fales PMU.	
		Wheeler Creek restoration NEPA
		Wheeler Creek meadow restoration
	HIR2-1-DCF: Design and implement site specific projects to improve meadow habitat conditions on Wheeler Flat in the Desert Creek-Fales PMU.	
		Wheeler Flat enclosure fence construction, marking, and maintenance
	HIR2-2-DCF: Investigate opportunities to implement habitat improvement projects on the Sweetwater Ranch in the Desert Creek-Fales PMU. Design and implement site specific habitat improvement projects where feasible.	Private Lands-EQIP/WHIP conifer treatment
		Sweetwater Flat fence marking
	HIR2-3-DCF: Evaluate options to reduce cheatgrass densities southeast of Desert Creek Lek #2 in the Desert Creek-Fales PMU. Design and implement site specific habitat improvement projects based on the results.	
		2013 Smith Valley Conservation District weed treatments
	HIR2-4-DCF: Determine the feasibility for improving perennial grass and forb cover in proximity to Desert Creek Lek #2 in the Desert Creek-Fales PMU. Design and implement site specific habitat improvement projects based on the results.	
		Incomplete
	HIR2-5-DCF: Determine the feasibility for improving perennial grass and forb cover across Sweetwater Flat to improve pre-laying and nesting habitat conditions in the Desert Creek-Fales PMU. Design and implement site specific habitat improvement projects based on the results.	
		Private Lands-EQIP/WHIP program irrigation project
		Private Lands-EQIP/WHIP program rabbit brush removal project
	HIR2-6-DCF: Evaluate nesting habitat and brood meadow condition on Burcham/Wheeler Flats in the Desert Creek-Fales PMU. Design and implement site specific habitat improvement projects based on the results.	
		Incomplete
	HIR2-7-DCF: Investigate opportunities for meadow habitat improvement on private lands in the Huntoon Valley, Swauger Creek and north Bridgeport Valley vicinities in the Desert Creek-Fales PMU. Design and implement site specific habitat improvement projects where feasible.	
		Incomplete
	HIR1-1-MG: Continue pinyon and juniper removal in the China Camp area and adjacent public and private lands in the Mount Grant PMU.	
		China Camp pinyon removal 2012
		China Camp pinyon removal 2013
		China Camp pile burning 2016

		Flying M conifer treatment
		China Camp (Long Meadow) conifer treatment
		Private lands conifer treatment
	HIR2-1-MG: Develop and implement a management strategy to restore brood habitat on the Rosachi Ranch in the Mount Grant PMU.	
		2012 Meadow restoration Rosaschi Ranch
		2014 Rosaschi Ranch brood rearing habitat improvement
		Rosachi Ranch annual irrigation
		2013 Meadow Restoration Rosaschi Ranch
		Rosaschi Ranch upland field restoration (east field)
		Rosaschi Ranch upland field restoration (west field)
	HIR2-2-MG: Work with Flying M Ranch to maintain and improve brood habitat conditions in the Rough Creek and lower Bodie Creek vicinities of the Mount Grant PMU. Design and implement site specific habitat improvement projects where feasible.	
		Flying M Ranch project demonstration sites (seeding and fuel break)
		FM Ranch sage-grouse habitat enhancement
		Meadow and stream proper functioning condition surveys completed
		UAV surveys in Walker River State Recreation Area
		9 Mile Ranch fence marking
		Installed HOBOs on Bodie and Rough Creeks
		Streamflow monitoring
	HIR2-3-MG: Evaluate meadow habitat conditions in the Aurora and Gregory Flats vicinities of the Mount Grant PMU. Design and implement meadow habitat restoration projects based on the results.	
		Incomplete
	HIR2-4-MG: Work with the Hawthorne Army Depot to maintain and improve brood habitat quality at Lapon Meadows in the Mount Grant PMU. Design and implement site specific habitat improvement projects where feasible.	
		2013 Hawthorne Army Depot meeting
	HIR2-5-MG: Investigate options to control noxious weeds and cheatgrass within and around the Ninemile Ranch Unit in the Mount Grant PMU. Design and implement site specific habitat restoration projects based on the results.	
		2012 Smith Valley Conservation District weed monitoring and treatment
		2013 Smith Valley Conservation District weed monitoring and treatment
		2015 Smith Valley Conservation District weed monitoring and treatment
		2016 Smith Valley Conservation District weed monitoring and treatment
		2017 Smith Valley Conservation District weed monitoring and treatment
		2019 Nine Mile weed monitoring and treatment
		2020 Nine Mile weed monitoring and treatment
	HIR1-1-B: Complete ongoing pinyon and juniper removal projects in the Lower Summers (Lek 10), Green Creek, Stringer Meadows (Lek 9A), and Upper Aurora Canyon vicinities in the Bodie PMU.	

		Lek 9a conifer treatment maintenance
		Lower Summers conifer treatment
		Lower Summers conifer treatment East Unit
		Lower Summers conifer treatment Meadow Unit
		Lower Summers conifer treatment maintenance
		2012 Upper Aurora conifer treatment maintenance
		2013 Upper Aurora conifer treatment maintenance
		2014 Upper Aurora conifer treatment maintenance
		Stringer Meadow Unit conifer treatment
		Green Creek conifer treatment
		Green Creek conifer treatment
		2012 Green Creek conifer treatment maintenance
		2014 Green Creek conifer treatment maintenance
		2018 Green Creek conifer treatment maintenance
		2017 Greeen Creek pile burn
	HIR1-2-B: Maintain existing meadow habitat protective enclosures in the Bodie Hills portion of the Bodie PMU. Incorporate targeted short-duration grazing to improve brood meadow forb production where appropriate.	
		Murphy Meadow #1 fence conversion and yearly exclosure maintenance
		Upper Bodie Creek riparian pasture
		Aspen B1072 exclosure
		Artesian Spring exclosure
		Murphy Meadows exclosure #2
		Aspen P1094 exclosure
		7 Troughs Riparian Pasture
		Fourway Meadow exclosure
		N. Potato Peak Meadow exclosure
		Aspen P1094A exclosure
		Aspen B1075 exclosure
		Aspen B1076 exclosure
		Upper Geiger meadow exclosure
		Geiger Meadow #1 exclosure maintenance
		Geiger Meadow #2 exclosure maintenance
		Kirkwood Meadow restoration
	HIR1-3-B: Continue meadow habitat improvement efforts on public and private lands in Upper Aurora Canyon in the Bodie PMU.	
		Private Lands-EQIP/WHIP program rabbitbrush control
		Upper Aurora Canyon meadow improvement
		Aurora meadow owing
		Aurora Canyon electric fence
		Aurora Canyon headcut stabilization
		Aurora Canyon exclosure maintenance
	HIR1-4-B: Complete the planned removal of the Bodie to Fletcher transmission line that traverses portions of both the Bodie and Mount Grant PMUs.	
		Bodie sub to Fletcher sub power line removal

	HIR1-5-B: Continue to manage permitted livestock grazing to maintain current nesting habitat quality in the Bodie Hills breeding complex in the Bodie PMU.	
		Bodie Mountain Allotment
		Dog Creek Allotment
		Green Creek Allotment
		Mono Sand Flat Allotment
		Mormon Ranch Allotment
		Potato Peak Allotment
		Rancheria Gulch Allotment
		Aurora Canyon Allotment
		15 Year CRP Lease
	HIR1-6-B: Complete the ongoing NEPA analysis to support implementation of sage-grouse habitat improvement projects in the Bodie PMU consistent with the findings of the Bodie Hills Conservation Action Plan (Provencher et al. 2009).	
		Bodie Hills Upland Vegetation Restoration Programmatic NEPA
	HIR1-7-B: Complete the Lime Kiln windmill removal and solar pump replacement project in the southern portion of the Bodie PMU.	
		Incomplete
	HIR2-1-B: Evaluate stringer meadows, spring complexes, and irrigated meadows in the Bodie PMU as potential brood habitat improvement sites. Design and implement site specific habitat improvement projects based on the results.	
		Warm Springs meadow improvement
		Private Lands - EQIP/WHIP program project-watering facility to redistribute livestock
		Field tour with Sherm Swanson to assess riparian areas
		Drafted EA and NEPA for Bodie Hills meadow restoration
	HIR2-2-B: Evaluate mid-elevation sagebrush habitats in the Bodie Hills breeding complex for potential early brood habitat improvement sites in the Bodie PMU. Design and implement site specific habitat improvement projects based on the results.	
		Noxious weed survey and treatment
	HIR1-1-SM: Continue to implement and enforce seasonal road closures designed to reduce human disturbance on public lands in the vicinity of Lek 1, Lek 5, and Lek 8 in the Long Valley portion of the South Mono PMU.	
		Lek 8 nesting habitat seasonal closure
		Lek 1 nesting habitat seasonal closure
		Lek 5 nesting habitat seasonal closure
		Long Valley seasonal road closure
	HIR1-2-SM: Continue to monitor for illegal vehicle use and camping within the Long Valley portion of the South Mono PMU. Increase law enforcement presence and enforcement activities were required to minimize or eliminate recreation impacts.	
		Shepherd's Tub vegetation restoration
		Habitat protection through boulder placement
		Inyo NF Long Valley recreation monitoring
		Long Valley restoration project

		Bishop BLM Long Valley recreation monitoring
	HIR1-3-SM: Implement the proposed tree encroachment removal project near Sagehen Summit in the South Mono PMU.	
		2014 Sagehen Summit conifer treatment
		Sagehen II Sage-Grouse Habitat Enhancement Project NEPA
		2018 Sagehen II conifer treatment
	HIR1-4-SM: Continue to monitor implementation of new grazing permit terms and conditions in the Long Valley portion of the South Mono PMU. Identify priorities for more intensive management attention, especially in upland sagebrush types.	
		Annual livestock grazing monitoring
	HIR1-5-SM: Complete the windmill removal and solar pump replacement projects in the Adobe Valley portion of the South Mono PMU.	
		Four Adobe Valley windmills removed and conversion to solar
	HIR1-6-SM: Maintain the Indian Spring protective fence in the Mono Basin portion of the South Mono PMU.	
		Fence removed after fire. Now riparian area is monitored and maintained.
	HIR2-1-SM: In drought years, work with the LADWP to prioritize irrigation for important brood meadows (e.g., Laurel meadows) in the Long Valley portion of the South Mono PMU.	
		CDFW works with LADWP to advise on best irrigation practices
		LADWP, CDFW, USFWS, Audubon met to discuss water allocation strategies in Long Valley that provide adequate habitat for bird and fish species while maintaining LADWP's mission to provide water to paying customers
		LADWP submitted a commitment letter to the USFWS stating willingnes to manage their land with best management practices for sage-grouse in mind
		LADWP developed and implemented and Adaptive Management Plan for watering in Long Valley
Research and Monitoring: Implement a coordinated interagency research and monitoring program to support the conservation and management of greater sage-grouse populations and habitats within the Bi-State Plan area.		
	RAM1-1: Coordinate annual lek monitoring efforts across state and federal jurisdictional boundaries.	
		Annual lek counts are carried out by a diversity of partners across the Bi-State
	RAM1-2: Increase the level of interagency support and effort for annual lek counts in the Pine Nut, Desert Creek-Fales, Mount Grant, and White Mountains PMUs. Implement "saturation counts" where logistically feasible.	
		Beginning in 2012 NDOW, Bishop BLM, Carson BLM, USGS, CDFW determine staff needs and coordinate lek surveys in Pine Nut, Desert Creek-Fales, Mt. Grant, and White Mountain PMUs
	RAM1-3: Maintain the current level of interagency support and effort required to conduct annual "saturation counts" in the Bodie and South Mono PMUs.	

		Annual coordinated saturation counts. BIFO/CDFW leads the coordination of these counts. LADWP, NRCS, USFS and volunteers are involved
	RAM1-4: Conduct a systematic aerial inventory of potential breeding habitats in the Bi-State area to identify new or previously undocumented leks.	
		Aerial lek inventory occurred in 2012
	RAM1-5: Focus aerial lek monitoring efforts on remote or otherwise inaccessible locations. Augment aerial surveys with ground counts when and where logistically feasible.	
		Aerial helicopter surveys are conducted most years in hard to access areas in the the Pine Nut, Desert Creek and Mount Grant PMUs
	RAM1-6: Increase the level of volunteer training and support for annual lek monitoring efforts in the Bi-State area.	
		Mono County Lek tour and training
		Annual Bi-State volunteer lek survey training
	RAM1-7: Incorporate lek habitat inventory and assessment protocols identified in the interagency Sage-Grouse Habitat Assessment Framework (Stiver et al. 2010) into lek inventory and monitoring efforts in the Bi-State area.	
		Sage-grouse HAF conducted on leks within Mount Grant PMU in FY19 included Baldwin Canyon, Nine Mile Flat, Nine Mile 2, and Mudspring leks. 4 more in Pine Nut PMU
	RAM1-8: Develop and implement a standardized lek location database for documented (active and historic) leks in the Bi-State area.	
		Development of the California Lek database
		Development of the integrated lek database (CA and NV)
	RAM2-1: Identify and map existing sagebrush habitats and important sage-grouse habitats within each PMU. Develop a draft interim habitat map for the Bi-State area by April 30, 2012. Complete a final interim habitat map for the Bi-State area by September 30, 2012.	
		Published map of BSSG habitat
	RAM2-2: Incorporate standardized vegetation and environmental characteristics data sampling into existing agency vegetation inventory and monitoring protocols to support the development and implementation of the Conservation Planning Tool (CPT).	
		Standardized vegetation sampling protocols for treatment efficacy
		Standardized vegetation sampling protocols for nest and brood sites
	RAM2-3: Incorporate multi-scale sage-grouse habitat inventory and assessment protocols identified in the interagency Sage-Grouse Habitat Assessment Framework (Stiver et al. 2010) into habitat inventory and monitoring efforts in the BiState area.	
		Annual vegetation monitoring and treatment efficiency monitoring
	RAM3-1: Continue and expand the on-going telemetry effort in the Pine Nut PMU. Incorporate additional capture locations into the study design based on lek inventory results.	

		Capture and monitoring efforts in the Pine Nut PMU (2012-2015)
	RAM3-2: Implement a new telemetry effort in the Mount Grant PMU to supplement and expand on previous efforts focused in the Bodie PMU. Focus initial capture efforts in the China Camp, Baldwin Canyon, Aurora and Lapon Meadows lek areas, as well as brood rearing habitat on Ninemile Ranch and Scierine Ranch. Incorporate additional capture locations into the study design based on lek inventory results.	
		Capture and monitoring efforts in the Mount Grant PMU (2012-2018 and 2021)
	RAM3-3: Implement a new telemetry effort in the Desert Creek portion of the Desert Creek-Fales PMU to supplement and expand on previous efforts. Focus initial capture efforts in the Desert Creek, Sweetwater and Wiley Ditch lek areas, as well as brood-rearing habitats on the Desert Creek Ranch, Sweetwater Ranch and Scierine Ranch. Incorporate additional capture locations into the study design based on lek inventory results.	
		Capture and monitoring efforts in the Desert Creek-Fales PMU (2012, 2015-2018)
	RAM3-4: Implement a new telemetry effort in the White Mountains PMU to supplement and expand on previous efforts. Incorporate the use of GPS technology to improve data collection capabilities in the White Mountains. Incorporate additional capture locations into the study design based on lek inventory results.	
		Capture and monitoring efforts in the White Mountain PMU (2013, 2016-2021)
	RAM3-5: Continue and supplement the on-going radio telemetry effort in the South Mono PMU. Focus new capture efforts in the Sagehen Summit, Sagehen Meadows, Gaspipe Spring and McLaughlin Spring areas. Incorporate additional capture locations into the study design based on lek inventory results.	
		Capture and monitoring efforts in the South Mono PMU (2014-2021)
	RAM3-6: Continue and supplement the on-going telemetry effort in the Fales Portion of the Desert Creek-Fales PMU. Focus additional capture efforts in the upper elevations of the Sweetwater Range and in the Huntoon Valley. Incorporate additional capture locations into the study design based on lek inventory results.	
		Incomplete
	RAM3-7: Continue and supplement the on-going radio telemetry effort in the Bodie PMU. Focus additional capture efforts in previously un-sampled lek areas and habitat restoration project areas. Incorporate additional capture locations into the study design based on lek inventory results.	
		Capture and monitoring efforts in the Bodie Hills PMU (2012-2021)
	RAM3-8: Collect vegetation and environmental characteristics data at telemetry relocation points and random points following standardized protocols to support the development and implementation of the Conservation Planning Tool (CPT).	
		Vegetation characteristics collected at telemetry locations

	RAM3-9: Incorporate the use of GPS technology into the study design for ongoing and planned telemetry efforts to collect data on intra-day and potential long-range and inter-PMU movements.	
		USGS deploys GPS collars to monitor sage-grouse movement
	RAM3-10: Collect feces in addition to environmental and vegetation characteristics data at winter relocations for diet quality analysis using gas chromatography	
		UC Davis diet and behaviorial study was completed
	RAM4-1A: Collect a blood sample from each captured bird and submit these samples to the University of Denver for genetic analyses.	
		Blood samples are collected
	RAM4-1B: Collect feathers from each captured bird and submit these samples to the University of Idaho and/or the US Forest Service Rocky Mountain Research Station (RMRS) genetics lab in Missoula, Montana for genetic analyses.	
		Feathers are collected
	RAM4-1C: Collect morphological measurements from each captured bird to calculate body condition index (BCI) by obtaining mass, flat wing, tarsus, and culmen measurements.	
		Morphological measurements are collected
	RAM4-2: Collect feathers from each monitored lek and submit these samples to the University of Idaho and/or the US Forest Service RMRS genetics lab in Missoula, Montana for genetic analyses.	
		Feathers are collected and genetic analyses are complete
	RAM5-1A: Develop and implement a standardized spatial database (ArcMap geodatabase) to collect and store all greater sage-grouse conservation related project work occurring in the Bi-State area. Coordinate geodatabase development with signatories to the Bi-State MOU and the Bi-State LAWG to ensure end user compatibility. Populate the geodatabase with conservation actions completed to date by September 30, 2012. Establish procedures for effective and efficient geodatabase maintenance and distribution.	
		Geodatabase to track BSSG projects was developed
	RAM5-1B: Develop and implement a standardized tabular database (Microsoft Access database) to collect and store all greater sage-grouse related conservation work occurring in the Bi-State area. Coordinate database development with signatories to the Bi-State MOU and the Bi-State LAWG to ensure end user compatibility. Populate the database with conservation actions completed to date by September 30, 2012. Establish procedures for effective and efficient database maintenance and distribution.	
		Tabular database was developed
	RAM5-2: Investigate options to develop and implement an Interagency BiState Sage-Grouse Conservation sharepoint site to facilitate collaborative projects and data sharing. If determined to be feasible, establish the sharepoint site and provide access to signatories of the Bi-State MOU.	
		Google Drive created

Maintaining Stakeholder Involvement: Develop active, well informed, local planning groups committed to the development and implementation of sage-grouse conservation actions within the Bi-State Plan area.		
	MSI1: Continue to support the stakeholder based Bi-State Local Area Working Group (LAWG) process to identify, develop, and implement PMU specific conservation actions for greater sage-grouse populations and habitats in the Bi-State area.	
		The Sage-Grouse Conservation Plan for Bi-State Area is updated through meetings held by the Technical Advisory Committe
	MSI1-2: Conduct PMU planning meetings on an as needed basis to address PMU specific issues and to identify, develop, and prioritize PMU specific conservation actions.	
		Minden NRCS SGI SWAT Workshop
		Long Valley Tribal Forum
		Adobe Field Tour
		Parker Meadow Field Tour
		Presentation on the BSSG to the LA Audubon in Bishop
		Aurora Canyon Road Hydrology Restoration Field Trip
		Pine Nut Project Field Tour with Assistant Secretary of Interior
		Pine Nut Project, Field tour with NCCS regional director
		Pine Nut Land Health Annual Meeting
		LAWG Field Tour of 9 Mile Ranch
		Nevada PMU Meeting
		Parker Meadow Disturbance Meeting
	MSI1-3: Conduct Bi-State LAWG planning meetings on a semi-annual basis to review the status of greater sage-grouse populations and habitats in the Bi-State area and to identify, prioritize, and coordinate implementation of annual conservation actions. Continue University of Nevada Cooperative Extension facilitation of the BiState LAWG meeting.	
		Annual Bi-State LAWG meetings held
	MSI2-1: Conduct workshops to provide information about programs available to assist ranchers and other private landowners that may be interested in the implementation of sage-grouse conservation projects and to explore opportunities for cooperative conservation of sage-grouse in the Bi-State area.	
		Bi-State landowner open house
		RCPP Grant meeting
		Deep Springs resource management team meeting
		Mono County meetings
	MSI2-2: Develop and publish a Bi-State LAWG sage-grouse conservation newsletter.	
		Mailchimp e-newsletter was created
	MSI2-3: Develop and implement a publically accessible Bi-State LAWG Sage-Grouse Conservation webpage to facilitate the sharing and distribution of information specific to greater sage-grouse conservation efforts in the Bi-State area.	
		Website was created and is mainainted to provide BSSG related information