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Greater Sage-Grouse Conservation Plan for the Bi-State Plan Area of Nevada and Eastern California

First Edition

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The Bi-State Local Planning Group

In Conjunction with:
The Nevada Governor's Conservation Team

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PREFACE

The Bi-State Planning Group consists of local biologists, land managers, land users, and others who share a common concern for the Greater Sage-Grouse in western Nevada and Eastern California. The *Greater Sage-Grouse Conservation Plan for the Bi-State Plan Area of Nevada and Eastern California* -FIRST EDITION- represents more than two years of collaborative analyses and planning. Still, with much that has been accomplished, our work is not done.

The Bi-State Planning Group remains intact and committed to:

- Completing risk assessments and conservation action planning;
- Verifying and expanding existing baseline data,
- Implementing conservation actions;
- Monitoring the results of our efforts; and
- Revising this plan as we learn more about our sage-grouse populations.

The extensive effort that has been given to this process speaks to the value and energy of local planning and the *en Libra* process. The members of the Bi-State Planning Group wish to express our gratitude to Governor Kenny Guinn for the opportunity to participate in this important project that either directly or indirectly affects us all.

1.0 INTRODUCTION

1.1 Background

Sage-grouse populations in Nevada have been in decline for the last two decades. In some areas their habitat has been degraded or decreased by both human and natural causes. The decline has placed the species in jeopardy, and a listing under the Endangered Species Act is under consideration.

In recognition of the importance of sage-grouse conservation, Nevada Governor Kenny Guinn appointed a task force which became known as the "Governor's Sage-grouse Conservation Team." In August 2000 the Governor's Team was organized and included representatives from industry, Native Americans, conservation organizations, land management agencies, legislators, and professional biologists. This team prepared a sage-grouse conservation strategy that offered tools, resources, and current scientific information to local planning groups to formulate a statewide Sage-grouse Conservation Plan.

Local planning groups were charged with developing **workable solutions to specific on-the-ground challenges.** Local groups were asked to consider alternatives, develop strategies, and implement plans for natural resource management actions that will enhance and benefit sage-grouse. The local plans are intended to form the cornerstones of a statewide conservation agreement.

1.2 Purpose

The purpose of this plan is to report the conservation strategies developed by the Bi-State Planning group. This plan addresses important plan components recommended by the US Fish and Wildlife Service (USFWS) Policy for Evaluation of Conservation Efforts when Making Listing Decisions (PECE Policy) including agreements among agencies, implementation schedules, adaptive management, and financial strategies to implement the plan.

The goals of the Governor's Sage-grouse Conservation Team are as follows:

1. Create healthy, self-sustaining sage-grouse populations throughout the species' historic range by:

    - Maintaining and restoring ecologically diverse, sustainable, and contiguous sagebrush ecosystems, and
    - Implementing scientifically sound management practices.

2. Have locally functional, well-informed groups throughout sage-grouse range in Nevada, empowered to actively contribute to sage-grouse conservation while balancing habitat, bird, and economic considerations.

2.0 CONSERVATION ASSESSMENT APPROACH

2.3 Genetic Background for the Bi-State Sage-grouse Populations

In the late 1990s the Western Association of Fish and Wildlife Agencies (WAFWA), Sage-grouse and Columbian Sharp-tailed Grouse Technical Committee solicited a research proposal to facilitate a better understanding of gene flow, genetic diversity and evolutionary history between greater sage-grouse populations across their range and to determine the validity of the eastern and western subspecies. The research effort initiated by the University of Denver included collection, processing, and analysis of DNA extracted from tissue samples taken from greater sage-grouse across their range. Each western state wildlife agency within the range of the greater sage-grouse contributed funds towards this effort. The results from this research are reported in Benedict et al. (2003) and Taylor (2001).

The initial research by Benedict et al. (2003), sequenced a rapidly evolving portion of the mitochondrial control region in 332 birds from 16 populations across the greater sage-grouse range. This research did not find genetic evidence to support the delineation of the eastern and western subspecies. However, this research did reveal that the Greater sage-grouse population(s) within the Bi-State Conservation Planning Area contain an unusually high proportion of unique haplotypes (genetic markers). Benedict et al. (2003) concluded that geographic isolation and lack of gene flow within neighboring populations has been extensive enough to allow populations within the Bi-State Planning Area to develop an unusually large amount of genetic distinctiveness.

Research conducted by Sonja Taylor (2001) used nuclear DNA markers instead of mitochondrial DNA markers as were used in Benedict et al. (2003). Mitochondrial DNA is maternally inherited and is relatively small compared to the nuclear genome. Nuclear data can often uncover additional variation in the male genetic contribution. Taylor's (2001) research using nuclear DNA further supported the hypothesis that geographic isolation and genetic drift have caused the Mono County (CA) and Lyon County (NV) populations to become genetically distinct from other greater sage-grouse. Taylor (2001) explains in her thesis that although Mono/Lyon populations may be considered a *Management Unit* as defined by Moritz (1994) because significant divergence of alleles at nuclear and mitochondrial loci have been demonstrated, these populations would not be considered an *Evolutionary Significant Unit* (Moritz 1994). Although the uniqueness of mitochondrial haplotypes in the Mono/Lyon sage-grouse suggests that interbreeding with neighboring populations has not occurred in recent history, based on the number of haplotypes found, there is no evidence of any recent genetic bottlenecks within these populations (Taylor 2001).

General observations indicate that there are no obvious physical or morphological differences in the Mono/Lyon population that distinguish it from other greater sage-grouse populations. Young et al. (1994) did find some level of difference between California and Colorado populations while studying behavioral characteristics of sage-grouse across their range. This observation, along with the previous research, led to the development of a cooperatively funded research project, in the spring of 2001. The principle researcher was Sonja Taylor (UOD) funded by CDFG, BLM, and Quail Unlimited, Inc. This study was designed to compare male sage-grouse strut displays from Lassen County (CA) and Nye

County (NV) with the strut displays from Mono County (CA) and Lyon County (NV) and to compare morphological measurements as well. Preliminary results for the behavioral analysis indicates that there are no significant differences in male sage-grouse strut displays between birds within the Bi-State Conservation Planning Area and Lassen County (CA) and Nye County (NV) birds. (Taylor and Young unpublished results) However, due to a lack of morphometric samples, the morphological comparison portion of this study (measurements of bill, tarsus, wing cord, and weight) was not completed. Additional sampling is proposed below to answer genetic questions surrounding the Mono/Lyon populations.

Conservation Action: Genetic Research and Sampling

Risk: Lack of information on the genetic status of the Mono/Lyon sage-grouse populations.

Objective: Determine the spatial extent of this genetically unique population and further describe the genetic uniqueness of the greater sage-grouse in the Bi-State area. If the Mono/Lyon sage-grouse are found to be an Evolutionary Significant Unit, determine the population boundary to facilitate management planning and actions by identifying critical conservation linkages.

Rationale: Comparison of genetic markers between adjacent PMUs should help define the edges or boundaries of this population, and evidence of genetic integration with adjacent populations.

Project Description: Sage-grouse blood, tissue, or feathers will be collected in conjunction with ongoing sage-grouse telemetry study captures and as specifically needed for this study. Samples will be analyzed for genetic characterization that will determine the genetic uniqueness of the Mono/Lyon sage-grouse populations.

Table 2.1 lists areas that have been sampled and areas that remain to be sampled for genetic markers that would support or refute the finding of an Evolutionary Significant Unit. Figure 2-1 shows sampling locations.

Legal Authority: CDFG, NDOW, BLM, USFS, NRCS, BIA, USGS, USFWS

Procedural Requirements: NDOW and/or CDFG certification of field personnel to assure proper handling of sage-grouse and proper collection and handling of sample specimens.

Funding Source: USFWS research grant (potential).

Implementation Process:

1. Agency staff (CDFG, NDOW, BLM, USFS, NRCS, BIA, USGS, USFWS) will develop a 'research needed' proposal to be reviewed by the Bi-State Conservation Planning group.
2. The proposal will be used to solicit contract bids from several universities with genetic research facilities (i.e. UNR, UOD, UCB, UC Davis).
3. The interagency team will search for grant funds.
4. In the interim, the interagency team will continue to collect and store blood, tissue, or feathers when feasible.
5. All future captures within the Bi-State planning area will gather morphometric samples to facilitate the completion of this portion of the study.

Level of Partnership Commitment: The interagency team acknowledges the incredible effort made by Mr. Steve Pellegrini and his students (Yerington High School Science Instructor) who have trapped, sampled, and marked many sage-grouse within Nevada PMUs in coordination with NDOW. The interagency team will continue to coordinate these efforts and provide assistance as needed to insure consistent handling, sampling, and marking protocols are followed throughout the Bi-State planning area.

Table 2-1 Greater Sage-Grouse DNA Sampling: Bi-State Sage-grouse Conservation Planning Area, September 2003.

GEOGRAPHIC AREA OR MANAGERIAL BOUNDARIES	TISSUE/ BLOOD SAMPLES COLLECTED	TISSUE/ BLOOD SAMPLES NEEDED	SAMPLE STATUS (ANALYZED/ NOT ANALYZED)	DETAILS	CONTACTS
Spanish Springs Reserve	6	14	Not Analyzed	Within Washoe/Modoc Planning Unit but needed to determine the Bi-State potential DPS extent.	Steve Pellegrini holds 6 unanalyzed samples. Mike Dobel (NDOW) - sage-grouse location information.
Palomino Valley	1	19	Not Analyzed	Within Washoe/Modoc Planning Unit but needed to determine the Bi-State potential DPS extent.	Steve Pellegrini holds 1 unanalyzed sample. Mike Dobel (NDOW) - sage-grouse location information.
Virginia Range	0	20	N/A	To be added to Bi-State Planning Area. Steve Pellegrini will talk to landowners to determine the potential to trap and sample sage-grouse.	Steve Pellegrini - sage-grouse location information.

Pine Nut PMU	0	20	N/A	Need to collect 20 samples in approx. 3 areas along the Pine Nut Range and to discuss sampling on Reservation Land.	John Axtel (BLM), Walt Mandeville (NDOW, retired), Steve Pellegrini – sage-grouse location information.
Desert Creek/Fales PMU	20 DC 10 SW 16 JA 10W/ B	0	Not Analyzed	20 samples collected by Steve Pellegrini et al. in the Desert Creek area and 10 collected in the northern Sweetwater – both Nevada locations. 16 samples collected in Jackass by CDFG and USGS, and 10 collected in Burcham/Wheeler area by USGS et al.	Steve Pellegrini holds 20 unanalyzed samples. Walt Mandeville (NDOW, retired) sage-grouse location information. Mike Casazza (USGS) holds 22 unanalyzed samples (12 from Jackass, 10 from Burcham/Wheeler; Sonja Taylor (UOD) holds 3 from Jackass and 1 from Wheeler.
Mt. Grant PMU	15	10	Not Analyzed	15 samples collected by Steve Pellegrini et al. in the southwestern portion of the PMU. Need to sample in the Mt. Grant area and to the north of Mt Grant within the PMU	Steve Pellegrini holds approx. 15 unanalyzed samples; Walt Mandeville (NDOW, retired) coordinated sage-grouse location information; Sonja Taylor (UOD) 18 analyzed, taken from the wing tissue collected by NDOW for both Mineral and Lyon counties.
Bodie Hills Hunt Zone	26	0	20+ analyzed	20+ samples were collected via wing samples within the North Mono Hunt Zone which comprises the majority of the PMU. These samples were analyzed by UOD and results are included in Benedict et al. and Sonja Taylor's Masters Thesis. 6 additional samples have been collected by USGS et al.	Sonja Taylor (UOD) 20+ analyzed, holds some unanalyzed samples from the wing tissue. Mike Casazza (USGS) holds 6 unanalyzed samples.

South Mono Hunt Zone and South Mono PMU	31	0	20+ analyzed	20+ samples were collected via wing samples within the South Mono/Inyo Hunt Zone which comprises the majority of the South Mono PMU and the CA portion of the White Mtns PMU. These samples were analyzed by UOD and results are included in Benedict et al. and Sonja Taylor's Masters Thesis. Based up hunter permit data, these wing samples most likely came from Long Valley. 12 samples were taken during trapping operations in the Parker area outside the hunt zone but within the PMU .	Sonja Taylor (UOD) – 20+ analyzed samples, holds some unanalyzed samples from the wing tissue and 2 from resent trapping in the Parker area. Mike Casazza (USGS) – holds 10 unanalyzed samples from the Parker area.
White Mtns PMU	1	19	1 analyzed	1 sample collected by NDOW et al. in the northern Whites and analyzed by UOD and found to be a novel haplotype. Need additional samples in this area. Also need samples from CA side of the Whites and the Truman Meadows area of NV.	Tom Dunn NV BLM Gary Milano (USFS) - sage-grouse location information
Churchhill County NV	18	0	18	18 samples were collected via wing samples taken in Churchhill Co. NV. These samples were analyzed by UOD and results are included in Benedict et al.	Mike Dobel (NDOW) collection Sonja Taylor (UOD)
Nye County NV	20	0	20	20 samples were collected via wing samples taken in Nye Co. NV. These samples were analyzed by UOD and results are included in Benedict et al.	Mike Dobel (NDOW) collection Sonja Taylor (UOD)

Note: Sonja Taylor (UOD) – Holds a total of 181 samples from California. Of those 96 are from Mono and Inyo counties. UOD have extracted DNA from 43 of the 96 samples, approximately 20 each from the Bodie Hills and Long Valley Hunt Zones. CDFG sent 6 additional samples to UOD in February 2003 from Jackass, Wheeler, Parker Bench, Parker Meadows areas.

INSERT FIGURE 2-1

2.4 Risk Assessment and Conservation Strategy Approach

The Bi-State Planning Group was organized into six committees to facilitate local participation, one for each PMU. Each PMU group worked independently to conduct field trips, evaluate sage-grouse habitat condition, identify risks, and formulate conservation strategies to address specific risks. A Technical Advisory Committee (TAC) consisting of professional biologists, land users, and land managers provided direction and definition to the local PMU groups, as needed, to assure consistency and a sound technical approach throughout the plan area.

The methods used for habitat condition assessment were consistent with the recommendations in the Governor's Conservation Strategy and are included in Appendix B. Each PMU group evaluated sagebrush sites and assessed habitat condition according to the Governor's Team definitions. The PMU groups used NRCS Soil Surveys and Ecological Site Descriptions, where available, to identify sagebrush-dominated ecological sites within each PMU.

The following Conservation Strategies provide an overall framework for sage-grouse conservation in the Bi-State Plan area. This framework will be used by land managers and participating private land owners to address the threats and guide the management actions at the local planning level.

1. *Ensure no net loss of sage-grouse breeding populations within the Bi-State Planning Area.*

2. *Maintain and restore (improve) sagebrush and associated habitats critical to the long-term viability of sage-grouse populations within the Bi-State Planning Area.*

3. *Identify and eliminate or substantially reduce threats to sage-grouse populations and habitats within the Bi-State Planning Area.*

4. *Identify and implement scientifically and economically sound management strategies applicable to the management of sage-grouse populations and habitats within the Bi-State Planning Area.*

5. *Identify important data gaps and implement scientific data collection efforts specific to sage-grouse populations and habitats within the Bi-State Planning Area.*

6. *Develop active, well informed local planning groups committed to the development and implementation of sage-grouse conservation actions within the Bi-State Planning Area.*

The PMU Committees identified risks for each PMU. At a minimum, each PMU group considered the population and habitat risks described in the Governor's Conservation Strategy.

The TAC developed and provided a *Risk Assessment Worksheet* to assist the PMU groups in specifying and characterizing existing and foreseeable risks to habitat, populations, local

groups, and individual birds. The Risk Assessment Worksheet provided consistency in the risk evaluation between PMU groups and is included in Appendix 'C'.

When possible, risks were field verified by the PMU Committees and strategies to mitigate risks were formulated. When additional information was needed to verify risks or specify conservation actions to mitigate risks, the additional data needs were identified. In some cases, specific projects and actions have been planned at the local PMU level to address specific risks to sage-grouse and their habitat. Project descriptions are included with the corresponding risk assessment, and include the objective and rationale behind the action, project details, the implementation process, funding opportunities, and the level of partnership commitment. The Conservation Objectives are specific for each project and are quantifiable. Progress toward meeting the Conservation Objectives can be measured and the results can be used in an adaptive management strategy.

The results of the habitat condition assessment, the risk assessment, and the conservation strategies are described for each of the Bi-State PMUs in the following sections.

3.0 PINE NUT PMU

3.1 PMU Description

3.1.1. Location and Boundary

The Pine Nut PMU encompasses the Pine Nut Mountains and is the northernmost PMU in the Bi-State Plan Area, totaling approximately 575,000 acres. The majority of the PMU is east of Highway 395. The PMU boundary follows the Carson River from Carson City east to Highway 95; Highway 95 south to Wabuska; along the Churchill Canyon Road to Lincoln Flat and south to the West Walker River. The south boundary extends into California, encompassing Slinkard Valley to the ridge of the Sierra Nevada Mountains near Woodfords, California. The west boundary extends north to the east side of Gardnerville, Nevada; east of Prison Hill; and back to the Carson River.

3.1.2 Land Ownership and Regulatory Jurisdictions

Land ownership within the Pine Nut PMU is mixed, as shown in Table 3-1. Approximately 79 percent of the PMU lies within portions of Douglas, Lyon, and Carson City Counties in Nevada. The remaining 21 percent is within Alpine and Mono Counties, California. The majority of the area, approximately 60 percent, is public land managed by the Bureau of Land Management Carson Field Office. Approximately one-forth (25 percent) of the PMU is private land that includes approximately 60,000 acres of private Indian Allotment Land. Approximately 12 percent of the PMU is within the Humboldt-Toiyabe National Forest managed by the Bridgeport and Carson Ranger Districts. Two percent is California state land.

Table 3-1. Land ownership within the Pine Nut PMU.

LAND MANAGER OR OWNER	PMU TOTALS		NEVADA		CALIFORNIA	
	Acres	Percent	Acres	Percent	Acres	Percent
Total PMU Acres	**574,373**	100	**454,249**	**79**	**120,124**	**21**
National Forest	70,492	12	14,082	3.1	56,410	47
Private	144,798	25	127,644	28.1	17,154	14
Bureau of Land Management	344,791	60	312,069	68.7	32,722	27
State and County Land	13,758	2	136	< 1	13,622	11

Private Indian Allotment Land – There are approximately 385 individual private Indian allotments within the Nevada portion of the Pine Nut PMU that encompass approximately 60,000 acres. Individual private allotments are approximately 160 acres in size. Fractional ownership is common whereby many allotments have more than 100 owners. These lands are held in trust by the United States Government and managed by the Bureau of Indian Affairs. The BIA Superintendent is the designated Trustee in most cases and is responsible for managing grazing and other natural resources on behalf of the owners. The BIA will be involved with development of sage-grouse conservation activities proposed for allotment lands and will contact the appropriate land owners for approval of specific actions. At the end of a ___response period, the BIA Superintendent can authorize decisions for approval of the final conservation plan and implementation on behalf of the owners. This process can take up to 24 months to complete (Spaulding, 2003).

The Washoe Tribe of Nevada and California has the majority ownership on two Pine Nut allotments. Fish and game law enforcement and hunting on all of the Indian allotment lands is contracted to and managed by the Washoe Tribe Hunting and Fishing Commission.

Wild and Free Roaming Horses - Herd Management Area (HMA) - The Pine Nut Wild Horse Herd Management Area (HMA) lies immediately east of Carson City and is approximately 98,580 acres in size. Approximately 90,900 acres are public land; 7,680 acres are private land. The appropriate herd management level (AML), established in 1995 to maintain a thriving natural ecological balance and multiple use, was determined to range between 118 and179 horses. The population estimate for March 2003 was 439 horses, or more than 270 percent higher than the lower AML limit (BLM 2003). Horses have been routinely observed outside of the HMA. Over the last 20 years, the BLM has removed approximately __horses from inside and outside the HMA as summarized in Table 3-2. During the most recent wild horse gather, July 2003, ___ horses were removed, primarily from the Dayton-Carson City-Fish Springs portions of the HMA, on the west slope of the Pine Nut range (Axtel 2003, personal communication).

Table 3-2. Number of Wild Horses Gathered and Removed from the Pine Nut Herd Management Area.

Year	Number of Horses Gathered	Number of Horses Removed
1977	186	186
1980	140	140
1984	235	235
1985	325	325
1989	208	208
1995	629	410
2003	___	___
TOTAL		1,504 + 2003 horses

The majority of the Pine Nut HMA is not fenced and the southern portion of the HMA overlaps with the northwest corner of the Pine Nut PMU. Five of the seven sage-grouse leks for the north Pine Nut breeding population are included within the unfenced Pine Nut HMA boundary.

Domestic Livestock- Livestock grazing has been a traditional use within the Pine Nut PMU dating back to the 1800s. Recent trends in livestock grazing include:

- Decrease in permitted grazing permits
- Conversion of permits from sheep to cattle
- Completion of allotment management plans

Currently, grazing of domestic livestock is managed by the BLM on public lands and by the BIA on private Indian allotment lands. A summary of current grazing allotment use is given in Table 3-2.

Table 3-2. Grazing Allotments in the Pine Nut PMU

ALLOTMENT NAME	SAGE GROUSE SEASONAL HABITAT1	LAND MANAGER	CLASS OF LIVESTOCK	LIVESTOCK SEASON OF USE
Adrienne Valley		BLM	Cattle	3/1-2/28
Artesia		BLM	Cattle	1/1-2/1*
Buckeye		BLM	Cattle	03/1-2/28*
Buckeye		BLM	Sheep	NA
Churchill Canyon		BLM	Cattle	11/1-5/15
Clifton		BLM	Cattle	1/1-5/31
Clifton Flat		BLM	Cattle	11/1-3/31
Eldorado		BLM	Sheep	11/1-2/28
Fort Churchill		BLM	Cattle	4/1-7/31
Hackett Canyon		BLM	Cattle	3/15-6/30
Hackett Canyon		BLM	Sheep	3/15-6/30
Indian Creek		BLM	Cattle	5/15-11/1
Lincoln Flat		BLM	Cattle	11/1-12/31
Mill Canyon		BLM	Sheep	11/1-3/31*
Pine Nut		BLM	Sheep	6/01-6/30; 7/01-8/31; 11/1-11/30
Rawe Peak		BLM	Cattle	11/1-3/31
Red Burbank		BLM	Sheep	5/1-7/15
Red Burbank		BLM	Cattle	NA
Spring Gulch		BLM	Sheep	3/1-8/15; 12/15-2/28
Sunrise		BLM	Cattle	3/15-6/15
		BIA	The BIA grazing permits are currently expired and are being revised and updated. Grazing on BIA allotments is expected to resume in ____.	
		BIA		
		BIA		
		BIA		
		BIA		
		BIA		

1 Sage-grouse seasonal habitat in each allotment will be verified during the summer of 2005.

Livestock grazing has not occurred within the north sage-grouse breeding habitat since 1987. Sheep grazing occurs in the vicinity of the south breeding habitat during late summer, after the sage-grouse breeding and nesting seasons. Sheep are trailed across the ridges during August. Current sheep herding practices no longer include traditional nighttime bedding grounds, eliminating the concentrated use areas that once were common on sheep ranges (Fulstone 2003, personal communication).

3.1.3 Topography and Climate

The elevation within the Pine Nut PMU ranges from 1,277m (4,190 feet) to 2,879m (9,446 feet). The majority of the PMU (approximately two-thirds) is below 1,981m (6,500 feet). The mountainous terrain is highly dissected with steep canyons. More than half of the PMU is characterized by steep slopes ranging between 15 and 50 percent slope (10^0 - 35^0). All four primary aspects (north, east, south, west) are approximately equally represented within the PMU boundary.

3.1.4 Vegetation Communities and Distribution

The Nevada portion of the Pine Nut PMU is included in portions of the Lyon County, Douglas County, and Carson City Soil Surveys. Ecological site descriptions for Nevada ecological sites are covered under Major Land Resource Areas (MLRAs) 26 and 27. More information can be obtained from the Natural Resources Conservation Service (http//:www.nv.nrcs.usda.gov). The vegetation in the Pine Nut PMU varies from salt desert shrub at the lower elevation to alpine vegetation at the highest elevation.

The salt desert shrub is found at the lower elevations on the north and northeast portion of the PMU starting at about 1,300 meters (4,100 feet). Vegetation includes shadscale *(Atriplex confertifolia)*, Bailey greasewood *(Sarcobatus baileyi)*, bud sagebrush *(Artemisia spinescens)*, Indian ricegrass *(Achnatherum hymenoides)*, bottlebrush squirreltail *(Elymus elymoides*), lupine *(Lupinus* sp.*)*. In the deeper, mesic soils, typically in the drainages, big sagebrush *(Artemisia tridentata tridentata)* community with an understory of Basin wildrye *(Leymus cinereus)* can be found.

As elevation and precipitation increase, the dominate shrubs become Wyoming sagebrush *(Artemisia tridentata wyomingensis)* on the deeper soils and Lahontan sagebrush (*A. arbuscula longicaulis*) on the shallow soils. Associated species with these sites are Anderson peach *(Prunus andersonii)*, Mormon tea *(Ephedra* sp.), Thurber needlegrass *(Achnatherum thurberianum*), desert needlegrass *(A. speciosa),* antelope bitterbrush *(Purshia tridentata)*, phlox *(Phlox* sp.*)*, biscuit root *(Lomatium* sp.*)* and lupine. In a few locations with shallow soils to a calcareous hard pan, black sagebrush (*A. nova*) occurs.

Above 1,875 meters (6,000 foot) in elevation, Lahontan sagebrush transitions to low sagebrush *(A. arbuscula)* on the shallow soils. On the deeper, mesic soils the Wyoming sagebrush transitions into mountain sagebrush *(A. tridentata vaseyana)*. Associated species on these sites include Antelope bitterbrush, snowberry *(Symphoricarpos* sp.*)* currant *(Ribes* sp.*)*, mountain brome *(Bromus marginatus)*, bluegrass *(Poa* sp.*)*, Idaho fescue *(Festuca idahoensis)*, and needlegrass species. A few of the forbs found include balsamroot *(Balsamorhiza* sp.*)*, buckwheat (*Eriogonum* sp.), locoweed, (*Astragalus* sp.) Indian paintbrush (*Castilleja sp*.) phlox *(Phlox* sp.) and lupine.

Scattered among the sagebrush are stands of curlleaf mountain *mahogany (Cercocarpus ledifolius)* found on the dry rocky sites.

Woodlands found in the PMU include single leaf pinyon *(Pinus monophylla)* and Utah juniper *(Juniperus osteosperma)* ranging from the lower elevations up to 2,500 meters (8,000 feet). The pinyon-juniper woodland exceeds its historical distribution and density in the Pine Nut mountains. This especially is the case at the lower and mid elevation where the woodlands continue to encroach into the sagebrush communities. This expansion and an increase in the stand density has resulted in a reduction of the understory herbaceous vegetation component.

In the Carson Range, Jeffrey pine *(Pinus jeffreyi),* white fir *(Abies concolor)*, and western juniper *(J. occidentalis)* woodland are found as elevation increases up to 2,700 meters (8,700) feet.

Interspersed are small reservoirs, creeks, wet and dry meadows, springs and seeps and seasonal dry lakes. Vegetation associated with these areas includes stands of aspen (*Populus tremuloides*), willows *(Salix* sp*.)* and cottonwoods *(Populus* sp*.)* Other species include sedges *(Carex* sp*.)*, lupine, clovers *(Trifolium* sp*.),* wild iris *(Iris* sp*.)* and other associated species.

There are several crested wheatgrass seedings in the PMU. These were either seeded after wildfires, or done in conjunction with Pinyon Juniper chainings. The seedings are found around Sunrise pass and China Springs.

The area has had numerous burns, varying from a few acres to several thousand. Some of the larger burns can be found west of Walker and Coleville, CA., China Springs, Topaz Ranch Estates, Sunrise Pass, and Buckeye Creek, NV. Most of these burns have occurred in Pinyon Juniper vegetation.

3.2 Sage-grouse Habitat Description and Condition Assessment.

Two recent wildfires burned big sagebrush range sites on the east slope of the Pine Nut Mountains, south of Mount Como. The Como fire burned between October 18 and October 31, 2000 and affected 1,767 acres of rangeland. Of the total acres, 400 acres were within the prescribed burn project area designed to reduce fuel loading, increase species diversity, and improve wildlife habitat. The burned area was rehabilitated with a seeding of native and naturalized grasses, forbs, and shrubs including big sagebrush.

The Sunrise fire occurred on the fourth of July 1996 and covered approximately 3,230 acres including approximately 215 acres of interior unburned islands. The majority of the burn occurred on mixed sagebrush rangeland. The burned area was rehabilitated with native and naturalized grasses and forbs. Sagebrush seed was not included in the seed mixture.

3.2.1 Breeding Habitat.

Biologists have identified two distinct breeding populations within the Pine Nut PMU. A large expanse of pinyon and juniper separates the north and south lek sites. It is not know if birds move between the north and south breeding and brood habitat sites or within additional habitat areas that have not yet been specifically identified. There are no distinct barriers that would prevent bird movements between the Pine Nut PMU and the adjacent Desert Creek

PMU to the south. Habitat condition ratings are described in Appendix __. The distribution of sagebrush habitat condition in active breeding habitat is shown on Map 3-__.

The North Pine Nut Breeding Habitat consists of eight leks east of Rawe Peak. Six were relocated and verified in 1993, and two were discovered in 2001. Seven of the eight leks are within approximately one and one-half mile of each other. The eighth lek is within three miles, but is not currently active. Lek number NOPN 7 has been designated as the primary trend lek for the north breeding habitat. The remaining seven leks recorded in the North Pine Nut are believed to be satellite leks, possibly used by subordinate males.

Much of the north breeding habitat area is steep (15-50 percent slope) and rocky, characterized as extremely stony loam, rubble land, and rock outcrop. The suitability of these range sites for sage-grouse nesting and the potential for habitat improvement is limited by stones and cobbles on the surface that would interfere with the use of mechanical equipment (USDA1984).

Flatter areas in the vicinity of the north leks, ranging from 2 to 8 percent slope, are dominated by low sagebrush, with a diversity of forbs and grasses including phlox, aster, buckwheat, groundsel, hawksbeard, milk vetch, mustard, bluegrass, and bottlebrush squirreltail (PMU Committee field trip notes 5/19/02). These low sage sites were rated as key sage-grouse habitat (R0). The majority of the big sage/low sage communities on the east slope of Rawe Peak are characterized by light to heavy encroachment of pinyon and juniper (R3).

The BLM Carson Field Office in cooperation with NDOW and a group of volunteers conducted an intensive field reconnaissance of the north lek area in the spring of 2001. Four nests were found and recorded in low sagebrush habitat. Two nests were within less than one mile of the NOPN4 and NOPN7 leks; one nest was within one mile of the NOPN1 lek; and one nest was within two miles of the NOPN1 lek.

The South Pine Nut Breeding Habitat consists of two documented lek locations, and a third sighting of birds during the breeding season that has not been confirmed as a lek. The south breeding habitat is north of Minnehaha Canyon and west of Red Canyon. No recent strutting activity has been observed in the south breeding habitat area.

Sagebrush habitats west of the leks around Bald Mountain and west to Blossom Spring are a mosaic of big and low sagebrush considered to be key sage-grouse habitat (R0). Northeast of the leks the terrain is steep, dissected and rocky low sagebrush that does not provided desirable nesting conditions. The big sagebrush sites in the vicinity of Mill Canyon and Thompson Canyon are characterized by extensive pinyon juniper encroachment (R3). To the southeast of the leks, in the vicinity of Minnehaha Canyon, sagebrush is lacking as a result of the Holbrook fire (R1).

3.2.2 Summer – Late Brood Habitat.

The Pine Nut PMU is characterized by numerous springs and wet meadows that provide active and/or potential late brood habitat for sage-grouse during the summer, which are briefly described below.

Headwaters Minnehaha Canyon - The meadows in this area are in mixed ownership between BLM public lands and BIA-administered private Indian Allotment lands. Unauthorized livestock grazing has been identified as a concern affecting existing habitat condition.

Mineral Valley Meadows – This area is managed as a grazing allotment by the BIA. Concerns for these meadows include off road vehicle use, pinyon-juniper encroachment, unauthorized grazing by wild horses, stream channel incisement, and the existing road alignment.

Buckeye Meadows / Winter's Mine – This series of stringer meadows runs south from Slater's Mine at the south end of Pine Nut Valley to Winter's Mine. The intermittent meadows are associated with Buckeye Creek and numerous springs east of Mount Siegel. This meadow complex is under mixed ownership that includes private lands, public lands, and Private Indian Allotment land administered by the BIA. BLM manages sheep grazing in this area as portion of the Pine Nut Allotment. The BIA historically managed the area as part of a cattle allotment. Portions of two separate meadows are protected by fenced exclosures that are closed to livestock grazing. The lower exclosure is south of Slater's Mine. The upper exclosure encompasses a portion of the meadow at Winters Mine. Concerns for this area include wild horse use outside of the herd management area, unauthorized grazing, off road vehicle use, and poaching.

Upland areas adjacent to the meadows are a mosaic of big and low sagebrush that appeared on initial evaluation to comprise key sage-grouse habitat (R0).

Sagebrush recovery has not been documented at this time.

Red Canyon – This area is included in the BLM Red Canyon Allotment, which has not been grazed for the last 5 years. The steep topography in this area and woody riparian vegetation brings to question the value of this area as sage-grouse brood habitat.

Blossom Meadow – This area is under mixed ownership that includes BLM public land and private Indian allotment land. The BLM manages cattle grazing in this area on the Buckeye Allotment. There is some concern that the sagebrush perimeter around this meadow is too dense and decadent for optimal sage-grouse habitat. Other concerns for this area include off road vehicle use and the existing road alignment adjacent to the spring.

Big Meadow - This area is public land managed by the BLM. Cattle grazing is managed as part of the Churchill Canyon Allotment. The Big Meadow supports a good diversity of grasses, sedges and forbs including yarrow, milk vetch, dandelion, milkweed, and monkey flower. Concerns for this meadow include the relative composition of wiregrass (*Juncus balticus)* and wild iris (*Iris missouriensis)* and the presence of Canada thistle (Cirsus *canadensis*), a noxious weed. The BLM is currently using herbicide treatments for control of Canada thistle. This area is monitored annually during the sage-grouse brood counts. NDOW has documented an upward trend in the number of birds seen at this location over the last 10 years. However, monitoring has not been sufficient at this site to estimate mean brood size for the population, or make inferences regarding nesting success. Biologists speculate that the birds using this meadow may have bred and nested in the north breeding habitat area.

Sagebrush cover adjacent to the Big Meadow is lacking on the west perimeter as a result of the recent Como and Sunrise fires. These burned areas have been reseeded but are currently lacking sagebrush cover (R1). Sagebrush sites on the unburned east side of the meadow are providing required escape cover and summer roosting habitat. However, these sagebrush stands appeared to be aging beyond the optimal conditions for sage-grouse habitat and should be evaluated for their potential to respond to habitat improvement treatments.

3.2.3 Winter Habitat.

The sage-grouse wintering areas for the Pine Nut PMU are currently unknown. Observations of grouse at high elevations such as Bald Mountain have been documented during October and November. Sightings between December through February have included Jack Wright Summit.

3.3 Sage-grouse Populations

Data generally used to estimate population size and demographics are lacking for the Pine Nut PMU. Strutting grounds were first recorded and inventoried in the Pine Nut Mountains in 1993. However, since then, lek counts have not been regularly or systematically conducted until recently.

3.3.1 Historical Trends

Hunting has not occurred consistently in the Pine Nut PMU since 1971, and harvest data are limited. There have been only twelve open hunting seasons over a thirty-year period. Only limited harvest data for the south breeding population have been compiled as summarized in Table 3-3.

Table 3-3. Hunter success from the Douglas County portion of the Pine Nut PMU between the 1970s and the 1990s.

NUMBER OF HUNTING SEASONS PER DECADE		MEAN HARVEST PER SEASON	MEAN NUMBER OF REPORTED HUNTERS PER SEASON	MEAN NUMBER OF BIRDS PER HUNTER PER SEASON
1970s	5 Seasons	132	`120	1.1
1980s	2 Seasons	99	86	1.2
1990s	4 Seasons	23	34	0.7

The limited harvest data available cannot be used to derive even a vague description of the historic population trend. No comparison of hunter success between the decades has been analyzed. Numerous factors could affect hunter success in addition to the bird population status. These should be considered with the harvest data prior to drawing conclusions. Some of the covariant variables that are inherent in the harvest data include climate,

duration and timing of the hunting season, and age and experience of the hunter, to name a few.

Brood survey data for the Pine Nut PMU are also limited as summarized in Table 3-4. Inconsistent survey intensity, climate, and other factors affect the interpretation of population trend from the existing brood data. The overall average number of birds observed during brood surveys between the 1960s and the 1990s is 35 birds and an overall ratio of 2.1 chicks per hen.

Table 3-4 Brood Survey Data from the Pine Nut PMU between the 1970s and the 1990s.

NUMBER OF YEARS SURVEYED PER DECADE		MEAN NUMBER OF BIRDS OBSERVED	MEAN NUMBER OF CHICKS PER HEN
1960s	3	27 or 23?	4 or 6.8 ?
1970s	5	21	1.9
1980s	8	52	2.5
1990s	4	39	1.6

3.3.2 Current Distribution

The most recent population estimate from Nevada Division of Wildlife (NDOW) for the north population is 260-450 birds. These estimates are based upon 2-year average lek count data from the years 2002 and 2003. The procedures used by NDOW to estimate the population from the lek data are included in Appendix E. Current data for this PMU are showing that the north Pine Nut population is stable, showing signs of upward trends, but still well below historic levels. NDOW credits wise range management as benefiting the North population.

NDOW observations indicate that there is also a viable breeding population at the south end of the Pine Nut Range. The south end of the range is generally inaccessible during the strutting period and lek count data are minimal. Brood surveys conducted in this area are evidence that the population exists. However, consistent data are insufficient to reliably estimate the population size of the south breeding population.

The earliest lek monitoring data for the North Pine Nut date back to 1993 when six leks were counted from a helicopter on one day in late April. The number of birds per lek ranged between 4 and 10 males. The most birds seen at one lek was 15 (mixed sexes).

The next recorded lek count occurred in mid-April 2002. None of the six leks previously counted in 1993 were active. In 2001, two new leks were discovered in the North Pine Nut with 8 males on NOPN 8 and one male on NOPN7. During the last two years, the leks in the north breeding habitat have been monitored by NDOW, BLM, and volunteers. The historic lek count record for the Pine Nut PMU is given in Table 3-5.

Table 3-5 Historic Lek Count Data from the Pine Nut PMU between1993 and 2003.

LEK ID NUMBER	YEAR DISCOVERED	COUNTY	ACTIVITY WITHIN THE LAST 5 YEARS
NOPN1	1993	Lyon	Unknown
NOPN2	1993	Lyon	Unknown
NOPN3	1993	Lyon	Unknown
NOPN4	1993	Lyon	Unknown
NOPN5	1993	Lyon	Unknown
NOPN6	1993	Lyon	Unknown
NOPN7	2001	Lyon	Active
NOPN8	2001	Lyon	Unknown
NOPN9	2003	Lyon	Active
NOPN10	2003	Lyon	Active
SOPN1	1993	Douglas	Unknown
SOPN2	2002	Douglas	Active

** ”ACTIVE” leks are those where male birds have been observed during the strutting season within the last 5 years.

3.4 Pine Nut PMU Risk Assessment and Conservation Actions

Existing and foreseeable risks for the Pine Nut PMU include pinyon-juniper encroachment, wildfire, predation, power lines, urbanization, off-road vehicle use, wild horses, livestock grazing, poaching, and pronghorn antelope grazing. Each risk is discussed in detail below.

3.4.1 Pinyon-Juniper Encroachment

Pinyon-juniper encroachment onto sagebrush range sites is occurring throughout the Pine Nut PMU. Many of the ecological sites that support big sagebrush have been converted to pinyon-juniper woodlands over the last 100 years. Of particular concern is the replacement of needed big sagebrush habitat on the west slope of Rawe Peak near the North Lek Area, throughout Pine Nut Valley, and the area around Thompson and Mill Canyons in the vicinity of the South Lek Area. Pinyon-juniper encroachment affects sage-grouse habitat quality and habitat quantity. In the Pine Nut PMU, it is impacting potential nesting and early brood habitat in multiple sites by reducing the availability of big sagebrush near leks. Pinyon–juniper encroachment may also be affecting the connectivity between the north and south breeding populations.

The impacts are predicted to become permanent and irreversible without appropriate management. If pinyon-juniper encroachment is not managed in these areas, a permanent change of the site potential can occur that would alter plant successional pathways and preclude the natural recovery of the sagebrush ecosystem. If sagebrush and its associated

herbaceous understory are replaced, recovery of sagebrush sites to desirable sage-grouse habitat will require significant human intervention and expense.

Additional Data Needs to Verify and Further Characterize the Risk:

- On-site inventories are needed to rank the "stage" of encroachment and identify sites with the highest potential for recovery if trees are removed.

- Coordination is needed with the Bureau of Indian Affairs, the private Indian allotment owners and the Washoe Tribe to evaluate the potential for tree reduction treatments on private Indian allotment lands. The Washoe Tribe has expressed interest in fuel reduction in the past for protecting old growth pinyon stands in the Pine Nut range. The Washoe Tribe Environmental Protection Department is currently implementing a BIA woodland grant project to remove infected trees and improve woodland health on two private Indian allotments at the south end of the Pine Nut Range.

- Coordination is needed with Carson City and local businesses that are developing biomass utilization plants to identify biomass disposal alternatives.

- Coordination with the Nevada Division of Forestry is needed to evaluate the efficiency of using inmate crews to treat areas and remove pinyon-juniper.

Conservation Action: Pinyon And Juniper Tree Removal

Risk: Optimal nesting habitat in the vicinity of leks is limited by lack of big sagebrush sites due to habitat type conversion from big sagebrush to woodland.

Objective: Reestablish big sagebrush habitat for nesting and early brood-rearing on sites that can and previously did support big sagebrush vegetation. Reestablish a big sagebrush habitat corridor between the north and south breeding areas.

Action: Reclaim approximately 30,000 acres of sagebrush habitat over a 15-year period. Treatments will be phased spatially and temporally to produce a mixed-age mosaic of sagebrush habitats.

Rationale:

Legal Authority: BLM Carson Field Office and Indian Allotment owners, and the Bureau of Indian Affairs.

Procedural Requirements: BLM

1. Field-verify and survey project area to delineate sagebrush ecological sites, stage of Pinyon- Juniper encroachment, and existing understory composition of forbs and grasses.
2. Comply with NEPA requirements to analyze the pinyon-juniper tree removal project and potential project alternatives.
3. Develop biomass utilization plan.
4. Schedule and implement treatments over a 15-year period.

Procedural Requirements: BIA

1. All of the above, plus...

2. Notify all allotment owners of proposed action.
3. Obtain approval from owners or BIA Supervisor.

Level of Partnership Commitment:

Funding Source: BLM ; conservation grants
Funding opportunities will be identified to coordinate with ongoing, funded programs such as the Healthy Forest Initiative, and biomass- energy development initiatives.

Implementation Process:
1. Project Planning: 2003 for 2005 budget
2. Project Implementation Spring 2005
3. Project Monitoring: 3-year intervals

Project Area Locations:
Public Land bound by T 13 N to T 15 N and R 21 E to R 23 E
Public Land bound by T 12 N to T 14 N and R 21 E to R 23 E
Indian Allotment Land bound by T 11 N to T 13 N and R 21 E to R 23 E

3.4.2 Predation

Increases in predator populations over the past several decades have been attributed to reduced professional predator management, reductions in the commercial fur trapping industry, and protection of predator species. One example of this trend is the common raven. Boarman and Berry (1995) reported that raven populations had increased from 500 to 7,600 percent in some areas of the Western United States from 1968 to 1992 Large predators, including mountain lions and black bears, are commonly seen throughout the Pine Nut PMU. While these large predators species may not directly impact sage-grouse, additional pressure on the prey populations affects all predator species (Mandeville 2003). Some of the predators in the Pine Nut PMU that commonly prey on the birds and/or consume their eggs include foxes, coyotes, bobcats, badgers, skunks, raccoons, ground squirrels, and multiple avian species (corvids and raptors).

Direct evidence of coyotes and ravens hunting on the north lek was recorded by lek surveyors during the strutting season in 2003 (J. Alexander, NDOW Volunteer, 2003). While it is true that sage-grouse are a natural prey species for indigenous predators, the seriously low sage-grouse population in the Pine Nut range is much more susceptible to the loss of adult birds and low juvenile recruitment to the population.

Sage-grouse predation can occur in several ways and from a host of species, especially during their most vulnerable time of year, breeding through brood-rearing. Sage-grouse can be easily detected and killed on leks. Females can be sighted leaving and returning to nests during incubation. Nests can be robbed of eggs. Young chicks are easily detected and killed during the first few weeks of their lives.

Nesting and early brood-rearing habitat within three miles of the north lek complex is primarily low sagebrush. While this ecological site produces abundant forbs in years with good spring moisture, the structural character of the sagebrush is limiting. The mean sagebrush height in this area is approximately 9-inches (RCI 2003). Changes in management will not result in taller shrubs.

Big sagebrush sites within the nesting range of the north lek are encroached with pinyon and juniper. Improvement of these encroached sites to reestablish optimal nesting habitat will take a minimum of 5 to 20 years to become established and be available as high quality nesting habitat for sage-grouse.

Conservation Action: Species Protection

Risk: Currently low sage-grouse population levels and marginal nesting habitat in the vicinity of the north lek complex increase the impacts of predation on the sage-grouse population. Losses of individual adult and juvenile bird have a direct impact on population viability.

Objective: Assist the sage-grouse population during the breeding and early brood rearing periods to, at a minimum, maintain their current level by providing sage-grouse protection from predation for the interim period until habitat improvement projects become established.

Rationale: The long term solutions to minimizing the impacts of sage-grouse predation are 1) increase the population size, and 2) provide more secure nesting and early brood-rearing habitat. However, even if habitat improvement projects are implemented immediately, there will be a delay of years or decades before desirable habitat is reestablished. During that time the population may continue to decline as a result of adult mortality and low recruitment. In the interim, controlling targeted predators (when predator populations have been monitored, and if control has been demonstrated to benefit sage-grouse during the vulnerable time of year, March through June), will reduce the exposure of birds to high levels of predation. The anticipated result would be maintenance or possible increase of the population size.

Project Description: The sage-grouse protection project would take place on the Nevada side of the Pine Nut PMU, and would be implemented across all land ownerships and jurisdictions. The project will be supervised and implemented by professional animal damage control biologists. USDA Wildlife Services (WS), the nation's leading agency in wildlife damage control to protect species of special concern, will be contracted to manage the Pine Nut project. NDOW and the Washoe Tribe Wildlife Commission will oversee the project and approve annual plans. Each year of the project, prior to initiating protection and throughout the protection season, WS will conduct predator surveys to identify target predator populations and monitor predator population trends.

WS will submit the results of this project to the Washoe Tribe Wildlife Commission and to NDOW in their annual report at the end of the protection season. NDOW will make the results available to the public in their annual Predator Management Plan. This information will be used in conjunction with ongoing sage-grouse population monitoring to determine the effectiveness in stabilizing or improving sage-grouse population trends.

As a pilot project, the sage-grouse protection project will be implemented for an initial 5-year period. Data compiled during this pilot period will include sage-grouse population trend, predator population trend (annual and seasonal), and habitat improvement success.
At the end of the 5-year trial pilot period, the effectiveness of meeting the project objectives will be evaluated. If successful and necessary, the project will continue until habitat restoration objectives are met.

Legal Authority: NDOW, Washoe Tribe Wildlife Commission, BLM, private land owners.

Procedural Requirements: - insert information from WS here –

Funding: Funding would be pursued from private wildlife interest groups, NDOW, and others.

Implementation Process: (To be further developed with WS and NDOW)

1. Write the detailed implementation and monitoring plans in conformance with other species protection projects conducted by NDOW.
2. Formalize proposals to NDOW and Washoe Tribe Wildlife Commission.
3. Contract with WS to implement the Pine Nut Sage-grouse Protection Project.
4. Report annual results.
5. Determine the need for continuing or terminating the project.

Level of Partnership and Commitment:
Bureau of Indian Affairs - in progress.

3.4.3 Urbanization (Residential Development)

Increased human presence in sage-grouse habitat occurs with urban expansion and increases risks to habitat quality, habitat quantity, and sage-grouse populations. Carson City, the Johnson Lane area of Douglas County, Fish Springs, Topaz Ranch Estates, Wellington, Minden, Gardnerville, Dayton, and Smith Valley are continuing to expand. Private land values are escalating and the potential for subdivisions and residential development is increasing.

Unrestricted road access throughout the Pine Nut PMU provides the potential for increased human presence in critical habitats during critical times of the year. People particularly affect nesting, early brood, and late brood habitat during spring through fall where critical habitats are easily accessed by vehicles. Increased human presence disrupts daily activities for individual birds and broods. Management of this risk is somewhat unpredictable due to current limitations on enforcement of existing laws.

Additional Data Needs to Verify and Further Characterize the Risk:

- Identify existing zoning and master plan elements for private lands within and adjacent to the PMU.

- Consult with the BIA and Washoe Tribe to determine if there are any foreseeable plans for development on the private Indian allotment lands. Consult with BIA to determine the possibility of establishing conservation easements on Indian allotments.

- Consult with private land owners within the PMU to determine their interest in conservation easements and other USFWS conservation programs for private land owners.

Conservation Strategy - The risk of disturbance to sage-grouse from increased human presence can be mitigated in the future by developing conservation agreements, modifying zoning ordinances, and restricting seasonal access to critical habitats during critical times of the year.

Access on roads in breeding and nesting habitat should be seasonally restricted between February 1 and May 15. Substantial penalties should be invoked for unauthorized trespass on seasonally restricted roads.

Public education is an additional approach to mitigating the impact of human activity in critical habitats by increase public awareness of sage-grouse conservation. Educational programs that focus on elementary schools can have long-term benefits.

Revisions to existing zoning and master plans should be evaluated where applicable to curtail expansion of urban development into suitable sage-grouse habitats.

Conservation Action: Conservation Agreements for Late Brood Habitat and Corridors

Risk: The majority of the active late brood habitat, particularly in the vicinity of the south lek area, is private land or private Indian allotment land. The perpetuity of these critical habitat areas depends upon protecting these lands from future urban development. The connectivity between the Pine Nut PMU and the Desert Creek PMU to the south is also in potential jeopardy if urban development continues in critical linkage areas.

Objective: Secure conservation agreements with property owners that will protect the existing habitat values that are critical to sage-grouse for the late summer brood period, and areas that will preserve the connectivity between the Pine Nut and Desert Creek PMUs.

Rationale: Urban development is progressing at a rapid pace in all locations surrounding the Pine Nut PMU. The long term viability of sage-grouse in the Pine Nut PMU depends upon maintaining viable late brood habitat. Long-term viability of the Mono/Lyon population may depend upon preserving connectivity between the Pine Nut and Desert Creek PMUs.

Project Description: Secure conservation easements to maintain existing habitat values that are critical to sage-grouse for the late summer brood period including private land along Pine Nut and Buckeye Creeks, and private Indian allotment lands in the Double Springs area.

Secure conservation easements in areas that will preserve the connectivity between the Pine Nut and Desert Creek PMUs. These may include private Indian allotment lands in the Double Springs area and private land from the Walker River, north to Jacks Wright Summit.

Legal Authority: BLM, land conservancies, private land owners.

Procedural Requirements: In progress.

Funding: Private wildlife interest groups, USFWS, BLM, NRCS
Funding opportunities will be identified to coordinate with ongoing, funded programs such as the Healthy Forest, wildfire risk reduction, and biomass- energy development initiatives.

1. Implementation Process:
2. Pursue willing parties who are interested in long term sage-grouse conservation including private land owners and administrative agencies.
3. Pursue funding for Conservation Easements.

4. Negotiate agreements or transactions with private land owners to provide assurances that private property with critical habitat values are not developed or degraded.

Level of Partnership Commitment:
USFWS Conservation Agreements with Assurances:
Douglas County
Lyon County
Carson City

3.4.4 Wildfire

Lightning strikes, controlled burns, or human negligence ignite wildfires within the Pine Nut PMU nearly every year with the potential to remove critical sagebrush habitats. Big sage / low sage mosaic habitat within the Pine Nut PMU for wintering, brooding, and nesting is currently in desirable condition for sage-grouse use, but is limited. If these habitats are lost in a wildfire, successful reclamation will take an average of 10 to 20 or more years to reestablish suitable sagebrush sites for cover and food. Under worst-case conditions, burned sagebrush sites can be converted to annual grasslands dominated by cheatgrass, thus permanently impacting the potential for sagebrush reestablishment. Any further loss of big sagebrush habitat within the Pine Nut PMU will have a negative impact on sage-grouse recovery.

The risk of wildfire in the Pine Nut PMU will directly affect habitat quality, habitat quantity, and sage-grouse population. Yearlong, nesting, brood, and winter habitats can be affected at multiple sites. The risk of wildfire is seasonal, and the impacts are predictable. While lightning strikes cannot be controlled, the risk of habitat destruction can be reduced through pre-suppression strategies to create firebreaks and reduce fuels in critical habitat. Mitigation of the risk is manageable and expensive.

Additional Data Needs to Verify and Further Characterize the Risk:

- If available, historic aerial photographs should be evaluated to verify pinyon-juniper encroached sagebrush sites.

- Fire behavior modeling and risk assessments are needed in the vicinity of critical habitats to evaluate the need for and design fuel reduction treatments and firebreaks.

- Coordination is needed with Carson City Biomass initiative and local businesses that are interested in biomass utilization to identify biomass disposal alternatives.

- Coordination with the Nevada Division of Forestry is needed to evaluate the efficiency of using inmate crews to implement fuel reduction treatments.

Conservation Strategy - Initiate fuel reduction treatments and construct firebreaks in conjunction with the National Fire Plan to reduce the risk of habitat destruction and potential habitat conversion to cheatgrass. Maintain firebreaks with controlled grazing on an annual basis to control the build up of fuels.

Both natural-caused and prescribed fires should be managed to protect and optimize sage-grouse habitat to the maximum extent possible. Known critical sage-grouse habitat, particularly big sagebrush sites, should be designated for full fire suppression status.

Wildfire rehabilitation plans should emphasize sagebrush reestablishment on sagebrush ecological sites. If burns occur in sage-grouse nesting habitat, post fire management should favor reestablishment of nesting habitat.

Prescribed burns should not be allowed in Wyoming big sagebrush sites without the recommendations and approval of range ecologists as being the best alternative for recovering poor condition habitat.

Monitoring results of the existing seedings on the Como and Sunrise burns should be used to assure big sagebrush reestablishment. Inter-seeding with additional sagebrush seed should be initiated if necessary to speed the rate of sagebrush recovery.

3.4.5 Off Road Vehicle Use and Existing Road Alignments

Organized off-road vehicle races have been permitted in the past on Memorial Day and Labor Day weekends. Memorial Day race routes that have included portions of the Churchill Canyon Road in between the North Lek Area and the Big Meadow are of most concern for the sage-grouse population. Young broods are expected to be using this area during this time period. Impacts from these events can affect individual and multiple birds by direct mortality or by disturbances to broods that cause chicks to become separated from hens, also resulting in chick mortality. This risk is both manageable and predictable and can be mitigated inexpensively.

Some existing roads traverse meadow habitats causing accelerated erosion and jeopardizing the condition of late brood habitat.

Conservation Strategy - Appropriate clearance through the NEPA process for all organized racing events should include specific analysis of impacts to sage-grouse. Approved race routes should avoid critical sage-grouse habitat during critical seasons. Race courses should not be allowed in breeding and brood habitat until after June 15 and September 15, respectively.

Unorganized ORV use should be limited to existing roads and trails in sage-grouse habitat.

Conservation Action: Road Realignment – Maddy Roach Spring

Objective: Reverse the downward trend of the meadow by repairing road-caused damage, and realign the road through an upland area outside the meadow.

Rationale: The existing road is contributing to the downward trend and at-risk condition of Maddy Roach Spring. Repairing the existing damage can be accomplished without extensive engineering or inputs and at reasonable cost. Realigning the road outside of the meadow will achieve long term improvement and maintenance of late brood habitat.

Project Description**:** Realign public road on private property.

Legal Authority: Private land owner.

Procedural Requirements:
Obtain advice from professional land conservancies and Douglas? Lyon? County

Funding: NRCS, private land owner, conservation funds

Implementation Process:
1. Open negotiations with private land owner
2. Project cost estimate
3. Secure funding
4. Design
5. Environmental clearance
6. Construction

Level of Partnership Commitment:
Pending

3.4.6 Power Lines
The North Pine Nut Lek Area is bordered on two sides with existing power lines that are located within 2-3 miles of active strutting grounds and within less than one mile of an active nesting site. Existing strutting grounds and nest sites are within the hunting territory of ravens that may be nesting on existing power poles. New power lines have been requested within the Pine Nut PMU area.

The risk of power lines to sage-grouse is in terms of increasing avian predations. Ravens are know to depredate sage-grouse during the nesting and early brood stages. Ravens were observed "hunting" over active sage-grouse leks during the 2003 breeding season. The risk may be mitigated by improving existing and/or creating additional nesting and early brood habitat in areas away from potential raven nest sites (See Pinyon-Juniper Encroachment Section 3.4.1).

Conservation Strategy - Provide improved nesting habitat by rehabilitating big sagebrush sites encroached with pinyon-juniper.

Limit power line expansion to existing corridors.

3.4.7 Wild Horses
The herbaceous vegetation in this area was observed to be heavily grazed by wild horses in May 2002 when more than 40 horses were observed within a mile of the leks (Pine Nut PMU Committee). Livestock have not grazed this area (Mill Canyon Allotment) since 1987. The Pine Nut Herd has approximately two times the AML and is expanding well outside the HMA boundary.

Wild horses compete for herbaceous vegetation in the north breeding habitat, resulting in risks to habitat quality in nesting and early brood sites during the spring. This risk is manageable and predictable, but expensive and complex to address.

Conservation Strategy – The ongoing need for regular removal of wild horses from the HMA has been well documented by the BLM. Reducing the wild horse numbers to the AML and monitoring the effects of a managed horse herd on sage-grouse breeding and early

brood habitat will be necessary to evaluate the effects of competition and disturbance by horses. Horses should be removed from the Pine Nut PMU by whatever means available and managed to maintain AML. Vegetation trends, particularly forb and grass composition, and sage-grouse population numbers should be monitored to evaluate the impacts of a managed horse herd on sage-grouse habitat.

3.4.8 Livestock Grazing

Both cattle and sheep graze public lands in the Pine Nut PMU in accordance with allotment management plans and permits administered by the BLM Carson city Field Office. Additional sheep and cattle grazing, primarily in the south part of the PMU is permitted on private Indian allotment lands administered by the BIA.

On private Indian allotment lands, enforcement of permit conditions, seasons of use, numbers of livestock, and trespass onto adjacent, unfenced public land has been a concern for sage-grouse summer / late brood habitat for the south population. Overgrazing on stringer meadows can affect forb availability and concealment cover for sage-grouse.

The current status of public land grazing within the PMU is managed such that it is not known to be impacting sage-grouse breeding habitat, summer / late brood habitat, or populations at this time. Grazing on private Indian allotment lands is currently being reviewed in cooperation between the BLM and Bureau of Indian Affairs (BIA).

Conservation Strategy – Maintain exclosure fences. Continue to manage livestock grazing in compliance with the Sierra Front/ Northwestern Great Basin Resource Advisory Council Standards and Guidelines to accomplish four fundamentals of rangeland health:

- Watersheds are in properly functioning condition;
- Ecological processes are in order;
- Water quality is in compliance with State Standards; and
- Habitats of protected species are in order.

Coordination between the BLM and the BIA to establish season of use and class of livestock consistencies on adjacent allotments will facilitate permit enforcement and reduce the potential for livestock trespass.

3.4.9 Poaching

Sage-grouse hunting is illegal everywhere within the Pine Nut PMU. Any take of sage-grouse from within the PMU constitutes poaching. There are no recent accounts of sage-grouse poaching within the PMU, although law enforcement has been light. It is highly suspected that poaching does occur. NDOW has documented that the risk of illegal hunting increases in close proximity to urban areas.

Conservation Strategy - Increase signage within the PMU clarifying the area to be closed to sage-grouse hunting and listing contact information for "Operation Game Watch." Substantially increase penalties for illegal take of sage-grouse. Designate that additional money collected for sage-grouse poaching fines is earmarked for sage-grouse habitat conservation.

3.4.10 Pronghorn Competition

Pronghorn antelope were recently introduced into the Pine Nut PMU. A total of 91 animals were released in 1999 and 2000. The current population is estimated at 130-160 animals.

Pronghorn eat forbs when available and have a dietary overlap with sage-grouse, particularly chicks, during the spring and summer. Pronghorn potentially compete with sage-grouse on a seasonal basis, especially during drought years when annual forb production is low.

Conservation Strategy - Competition between sage-grouse and pronghorn is not a problem at this time. Ongoing habitat monitoring programs are needed to evaluate the trend of forb composition and utilization where antelope and sage-grouse use areas overlap. Pronghorn populations should be managed to maintain population levels at the designated desired level (200) to maintain compatibility with existing multiple uses.

3.4.11 Noxious Weeds and Invasive Vegetation Species

Noxious weeds and cheatgrass are invading sagebrush and wet meadow range sites throughout the Pine Nut PMU. Of particular concern are areas consumed by wildfires, and places perpetually frequented by the public. All invasive exotic plant species negatively affect sage-grouse habitat quality and quantity by replacing desirable plants needed for forage and cover.

If ignored, the impact of invasive plants is predicted to become permanent and irreversible. Plant community succession will be altered to the point that natural recovery of native habitat would be impossible. Partial recovery of converted sites would require significant and expensive human intervention to recreate favorable conditions for sage-grouse.

Additional Data Needs to Verify and Further Characterize the Risk:

- Continuous inventories are needed across all land ownerships/jurisdictions to identify infestations with the highest potential to invade critical sage-grouse habitat.

- Continued coordination and cooperation between all agencies/owners of lands within the Pine Nut PMU to implement prompt weed eradication and Burned Area Emergency Rehabilitation (BAER) projects as necessary. Implementation of these projects would optimally give sage-grouse use areas the highest priority.

- Continued education for the public in the identification and ecological impacts associated with invasive plant species. Special emphasis should be placed on the transportation and establishment of new infestations by human behaviors and how they can be minimized.

- Coordination with the Nevada Division of Forestry to implement noxious weed eradication projects using honor camp inmate crews.

Conservation Strategy - Most major landowners and land management agencies are currently engaged in cooperative weed management practices across the Pine Nut PMU. These efforts should continue while also expanding the educational needs of the public in order to minimize noxious weed impacts to all resources and subsequent land users.

3.4.12 Energy Development - Wind

Approximately 15 percent of all the wind energy produced in the nation comes from federal lands. Thirteen sites have been authorized in Nevada for monitoring wind; three of these are in the Pine Nut range. Monitoring can take up to 1.5 years. If the conditions are favorable, turbines could be operating as early as 2007. Wind-generated power facilities are of concern to sage-grouse conservation because the infrastructure includes roads and power lines that can fragment habitat, increase human presence, and facilitate predation.

4.0 DESERT CREEK – FALES PMU

4.1 PMU Description

4.1.1 Location and Boundary

The Desert Creek - Fales PMU is approximately 568,000 acres in size and includes land in both Nevada (55 percent) and California (45 percent). The majority of the area encompasses the Sweetwater Mountains along the California/Nevada state line. The Pine Grove Mountains border the Desert Creek - Fales PMU to the east, and a portion of the Sierra Nevada Mountains denotes the west boundary. The PMU contains portions of the both the West and East Walker Rivers. The East Walker River demarks the southeast PMU boundary. Towns within the PMU include Bridgeport, California, which marks the southeast corner; Walker, California on the west boundary; and Wellington, Nevada on the northwest boundary.

4.1.2 Land Ownership, Land Uses and Regulatory Jurisdictions

The vast majority of land within the Desert Creek – Fales PMU, 87 percent, is National Forest land managed by the Humboldt-Toiyabe National Forest Bridgeport Ranger District. Most of the remaining lands within the PMU, 11.6 percent, are privately owned. The Bureau of Land Management manages one percent of the PMU. The remaining 0.4 percent of the PMU is California State and Mono County lands. The southwest corner of the PMU is within the Hoover Wilderness area. Land ownership is summarized in Table 4-1.

Table 4-1. Land ownership in the Desert Creek – Fales PMU.

LAND MANAGER-OWNER	PMU TOTALS		NEVADA		CALIFORNIA	
	Acres	Percent	Acres	Percent	Acres	Percent
Total PMU Acres	**567,992**	**100**	**310,189**	**55**	**257,803**	**45**
National Forest	493,612	87.0	278,426	90.0	215,187	83.4
Private	65,716	11.6	31,763	10.0	33,953	13.2
Bureau of Land Management	6,110	1.0			6,110	2.4
State and County Land	2,552	0.4			2,552	1.0

Land uses in the PMU include livestock grazing, recreation (motorized and non motorized), hunting and fishing, agriculture, mining/gravel, rural residential, small towns and utility and transportation corridors.

Livestock grazing of both cattle and sheep occur on portions of the National Forest lands, with the majority occurring in the Sweetwater Mountains. Grazing is mainly during the summer with a few areas available for winter grazing. Grazing also occurs on ranch lands year round. Recreation occurs as dispersed motorized and non motorized. The majority of recreation activity occurs in the portion of the PMU that is in the Sierra Mountains. Fishing is a common recreational activity that occurs along the rivers and creeks found in the PMU. Hunting includes mule deer and game birds. Sage-grouse hunting is closed in the PMU. Agriculture consists of mainly hay production and livestock grazing. Mining is a minor component. Rural residential is a growing land use in the PMU. Localized areas include Smith Valley, Sweetwater summit, Antelope Valley, Bridgeport, and Highway 395 from Bridgeport to Fales. There are two main transportation corridors, highways 395 and 338. A utility corridor also follows Highway 395.

4.1.3 Topography and Climate

Elevations range from 1,372m (4,501 feet) to 3,609m (11,840 feet). Approximately two-thirds of the PMU lies between 1,982m (6,500 feet) and 2,743m (9,000) feet. More than half of the Desert Creek – Fales PMU (55 percent) is characterized by steep slopes ranging between 10 and 35 percent. The remaining 42 percent of the area consist of gentle slopes and flats. Approximately three percent of the PMU is very steep slopes, scarps, and cliffs. The predominant aspects are north, east, and west. The two highest peaks are Wheeler Peak at 11,663 feet in the Sweetwater Mountains and Buckeye ridge at 11,849 feet in the Sierras.

4.1.4 Vegetation Communities and Distribution

The vegetation in the Desert Creek – Fales PMU varies from salt desert shrub at the lower elevation to alpine vegetation at the highest elevation.

The salt desert shrub is found at the lower elevations on the northeast portion of the Sweetwater and Pine Grove Mountains. Vegetation includes shadscale *(Atriplex confertifolia)*, Bailey greasewood *(Sarcobatus baileyi)*, bud sagebrush *(Artemisia spinescens)*, Indian ricegrass *(Achnatherum hymenoides)*, Bottlebrush squirreltail *(Elymus elymoides*), lupine *(Lupinus spp.)*. In the deeper, mesic soils, typically in the drainages, big sagebrush *(Artemisia tridentata tridentata)* community with an understory of Basin wildrye *(Leymus cinereus)* can be found.

From this vegetation zone going up in elevation and precipitation are the Wyoming sagebrush *(Artemisia tridentata wyomingensis)* on the deeper soils and Lahontan sagebrush (*A. arbuscula longicaulis*) community on the shallow soils. Associated species with these sites are Anderson peach *(Prunus andersonii)*, ephedra *(Ephedra spp.*), Thurber needlegrass *(Achnatherum thurberianum*), desert needlegrass *(A. speciosa),* antelope bitterbrush *(Purshia tridentata)*, phlox *(Phlox spp.)*, biscuit root *(Lomatium spp.)* and lupine.

Above the 6000-foot elevation the Lahontan sagebrush goes to low sagebrush *(A. arbuscula)* on the shallow soils. On the deeper, mesic soils the Wyoming sagebrush goes into Mountain sagebrush *(A. tridentata vaseyana)*. Associated species on these sites include antelope bitterbrush, snowberry *(Symphoricarpos spp.)* currant *(Ribes spp.)*, mountain brome *(Bromus marginatus)*, bluegrass *(Poa spp.)* species, Idaho fescue

(Festuca idahoensis), and needlegrass species. A few of the forbs found include wyethia *(Wyethia spp.)*, balsamroot *(Balsamorhiza spp.)*, phlox and lupine. In the more mesic soils with a seasonal high water table, silver sagebrush *(Artemisia cana)* can be found with sedges *(Carex spp.)*, bluegrass, lupine, clovers *(Trifolium spp.),* wild iris *(Iris spp.)* and other associated species.

Scattered among the sagebrush are stands of curlleaf mountain *mahogany (Cercocarpus ledifolius)* found on the dry rocky sites.

Woodlands found in the PMU include pinyon *(Pinus monophylla)* and Utah juniper *(Juniperus osteosperma)* woodlands at the lower elevations up to 8000 feet. The pinyon/juniper exceeds its historical distribution and density in the Sweetwater Area. This especially is the case at the lower and mid elevation where the woodlands continue to encroach into the sagebrush communities. This expansion and an increase in the stand density has resulted in a reduction of the understory component. Erosion rate has been accelerated due to lack of understory. Fire frequency may also be less than reference conditions due to a reduction of the fine fuel that once carried the fires.

Jeffrey pine *(Pinus jeffreyi),* lodgepole *(P. contorta)*, white fir *(Abies concolor)*, red fir *(A. magnifica)*, western juniper *(J. occidentalis)* woodland are found as elevation increases.

In the subalpine zone whitebark pine *(P. albicaulis)*, lodgepole pine *(P. contorta)*, western white pine *(P. monticola)*, limber pine *(P. flexilis)* and mountain hemlock *(Tsuga mertensiana)* are the primary tree species.

Interspersed are lakes, streams, wet meadow and dry meadows, springs and seeps. Vegetation associated with these areas includes stands of aspen (*Populus tremuloides*), willows *(Salix ssp.)* and cottonwoods *(Populus ssp.)* There are several old wheatgrass seedings found on Sweetwater summit and Wheeler flat. Other vegetation types include cultivated crops (alfalfa hay), and irrigated pastures and hay fields.

4.2 Sage-grouse Habitat Description and Condition Assessment

Sagebrush vegetation types include Lahontan sagebrush, Wyoming big sagebrush, low sagebrush, and mountain big sagebrush. Associated vegetation types include salt desert shrub, pinyon-juniper woodland, aspen, lodgepole, Mountain mahogany, native meadows, irrigated forage and crested wheatgrass seedings.

4.2.1 Breeding Habitat

There are 13 confirmed leks of which ten are active within the Desert Creek - Fales PMU. The *Desert Creek lek* is located at the south end of Smith Valley, Nevada, at an elevation of 5,200 feet. The habitat in the surrounding area is a mixture of Lahontan sagebrush and Wyoming sagebrush with encroaching pinyon woodlands. Habitat has been assessed as R0, R2 and R3.

The Sweetwater lek and surrounding area is located near Sweetwater summit at an elevation of 6800 feet on the east side of the Sweetwater Mountains. The habitat is a mixture of mountain big sagebrush and low sagebrush with encroaching pinyon/juniper trees. Portions of the area are old crested wheatgrass seedings. Habitat has been assessed as R0, R2, R3 and R0agcr.

A total of six strutting grounds have been identified in the *Fales lek* complex. These 6 strutting areas are located at 7,000 feet elevation on Burcham and Wheeler Flats in the vicinity of Sonora Junction (junction of highways 395 and 108) in northern Mono County. The habitat is a mixture mountain big sagebrush/bitterbrush with some low sage, sub-alpine sagebrush/snowberry and silver sage. There is an old crested wheatgrass seeding on Wheeler Flat. Sagebrush habitats have been assessed as R0, R2 and R0agcr. Of the 6 leks identified in the Fales area, only two (leks 2 and 3) are considered to be dependable, long term leks based on male attendance. Lek 1, which was initially counted in 1953, became inactive in 1981 and has not been surveyed since 1991. Leks 2a, 3a and 4 appear to represent satellite grounds based their intermittent use.

The Jackass lek, which was first discovered in spring 2003, is located on Jackass Flat on the northeastern flank of the Sweetwater Mountains at an elevation of approximately 8,000 feet (3,200 m). The habitat on Jackass Flat is a mosaic of mountain big sagebrush and low sagebrush with some sub-alpine sagebrush/snowberry. Habitat has been assessed as R0, R2, R3 and R1 (recent burn).

Table 4-3 lists the leks identified within the PMU and their status.

Table 4-3. Activity status of known leks in the Desert Creek – Fales PMU.

LEK NAME	STATUS**
Desert Creek 1	ACTIVE
Desert Creek 2	ACTIVE
Desert Creek 3	ACTIVE
Sweetwater 1	ACTIVE
Sweetwater 2	ACTIVE
Wiley Ditch 1	ACTIVE
Wiley Ditch 2	ACTIVE
Wiley Ditch 3	ACTIVE
Wiley Ditch 4	ACTIVE
Fales 1	INACTIVE (birds last observed in 1980)
Fales 2 (Burcham Flat)	ACTIVE
Fales 2a (Burcham Flat)	SATELLITE-INTERMITTENT USE
Fales 3 (Wheeler)	ACTIVE
Fales 3a (Wheeler Flat)	SATELLITE-INTERMITTENT USE
Fales 4	SATELLITE-INTERMITTENT USE
Jackass 1	ACTIVE
”ACTIVE” leks are those where male birds have been observed during the strutting season within the last 5 years.	

4.2.2 Summer/ Late Brood Habitat

Private lands within the Desert Creek – Fales PMU are very important for summer brood habitat. The core of the summer brood habitat associated with the *Desert Creek leks* is the meadows on the Desert Creek Ranch and adjacent National Forest lands. Summer brood habitat associated with the *Sweetwater leks* includes the meadows on the Sweetwater

Ranch and adjacent ranches, and National Forest lands. Additional summer habitat has been documented on the west side of the Sweetwater range. The summer brood habitat associated with the *Fales leks* includes the meadows on Wheeler Flat and potentially some of the meadows in the Sweetwater Mountains.

4.2.3 Winter Habitat

Winter habitat in the vicinity of the *Desert Creek Leks* is the surrounding area and the Pine Grove Hills to the east. Winter habitat in the vicinity of the *Sweetwater* leks is the surrounding area and to east on the East Walker River. Winter habitat associated with the *Fales* lek has not been confirmed, but could potentially occur in the vicinity of Antelope Valley.

4.3 Sage-grouse Population

4.3.1 Historical Distribution

4.3.2 Current Distribution

Desert Creek / Sweetwater, Nevada – In 2002 the size of the Nevada population of the Desert Creek/Sweetwater population of the Desert Creek/Fales PMU stood somewhere between the low estimate of 471 birds and a high estimate of 565 birds. This estimate was produced using a population estimator created by the technical committee of the Western States Sage-grouse Team. A three-year average was used to produce this estimate. Observations from the years of 2000, 2001 and 2002 were used. An updated estimate following the 2003 census gives a low estimate of 672 and a high estimate of 807.

Trend. This population of sage-grouse has maintained relative stability over the past 50-year period. Annual observations of this population began in 1953 and continued to the present. There were some years when surveys were not conducted for a variety of reasons. However, the efforts remained fairly consistent over the years.

The highest number of observed strutting males occurred at the onset of population monitoring in 1953 when 153 strutting males were recorded. The number of strutting males remained high until 1960 when a decrease in activity was noted. The average for the 1960s was 46 strutting males. The next two decades saw an increase where ten-year-averages of 57 and 68 were recorded. The 1990s showed a decrease to a ten-year-average of 51 males observed. The average number of active males strutting has risen to 63 since 2000. The average number of strutting males observed over the 50-year period since 1953 is 65 active males. The current trend indicates an increase in activity for this population of sage-grouse.

Summer brood counts have shown the same general trend that is recorded for strutting activity. The data are showing a general seven to ten-year cycle with rises and declines in production. Climate certainly has an impact on production for this population. However the population appears to be maintaining stability at this time.

Fales Population. Annually, the Department of Fish and Game, Bureau of Land Management and other resource agencies assess the status of sage-grouse breeding populations in Mono County, California, by surveying all known leks for activity, searching for new leks, and obtaining peak counts of the number of males attending each know lek.

To date, a total of 6 strutting locations, including core leks and associated satellite leks, have been identified in the Fales breeding complex (See Section_____ for a complete description of breeding habitat). These 6 strutting areas are located on Burcham and Wheeler Flats in the vicinity of Sonora Junction (junction of highways 395 and 108) in northern Mono County. Of the 6 leks identified to date, only two (leks 2 and 3) are considered to be dependable, long term leks based on male attendance. Lek 1, which was initially counted in 1953, became inactive in 1981 and has not been surveyed since 1991. Leks 2a, 3a and 4 appear to represent satellite grounds based on their intermittent use.

Beginning in 1987, the method for conducting lek counts was standardized in attempt to obtain the annual peak high male count for all known active leks in the Fales population. Annual monitoring efforts prior to 1987 did not always involve multiple lek counts because of problems associated with personnel and weather constraints. The method used to establish the peak single day count typically involved 1 experienced person counting at each lek on at least 3 separate days conducted during the period when female and male presence was at a maximum (Connelly et al. 2003). The peak single day count was taken on the day with the highest cumulative number of males counted on all leks visited within the breeding complex. Leks were monitored for activity from early March to judge the likely period of peak lek occupation.

Population Estimates.
Two population expansion estimators, Emmons and Braun (1984) and Walsh (2002), were used to estimate the upper and lower limits of the most recent spring sage-grouse population in the Fales breeding complex. The low estimate (Emmons and Braun 1984) assumes that there are 2.00 hens per male, while the number of undetected males (adult males not attending leks and immature males) is 25% that of visible males. The high estimate (Walsh 2002) assumes that only 50% of all males attend leks and that there are 2.73 hens per male. The assumption that 10% of all leks in the PMU are still undetected was applied to both estimators. Based upon the average of peak lek counts conducted in the Fales breeding complex from 2000-2002, the most recent spring population estimate for the California segment of the Bodie Hills PMU was between 122 and 182 grouse

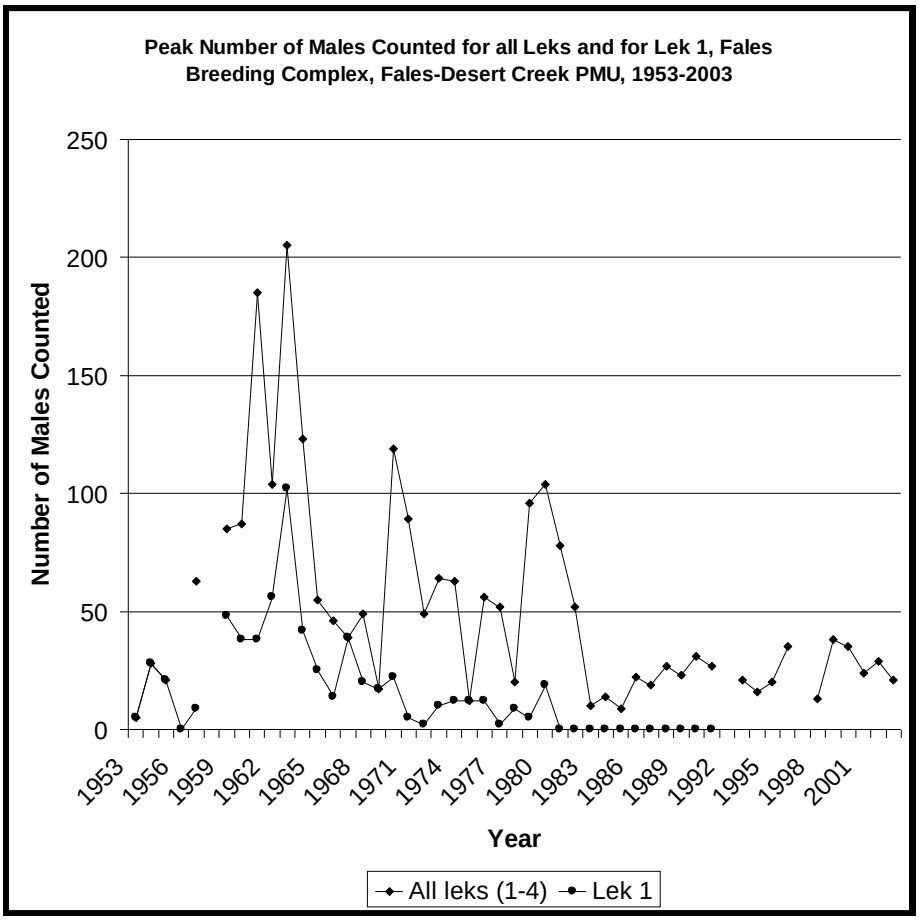
Trend. Initial population monitoring efforts in the Fales area began in 1953 with the counting of lek 1. Leks 2 and 3 were added to the survey in 1957, and lek 4 in 1961. From 1957-1980, the average number of males counted on all leks and was 78. The high peak count during this same period was 205 males in 1963 (Figure 4-1). Of these 205 males, nearly 50% were counted on lek 1, located within 50 m west of Highway 395 (Figure _____.1). Annual male attendance on lek 1 averaged 36 birds from 1957-1970; however, from 1971-1980, that use declined to an average of just 9 males. By 1981, grouse use of lek 1 had ceased entirely and no birds have been observed on this lek since that time. It was the loss of lek 1 that apparently served as the catalyst for a precipitous decline in the Fales sage-grouse population (Figure ____.1). From 1982-2003, the average number of males counted with the entire Fales breeding complex was 27 birds (Figure ____.1). The high peak count during this same period was just 38 males in 1999 (Figure ____.1).

The trend in the Fales sage-grouse populations is marked by two distinct periods (Figure ____.2). From 1957-1981, 3-year moving averages for the number of males counted fluctuated between 75% and 311% of the long-term average In some years lek surveys were not conduced or abnormally low sample sizes were obtained due to low sampling effort (e.g., one-time counts), which may account for the wide fluctuation in 3-year average lek counts. For the most part, however, average lek counts remained well above or just slightly

below the LTA for the period. The Fales grouse population attained its highest level from 1959-1964, when 3-year averages ranged from 140% to 311% of the LTA (Figure 4-2).

Beginning in 1982, the Fales population began a steep, downward trend which was apparently linked to the cessation of breeding activity on lek 1 (Figure 4-2). Three year moving averages from 1982-1991 dropped from 88% of the LTA in 1982 to as low as 20-30% of the LTA from 1984-1986. From 1993-2003, three year moving averages ranged from 26-56% of the LTA. The most recent three-year average (2000-2002) indicates that the Fales sage-grouse population is maintaining a low, but stable trend at around 50% of the LTA (Figure 4-2).

Figure 4-1. Peak number of males counted for all leks and for Lek 1 from the Fales Breeding Complex in the Desert Creek – Fales PMU/



Jackass Flat Population

In spring 2003, a new sage-grouse strutting ground was located in extreme northeast Mono County, California, in the vicinity of Jackass Flat. Jackass Flat is located on the northeastern flank of the Sweetwater Mountains at an elevation of approximately 8,000 feet (3,200 m). The Jackasss Flat lek is located approximatley 11 air-miles (7 km) north of Burcham Flat, which supports the northern most lek within the Fales breeding complex. The peak high count for the Jackass Flat lek in 2003 was 10 male grouse.

4.4 Desert Creek - Fales PMU Risk Assessment and Conservation Actions

Existing and foreseeable risks for the Desert Creek - Fales PMU include pinyon juniper encroachment, conversion of rangeland to agriculture, urbanization, power lines and other infrastructure, human disturbance, predation, hunting, and livestock grazing. Each is discussed in detail below. The priority for concern for the PMU is:

1. Pinyon-juniper encroachment
2. Urbanization / Land Use
3. Human Disturbance
4. Sagebrush habitat condition
5. Power lines, roads, fences, other infrastructure
6. Livestock grazing
7. Predation
8. Hunting

4.4.1 Pinyon-Juniper Encroachment

Pinyon-juniper encroachment is occurring throughout the entire Desert Creek-Fales PMU in both upland and riparian habitats and is adversely affecting both habitat quality and quantity for sage-grouse. The replacement of sagebrush range sites with pinyon juniper woodlands is fragmenting the sagebrush habitats and diminishing habitat connectivity. Pinyon-juniper also provides additional nesting and perching habitat for predatory birds such as ravens that prey on sage-grouse chicks, particularly during the early brood stage.

The risks from pinyon-juniper encroachment are manageable and predictable, but expensive to mitigate. Christmas tree and fire wood cutting and tree mortality from insects and disease, especially during drought years are reducing tree density, but on a very small scale in comparison to the extent of the pinyon-juniper encroachment.

Additional Data Needs to Verify and Further Characterize the Risk:

- Inventories to document sagebrush, riparian and woodland sites needs to be completed throughout the PMU for both USFS and private lands.
  Who: USFS, Private, NRCS
  When: ongoing on National Forest

- Identify critical habitat areas with pinyon-juniper encroachment for potential treatment.
  Who: USFS, Private, NRCS, NDF, NDOW, CFG
  When: on going

- Monitoring bird movements with radio telemetry is needed to verify population distribution patterns in relation to habitat connectivity.
  Who: NDOW, CFG, USGS
  When: ongoing

Initial Conservation Strategy:

Establish a demonstration project at Dead Ox Spring to determine the effects of PJ removal on the site. This site is currently characterized by a closed canopy of pinyon-juniper.

Remove pinyon-juniper where it is invading known, sage grouse habitat using the appropriate treatment technique.

Photo 4.1 Proposed treatment area Number 1. Near Sweetwater Summit. Note density of pinyon in foreground and pinyon encroachment in the background to the right.

<u>Conservation Action: Pinyon Juniper Reduction</u>

<u>Risk</u>: Loss of sagebrush habitat in the Sweetwater breeding area complexes due to encroachment of pinyon-juniper.

<u>Objective</u>: Remove pinyon-juniper over story where it is encroaching into sagebrush habitat adjacent to the breeding area complexes. Treat approximately 3,380 acres.

Action: Remove pinyon-juniper over story with most appropriate technique. (Cutting, burning, chaining, herbicide.)

Rationale: Habitat in the Sweetwater Complex is a mixture of mountain big sagebrush, low sagebrush, and old crested wheatgrass seeding, with encroaching pinyon-juniper trees. Habitat has been assessed as R0, R2, R3 and R0agcr (sagebrush with crested wheatgrass). Those areas within 2 miles of the lek, that are classified as Phase I (few to many small trees not affecting understory, < 11% canopy cover) and Phase II (12-54% canopy cover, rapid tree growth, declining understory) were selected for removal of pinyon over story. Treating Phase I and Phase II is more effective than treating Phase III (tree dominance, little understory > 55% canopy cover). Treatment of Phase I will maintain existing habitat and treatment of Phase II will increase the amount of habitat in the Sweetwater complex.

Legal Authority: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest.

Procedural Requirements: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest.

Level of Partnership Commitment:

Funding Source: National Forest appropriated dollars requested for FY 2004 and in planning process for 2005; partnerships to be pursued for full implementation.

Implementation Process:

1. Project Planning: Forest Service (2004):
    a. Identify action locations.
    b. Enter into budget planning.
    c. Identify Proposed Action for treatment
    d. Schedule Heritage and Biological surveys
    e. Complete Environmental Analysis.
2. Project Implementation Forest Service/Partners (2005):
    a. Budget for project
    b. Budget for Partners
3. Project Monitoring: Forest Service/NDOW/ Partners (2005-2006):
    a. Forest Service monitor implementation for consistency with the proposed action. Monitor change in percent canopy cover of pinyon-juniper before treatment and one year after treatment. Complete additional treatment required to accomplish the project proposal.
    b. Nevada Department of Wildlife continue monitoring sage-grouse populations through lek counts for changes in numbers of males visiting leks.
    c. Report accomplishment to USFWS, Reno Office.

Project Area Locations:

1. Project Site One: Sweetwater Complex; One mile west of Wiley Ditch #2 lek (T8N, R25E, E ½ Sec 15, W ½ 14).
   Description:

a. Elevation 7,000-7,200 feet
b. Aspect: East
c. Dominant Vegetation: Mixed brush community with mountain big sagebrush, Wyoming Big sagebrush, desert peach, bitterbrush.
d. Pinyon Phase: Phase I – few too many young/submature trees present, but not affecting understory. Phase II.
e. Acres: 960
f. Soil Type: Soil Map Unit 851 and 861
g. Other Existing Uses:
   - Grazing: Desert Peak S&G and Sweetwater C&H
   - Pine Nut collecting in adjacent mature stands of pinyon
   - Deer summer/transitory range

2. Project Site Two: Between Wiley Ditch and Wiley Ditch #2 (T.8N, R25E, NWSW, Sec. 18, T8N, R24E, NESE, Sec. 12)
   Description:
   a. Elevation 6600 feet
   b. Aspect: East
   c. Dominant Vegetation: Mixed brush community with mountain big sagebrush, Wyoming Big sagebrush, desert peach, bitterbrush.
   d. Pinyon Phase: Phase I and II.
   e. Acres: 160
   f. Soil Type: Soil Map Unit 851
   g. Other Existing Uses:
      - Grazing: Desert Peak S&G and Sweetwater C&H
      - Deer summer/transitory range

3. Project Site Three: Sweetwater Complex; East of Wiley Ditch #1 (T8N, R25E, Sec 17, East ½ of the West ½).
   a. Elevation: 6,600
   b. Aspect: Southwest
   c. Vegetation: Pinyon Phase I and II: Understory is intermix of big sagebrush, bitterbrush and low sagebrush.
   d. Acres: 100
   e. Soil Type: Soil Map Unit 851
   f. Other Existing Uses:
      - Grazing: Nye Canyon C&H

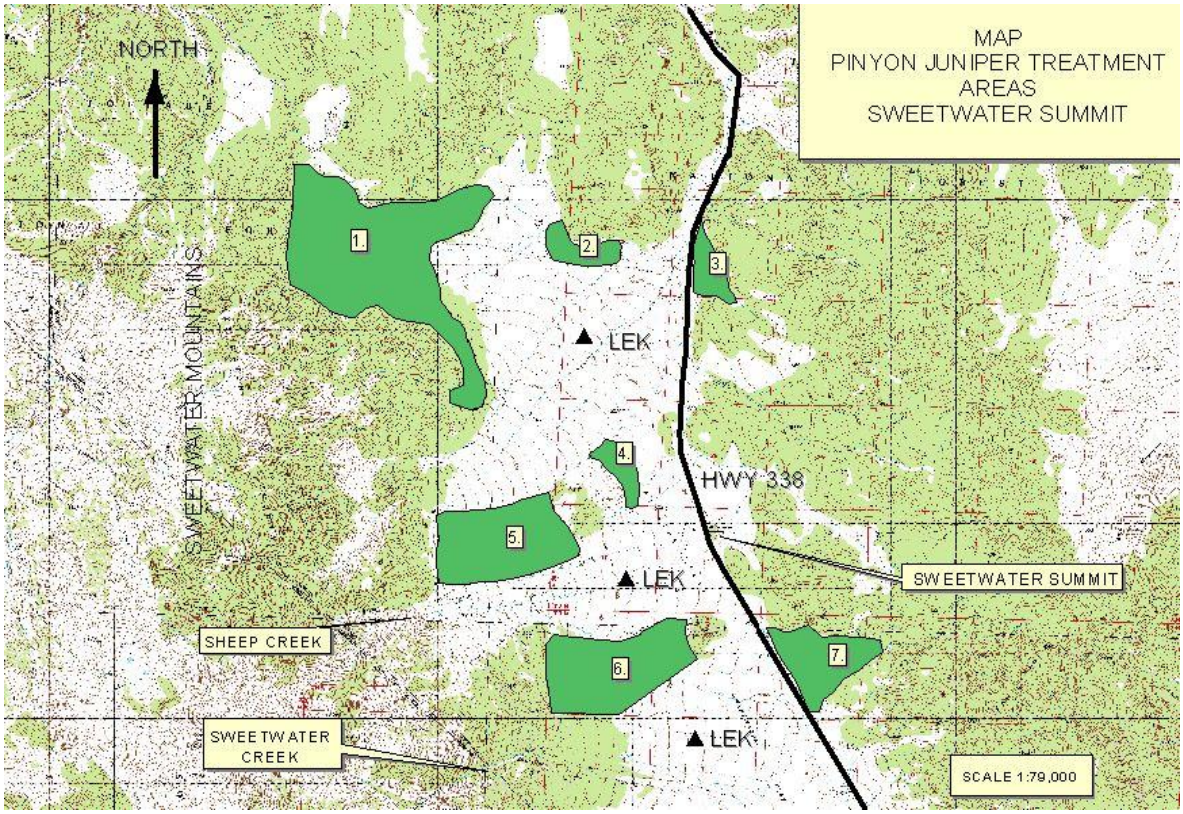
4. Project Site Four: Sweetwater Complex; South of Wiley Ditch #3 and north of Sweetwater #1 (T8N, R25E, Sec 30, NWSE)
   a. Elevation: 6900
   b. Aspect: Northeast
   c. Vegetation: Big sagebrush
   d. Pinyon Phase: Phase I –few too many young/submature trees present, but not affecting understory.
   e. Acres: 200
   f. Soil Type: Soil Map Unit 861
   g. Other Existing Uses:
      - Grazing: Sweetwater C&H

5. Project Site Five: 1 mile West to Northwest of Sweetwater #1 (T8N, R24E, Sec. 35, 36).
    a. Elevation 7200-8400 feet
    b. Aspect: Northeast
    c. Dominant Vegetation: Mixed brush community with mountain big sagebrush, Wyoming Big sagebrush, desert peach, bitterbrush.
    d. Pinyon Phase: Phase I, II.
    e. Acres: 1000
    f. Soil Type: Soil Map Unit 923, 851
    g. Other Existing Uses:
        - Grazing: Desert Peak S&G and Sweetwater C&H
        - Pine Nut collecting in adjacent mature stands of pinyon
        - Deer summer/transitory range

6. Project Site Six: 1/2 mile west of Sweetwater #2 (T7N, R25E, Sec 6 West ½)
    a. Elevation: 7,000 - 7,200
    b. Aspect: East
    c. Vegetation: Pinyon Phase I., II., III: Understory is mountain big sage and bitterbrush
    d. Acres: 640
    e. Soil Type: Soil Map unit # 851, 861
    f. Other Existing Uses:
        - Grazing: Sweetwater C&H

7. Project Site Seven: One and a half mile east of Sweetwater #2 (T7, R26E, Sec 4, SE ¼) Long Doctor Spring
    a. Elevation: 6,500
    b. Aspect: southwest
    c. Vegetation: Pinyon Phase I., II: Understory is low sagebrush with Wyoming and Mountain big sagebrush.
    d. Acres: 320
    e. Soil Type: Soil Map Unit 861
    f. Other Existing Uses:
        - Grazing: Bald Mountain S&G and East Walker Stock drive
        - Wildlife: Mule Deer winter and transitory range.
        - Mining: Isolated claims with low potential for activity

Figure 4-2. Location of proposed pinyon-juniper treatment areas in the Desert Creek PMU.



Conservation Action: Riparian Habitat Improvement

Risk: Loss of late summer brooding habitat from encroaching pinyon pines on riparian areas in the Desert Creek/Fales PMU.

Objective: Remove encroaching pinyon trees from riparian habitat that supported wet to dry meadow vegetation

Action: Remove pinyon overstory with most appropriate technique (cutting, burning, chaining, herbicide, etc.)

Rationale: Late summer brooding habitat is being replaced by encroaching pinyon-juniper in portions of the Desert Creek/Fales PMU. Late summer habitat consists of wet and dry meadows, springs, seeps and streams. These riparian areas are important sources of insects and forbs when the surrounding upland habitat dries up in the late summer. Numerous riparian areas at the mid-elevation of the Sweetwater and Pine Grove Mountains have been or are going to be lost due to increasing density of trees. Locations are on National Forest land private lands.

Legal Authority: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest or private land owners

Procedural Requirements: National Environmental Policy Act requirements are identified in the project description below for National Forest Lands.

Level of Partnership Commitment:

Funding Source: National Forest appropriated dollars requested for FY 200__ and in planning process for 200___; partnerships to be pursued for full implementation. Cost share grants are available for private land from various sources.

Implementation Process:

1. Project Planning: Forest Service (200__):
    a. Identify action locations.
    b. Enter into budget planning.
    c. Identify Proposed Action for treatment
    d. Schedule Heritage and Biological surveys
    e. Complete Environmental Analysis.
2. Project Implementation Forest Service/Partners (200__):
    a. Budget for project
    b. Budget for Partners
3. Project Monitoring: Forest Service/NDOW/ Partners (200__-200__):
    a. Forest Service monitors implementation for consistency with the proposed action. Monitor change in percent canopy cover of pinyon before treatment and one year after treatment. Complete additional treatment required to accomplish the project proposal.
    b. Nevada Department of Wildlife continues monitoring sage-grouse populations through lek counts for changes in numbers of males visiting leks.
    c. Report accomplishment to USFWS, Reno Office.

4. Project Planning**:** NDF, Private Land Partners (200__):
    a. Identify action locations.
    b. Enter into budget planning.
    c. Identify Proposed Action for treatment
    d. Schedule Heritage and Biological surveys
    e. Complete Environmental Analysis.

5. Project Implementation NDF/Partners (200__):
    a. Budget for project
    b. Budget for Partners

6. Project Monitoring: NDF/NDOW/ Partners (200__-200__):
    a. Monitor implementation for consistency with the proposed action. Monitor change in percent canopy cover of pinyon before treatment and one year after treatment. Complete additional treatment required to accomplish the project proposal.
    b. Nevada Department of Wildlife continues monitoring sage-grouse populations through lek counts for changes in numbers of males visiting leks.
    c. Report accomplishment to USFWS, Reno Office.

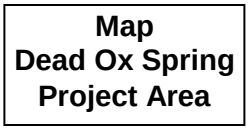
Project Plans:

1. Project Site One: Dead Ox Spring (T9N, R25, Sec. 25)

Joint Volunteer Project with Bi-State Planning Team and USFS
Description:

a. Land Ownership: USFS
b. Elevation 7800 feet
c. Aspect: South
d. Dominant Vegetation: Pinyon Pine
e. Acres: 20?
f. Soil Type
g. Other Existing Uses:
    - Grazing:
    - Pine Nut collecting in adjacent mature stands of pinyon
    - Deer summer/transitory range

Figure 4.2 Location of Dead Ox Spring project area



2. Project Site Two: Long Doctor Spring (T7N ,R.26E, Sec. 4)
    a. Land Ownership: USFS
    b. Elevation 6600 feet
    c. Aspect: East
    d. Dominant Vegetation: Mixed brush community with mountain big sagebrush, Wyoming Big sagebrush, desert peach, bitterbrush.
    e. Pinyon Phase: Phase I and II.
    f. Acres: 20
    g. Soil Type: Soil Map Unit
    h. Other Existing Uses:
        - Grazing
        - Deer summer/transitory range

3. Project Site Three: Upper portion of Dalzell Canyon (T.8 N. R25E, Sec.8, 17, 18.)
    a. Land Ownership: Private/USFS
    b. Elevation: 6700
    c. Aspect: NE
    d. Vegetation: Pinyon Phase I and II: under story meadow, creek
    e. Acres: 100
    f. Soil Type: Soil Map Unit
    g. Other Existing Uses:
        - Grazing

4. Project Site Four: Portions of Fryingpan Creek (T7N, R25E, 32, 33, and 34)
    a. Land Ownership: Private/USFS
    b. Elevation: 6200- 6700
    c. Aspect: E

d. Vegetation: Pinyon Phase I and II: under story meadow, creek
e. Acres: 100
f. Soil Type: Soil Map Unit
g. Other Existing Uses:
   - Grazing

5. Project Site Five: Misc. other springs, seep, meadows as identified at a later date.
   a. Land Ownership: Private/USFS

4.4.2 Urbanization/Land Use

Private rangeland in Desert Creek, Fales/Burcham Flat, Sweetwater, and the east side of Antelope Valley are being converted to residential and vacation homes. Residential development may reduce habitat resulting in risks to habitat quantity and fragmentation. Human activities including ORV, private airstrips, horse riding, biking, walking, etc. may disturb individual birds during the breeding and nesting seasons. Domestic dogs and cats can prey on sage-grouse. This risk is manageable and predictable and can range from inexpensive to expensive to mitigate.
See Map ____ for private lands in PMU.

Additional Data Needs to Verify and Further Characterize the Risk:

- An inventory of land ownership and vegetation types is needed to evaluate the extent of potential losses of habitat from this activity.

- An inventory of habitat types on private lands and existing use by sage-grouse is needed to characterize habitat distribution in the PMU.

Conservation Action: Maintain Or Improve Habitat Quality And Quantity On Private Lands

Risk: Private lands in the Wheeler Flat and Burcham Flat areas in California and the Desert Creek, Sweetwater, and Antelope Valley areas in California and Nevada are under current or future threat of development.

Objective: Maintain or improve habitat quality and quantity on private lands in the Wheeler Flat and Burcham Flat area in California and the Desert Creek, Sweetwater and Antelope Valley areas in California and Nevada.

Action: Provide information, education and funding to maintain and improve existing sage-grouse habitat on private lands.

Rationale: Residential development may reduce habitat resulting in risks to habitat quantity and fragmentation.

Legal Authority: Projects addressing this risk are within the management responsibility of California Fish and Game and Nevada Department of Wildlife, Mono, Douglas and Lyon County government.

Procedural Requirements: Dependent on program.

Level of Partnership Commitment: High

Funding Source**:** Various private, State and Federal programs.

Implementation Process:

1. Identify existing land ownership
    a. Who - NDOW, CFG
    b. When – 2004

2. Develop a map of private lands areas with critical habitat concerns
    a. Who - NDOW,CFG
    b. When – 2004

3. Establish partnerships with private landowners and determine their interest in sage-grouse conservation. Provide habitat assessment on private land to identify management opportunities for sage-grouse..
    a. Who - Bi-State planning group, NDOW, CFG, NRCS
    b. When – 2004-05

4. Provide information/partnerships on funding programs for habitat management and improvement of private land. Conduct workshops for private landowners on management techniques that can be used to maintain or enhance sagebrush habitats.
    a. Who - Bi-State, NDOW, CFG, partners
    b. When - 2004

5. Develop and implement habitat management projects on private lands.
    a. Who – NDOW, CFG, NRCS
    b. When – 2005-06
    c. Identify project locations
    d. Identify proposed projects
    e. Identify funding sources
    f. Acquire funding
    g. Implement projects/actions

6. Support zoning that will maintain, enhance or preserve critical sage-grouse habitat
    a. Who - NDOW, CFG, partners
    b. When – When local planning is initiated

7. Identify, propose and initiate: conservation easement- short term and long term, land exchange or land acquisition for private lands that are under current or future threat of development.
    a. Who – NDOW, CFG, NRCS, private land owners
    b. When – 2005-06
    c. Identify project locations
    d. Identify proposed projects
    e. Identify funding sources
    f. Acquire funding
    g. Implement projects/actions

8. Project Monitoring. Monitor sage-grouse populations. Report accomplishment to USFWS, Reno Office.
    a. Who – NDOW, CFG, Partners
    b. When – 2006

4.4.3 Conversion of Rangeland to Agriculture

Land conversion from rangeland to agriculture risks sage-grouse habitat quality, quantity, and sage-grouse populations. Winter habitat on private sagebrush rangelands in specific sites including Sweetwater, Desert Creek, Dalzel Canyon, and state line at the Walker River is being converted to irrigated pasture and hay fields. Irrigated pasture has been known to provide late summer habitat for sage-grouse, but it may be at the loss of needed winter habitat. Agriculture uses may benefit sage-grouse if certain habitat characteristics are provided for. The risk to sage-grouse from habitat conversion is manageable and predictable, but expensive.

Additional Data Needs to Verify and Further Characterize the Risk:

- An inventory of land ownership and vegetation types is needed to evaluate the extent of potential losses of winter habitat from this activity.

- An inventory of habitat types on private lands and existing use by sage-grouse is needed to characterize habitat distribution in the PMU.

Conservation Action: Maintain Or Improve Habitat Quality And Quantity On Farm And Ranch Lands

Risk: Private lands in the Desert Creek, Sweetwater and Antelope Valley areas in California and Nevada are under current or future threat of conversion to agriculture.

Objective: Maintain existing habitat on private lands and provide opportunity to improve habitat on private lands.

Action: Provide information, education and funding to maintain and improve existing sage-grouse habitat on private lands.

Rationale: Private rangeland conversion to agriculture risks sage-grouse habitat quality, quantity and populations.

Legal Authority: Projects addressing this risk are within the management responsibility of California Fish and Game and Nevada Department of Wildlife, Mono, Douglas and Lyon County government.

Procedural Requirements: Dependent on program.

Level of Partnership Commitment: High

Funding Source: Various private, State and Federal programs.

Implementation Process:

1. Identify existing land ownership

a. Who - NDOW, CFG
b. When – 2004

2. Develop a map of private lands areas with critical habitat concerns
    a. Who - NDOW, CFG
    b. When – 2004

3. Establish partnerships with private landowners and determine their interest in sage-grouse conservation. Provide habitat assessment on private land to identify management opportunities for sage-grouse
    a. Who - Bi-State planning group, NDOW, CFG, NRCS
    b. When – 2004-05

4. Provide information/partnerships on funding programs for habitat management and improvement of private land
    a. Who - Bi-State, NDOW, CFG, partners
    b. When – 2004

5. Develop and implement habitat management projects on private lands.
    a. Who – NDOW, CFG, NRCS
    b. When – 2005-06
    c. Identify project locations
    d. Identify proposed projects
    e. Identify funding sources
    f. Acquire funding
    g. Implement projects/actions

6. Support zoning that will maintain, enhance or preserve critical sage-grouse habitat
    a. Who - NDOW, CFG, partners
    b. When – When local planning is initiated. Note: Smith Valley in process of developing a Master Plan for 2005.

7. For those private lands that are under current or future threat of conversion to agriculture, identify, propose and initiate conservation easement, short term and long term; land exchange or land acquisition
    a. Who – NDOW, CFG, NRCS, private land owners, partners
    b. When – 2005-06
    a. Identify project locations
    b. Identify proposed projects
    c. Identify funding sources
    d. Acquire funding
    e. Implement projects/actions

8. Project Monitoring. Monitor sage-grouse populations. Report accomplishment to USFWS, Reno Office.
    a. Who – NDOW, CFG, Partners
    b. When – 2006

4.4.4 Human Disturbance

Risks to sage-grouse populations in the Desert Creek - Fales PMU from human disturbance are affecting multiple birds on multiple sites year round, but especially during the breeding and nesting seasons. Some critical sage-grouse habitats in the Desert Creek - Fales PMU are accessible for public recreation year round or are adjacent to recently developed housing areas. Lek activity has been published by NDOW, and lek locations are easily accessed and well known. Mitigating these kinds of risks from human disturbance is manageable but expensive.

Additional Data Needs to Verify and Further Characterize the Risk:

- Identify seasonal use areas by sage-grouse in the Desert Creek – Fales PMU by radio telemetry to correlate with existing land use activity.

Initial Conservation Strategy:

- Limit public access to lek sites during the breeding and nesting season to avoid disturbance by humans.

- Establish a wildlife viewing point for the Desert Creek lek for the public at safe distances from the leks and develop educational programs and materials to inform people about the problems caused by human disturbance, i.e. driving to the lek during breeding season.

- Limit the disturbance in critical winter habitats.

Conservation Action: Limited Public Access

Risk: Disturbance of the birds during the breeding and nesting season may be reducing reproduction success.

Objectives:

1. Limit public access to lek sites during the breeding and nesting season to avoid disturbance by humans.
2. Establish wildlife viewing points for the public at safe distances from the leks and develop educational programs and materials to inform people about the problems caused by human disturbance.
3. Limit the disturbance in critical winter habitats.

Actions:

1. Close public access to the Desert Creek lek sites during breeding and nesting season.
2. Establish a wildlife viewing area for the Desert Creek Lek with educational information.
3. Identify winter use areas of sage-grouse to determine if there is a conflict with winter recreational uses.

Rationale: By reducing possible disturbance to the birds during breeding and nesting season, reproductive success may improve.

Legal Authority: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest. Highway Kiosk USFS, NDOT and Lyon County. Monitoring sage-grouse and recreational activities would include NDOW, CFG and USFS.

Procedural Requirements: NEPA.

Level of Partnership Commitment:

Funding Source: National Forest appropriated dollars requested for FY 200__ and in planning process for 200__; partnerships to be pursued for full implementation.

Implementation Process:

1. Project Planning: Forest Service (200__):
    a. Identify action locations.
    b. Enter into budget planning.
    c. Complete Environmental Analysis.
2. Project Implementation Forest Service/Partners (200__):
    a. Budget for project
    b. Budget for Partners
3. Project Monitoring: Forest Service/NDOW/ Partners (2005-2006):
    a. Forest Service monitors implementation for consistency with the proposed action.
    b. NDOW and CFG continues monitoring sage-grouse populations through lek counts for changes in numbers of males visiting leks.
    c. Report accomplishment to USFWS, Reno Office.

Project Area Locations

1. Project Site One: Desert Creek Lek Closure – March 1 to May 30.
    a. Acres: 1280 acres
    b. Other Existing Uses:
        - Grazing: Cattle, winter use
        - Deer summer/transitory range

2. Project Site Two: Desert Creek Kiosk and Viewing Area
   Location: Along Hwy 338 across from Lek areas.

Figure 4-4. Proposed location of Desert Creek Lek Closure and Kiosk.

Map
Desert Creek
Closed Area
And
Kiosk

4.4.5 Overall Sagebrush Habitat Condition

The ecological condition of sagebrush habitats within the Desert Creek – Fales PMU is variable across the landscape resulting in potential and current risks to habitat quality for sage-grouse. Sagebrush is old and decadent in some areas with little desirable understory. Mountain sagebrush cover is dense in areas such as Burcham and Wheeler Flat. Sagebrush sites such as the area surrounding the Desert Creek nesting area and some early brooding areas lack forbs and associated insects for young broods. At the opposite extreme, old crested wheatgrass seedings on Sweetwater summit have a good diversity of species and the sagebrush is in high vigor. Other factors that affect the quality of sagebrush habitats include wildfire, drought, insects, and range improvement budgets for federal land management agencies.

Additional Data Needs to Verify and Further Characterize the Risk:

- Quantify and map vegetation types to document the age and structural character of sagebrush in key areas.
- Review National Forest Management Guidelines for approved land management techniques.
- Monitoring data on condition and trend of key sagebrush habitats.

Initial Conservation Strategy:

Maintain or improve the health and vigor of existing sagebrush habitat in the PMU.

Conservation Action: Maintain/Improve Health/Vigor Of Existing Sagebrush Habitat

Risk: Reduction of quality and quantity of sagebrush habitat from natural decline and decadence.

Objectives:

1. Emphasize monitoring, analysis, and management of sagebrush range sites for sage-grouse on public lands.
2. Integrate specific objectives for sage-grouse habitat into land management plans.
3. Implement vegetation treatments appropriate to rejuvenate decadent sagebrush sites in the Desert Creek – Fales PMU.
4. Increase fire suppression priorities in critical sagebrush habitats, particularly areas prone to cheatgrass invasion.

Action: Inventory and assess sagebrush habitat for possible treatment to reduce the cover and density of mature and decadent sagebrush and to provide for the establishment of grasses, forbs and young sagebrush plants. Treatment: Brush beat, burn, herbicide, etc.

Rationale: Portions of the PMU contain sagebrush vegetation that is providing low quality habitat for sage-grouse.

Legal Authority: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest.

Procedural Requirements: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest.

Level of Partnership Commitment:

Funding Source: National Forest appropriated dollars requested for FY 200__ and in planning process for 200__; partnerships to be pursued for full implementation.

Implementation Process:

1. Project Planning: Forest Service (200__):
    a. Identify action locations.
    b. Enter into budget planning.
    c. Identify Proposed Action for treatment
    d. Schedule Heritage and Biological surveys
    e. Complete Environmental Analysis.
2. Project Implementation Forest Service/Partners (200__):
    a. Budget for project
    b. Budget for Partners
3. Project Monitoring: Forest Service/NDOW/ CFG/Partners (200__-200__):
    a. NDOW/CFG/ continue monitoring sage-grouse populations through lek counts and brood counts.
    b. Report accomplishment to USFWS, Reno Office.

Project Area Locations:

1. California Locations:
    a. Wheeler Flat
    b. Burcham Flat area
    c. Upper Desert creek

2. Nevada Locations:
    a. Sweetwater Summit
    b. The Elbow
    c. Bald Mountain

4.4.6 Power Lines, Roads, and Other Infrastructure

Power lines, roads, airstrips, and fences are risks to sage-grouse in the Desert Creek-Fales PMU that affect habitat quantity and populations on a yearlong basis. Breeding habitats, brood habitats, and migratory habitat can be impacted. Recent declines in the Fales population may be related to construction of power lines and associated land use activities over the last ten years. Power lines and roads may be effective barriers to bird movements. Sage-grouse have been known to fly into newly constructed fences.

New developments that pose this type risk are being managed on federal lands in conjunction with the National Environmental Policy Act (NEPA) process, and on private lands in California in accordance with the California Environmental Quality Act (CEQA).

Additional Data Needs to Verify and Further Characterize the Risk:

- Compile maps and specifications of transportation routes and corridors or road improvements proposed for construction in the Desert Creek – Fales PMU.
- Analyze the cumulative effects of existing transportation routes and corridors.

Initial Conservation Strategy:

- Use flagging to mark new fences, or relocate fence construction away from critical habitat areas.
- Maintain existing corridors for power lines and transportation routes. Locate new utility corridors away from leks.
- Modify aerial structures to prevent avian predator perching or nesting.
- Close and reclaim roads that ORV users have created into critical sage-grouse habitat areas.
- Limit development of new roads and trails to minimize impacts to critical habitat areas.

Conservation Action: Utility/Transportation Route Analysis

Risk: Predation, Accident Mortality, Loss of Habitat

Objectives: Reduce further impact to sage-grouse

Action: Compile maps and specifications of transportation routes and corridors or road improvements proposed for construction in the Desert Creek – Fales PMU. Analyze the cumulative effects of existing transportation routes and corridors. Locate new utility corridors away from leks.

Rationale: Will provide information on current and future impacts to sage-grouse.

Legal Authority: CFG, NDOW, USFS, NDOT, CalTrans

Conservation Action: Modify Aerial Structures

Action: Modify aerial structures to prevent avian predator perching or nesting.

Rationale: Aerial structures are know to provide perches for raptors and other avian predators.

Legal Authority: Utility Company.

Procedural Requirements

Level of Partnership Commitment:

Funding Source: Partners, Utility Company

Implementation Process:

Project Area Locations: Highway 395 from West Walker to Fales area

Conservation Action: Limit Off-Highway Routes

Action: Close and reclaim roads that ORV users have created into critical sage-grouse habitat areas. Limit development of new roads and trails to minimize impacts to critical habitat areas

Rationale: Roads may fragment habitat, support noxious weeds, disturb sage-grouse.

Legal Authority: USFS

Procedural Requirements

Level of Partnership Commitment:

Funding Source: USFS, partners

Implementation Process:

Project Area Locations:

4.4.7 Livestock Grazing

The risk to sage-grouse from livestock grazing is the reduction or removal on an annual basis of plant production that could either provide nesting/hiding cover or forage for sage-grouse. Grazing of meadows used for brooding by sage-grouse is not detrimental to the habitat when adequate cover and forbs are provided to meet sage-grouse needs. The potential for grazing to impact riparian meadow habitats by decreasing cover and forage for sage-grouse is more prevalent during the mid-late brooding period. Long term risk could be the change in composition of vegetation in key habitat.

The Humboldt-Toiyabe National Forest administers grazing within the Desert Creek - Fales PMU on National Forest land. Grazing allotments, season of use, and past use are summarized in Table 4.2.

Table 4-2. Livestock grazing allotments and season of use in the Desert Creek Fales PMU.

Allotment Name	Sage Grouse Seasonal Habitat	Land Manager	Class of Livestock	Livestock Season of Use
Rickey Peak	unknown	USFS	Sheep	6/28-9/30
South Swauger	unknown	USFS	Sheep	7/1-9/10
Little Walker	breed, nest, early-late brood	USFS	Cattle	6/16-9/15
Poison Creek	nest, early-late brood	USFS	Sheep	6/19-9/25
Junction	unknown	USFS	Cattle	6/16-9/24
Mount Jackson	unknown	USFS	Cattle	6/16-9/30
Sierra Blanca	unknown	USFS	Cattle	6/16-9/15
North Swauger	unknown	USFS	Sheep	7/21-8/5
Burcham	breed, nest, early-late brood	USFS	Sheep	7/1-9/15
Cottonwood	breed, nest, winter	USFS	Sheep	7/1-9/15
Sweetwater	breed, nest, early-late brood, winter	USFS	Cattle	6/16-10/15
Frying Pan-Murphy Creek	late brood	USFS	Cattle	6/16-9/20
Desert Creek	late brood	USFS	Cattle	7/15-8/15
Desert Peak	late brood	USFS	Sheep	5/19-6/18
Risue	unknown	USFS	Sheep	5/19-6/18
Topaz	none	USFS	Cattle	11/15-5/25
Wild Oat	none	USFS	Sheep	4/1-5/15
Simpson	late brood	USFS	Cattle	Vacant
Saroni Canal	unknown	USFS	Sheep	4/1-5/18
Fourmile	breed, nest	USFS	Cattle	11/15-1/15
Dalzell	nest	USFS	Cattle	1/16-2/28
Conway	early-late brood, winter	USFS	Cattle	12/11-2/14
Bald Mountain	late brood, winter	USFS	Sheep	5/16-6/15
Nye Canyon	late brood, winter	USFS	Cattle	6/16-9/15
Sulfur (Spring)	winter	USFS	Sheep	4/16-5/24
Sulphur (Winter)	winter	USFS	Sheep	12/16-3/15
Missouri Flat	unknown	USFS	Cattle	11/1-1/31
Wellington Springs	winter	USFS	Sheep	4/16-5/15
Wheeler Flat	unknown	USFS	Cattle	11/1-2/28
Gray Hills	unknown	USFS	Sheep	1/1-12/31
Sugarloaf	unknown	USFS	Sheep	12/16-2/28
Pine Grove	winter	USFS	Sheep	5/25-6/27

Current management practices on National Forest allotments in the PMU are providing adequate nesting cover and brooding habitat. There has been no grazing in the Desert Creek lek area for the past several years. Cattle graze the Sweetwater lek area during late spring, after nesting, and utilization levels have been moderate. No grazing occurs in the Fales/Wheeler area during the nesting season.

Livestock grazing occurs throughout the Desert Creek – Fales PMU under the authority, permitting, and management of the National Forest Service Bridgeport Ranger District. Grazing allotments and seasons of use in the Desert Creek – Fales PMU are summarized in Table 4-2. All other livestock grazing is found on private land with in the PMU.

Additional Data Needs to Verify and Further Characterize the Risk:

- Continue to monitor utilization or stubble height at known nesting sites prior to the nesting season. This includes Desert Creek, Sweetwater, Fales and Wheeler Flat leks.

- Monitor utilization or stubble height on late brooding habitat. This includes Wheeler Flat, Sweetwater, Fales, Jackass Springs and numerous other sources in the Sweetwater Mountains.

- Evaluate the ecological condition of known nesting habitat to determine the potential for producing optimal nesting habitat as described in the WAFWA Guidelines. This includes Desert Creek, Sweetwater, Fales and Wheeler Flat lek areas.

- Inventory and conduct Proper Functioning Condition (PFC) evaluations on meadows and riparian habitats used or potentially used by sage-grouse. This will provide a baseline to determine the existing and potential habitat for these area and help direct efforts for management.

- Monitor birds' movements with radio telemetry to identify nesting, early brood, and late brood habitats to determine potential conflicts with season of grazing, use levels and class of livestock (cattle or sheep).

Initial Conservation Strategy:

- Maintain grazing management practices on National Forest allotments where current utilization levels and season of grazing are consistent with maintaining or enhancing nesting and brood habitats.

- Use an adaptive management approach during drought periods to modify grazing to provide cover requirement for nesting and forage for brooding habitat.

- Manage livestock grazing to maintain sage-grouse use on all currently used meadows.

- When possible, modify water sources to restore wet meadow and riparian habitats.

- Identify locations and install water developments and guzzlers to improve summer habitat conditions.

Conservation Action: Livestock Management

Risk: Reduction or removal of cover or forage on an annual basis. Long term reduction of cover, forage or change in species composition.

Objective:

1. Maintain grazing management practices on National Forest allotments where current utilization levels and season of grazing are consistent with maintaining or enhancing nesting and brood habitats.

2. Use an adaptive management approach during drought periods to modify grazing to provide cover requirements for nesting and forage for brooding habitat.

3. Manage livestock grazing to maintain sage-grouse use on all currently used meadows.

4. Manage existing and new water sources to restore wet meadow and riparian habitats and improve summer habitat conditions.

Actions:

1. Inventory, evaluate and monitor habitat per Additional Data Needs (above).
2. Identify developed water sources in sage-grouse habitat to determine if they are maintaining associated wet meadows and riparian habitats. Modify water developments if needed for sage-grouse habitat.
3. Develop water sources for livestock if they will maintain or improve sage-grouse habitat.
4. Identify appropriate locations and install water developments and guzzlers to improve summer habitat conditions for sage-grouse.
5. Continue to monitor habitat and birds' movements with radio telemetry to identify any ongoing conflicts. Modify grazing as necessary during drought periods.

Rationale: Management of livestock grazing needs to be done in such a way as to maintain or improve sage-grouse habitat.

Legal Authority: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest.

Procedural Requirements: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest.

Level of Partnership Commitment:

Funding Source: National Forest appropriated dollars requested for FY 200__ and in planning process for 200___; partnerships to be pursued for full implementation.

Implementation Process:

1. Project Planning: Forest Service (2004):
    a. Identify action locations
    b. Enter into budget planning
    c. Identify Proposed Action for treatment
    d. Schedule Heritage and Biological surveys
    e. Complete Environmental Analysis.
2. Project Implementation Forest Service/Partners (2005):
    a. Budget for project

b. Budget for Partners

3. Project Monitoring: Forest Service/NDOW/ CFG/Partners (2005-2006):
    a. Forest Service monitor utilization levels.
    b. NDOW/CFG continue monitoring sage-grouse populations through lek counts and brood counts.
    c. Report accomplishment to USFWS, Reno Office.

Project Area Locations: To be identified at a later date.

4.4.8 Predation

Predation on sage-grouse is a threat to the population that is affected by many conditions including availability of other prey species, habitat condition, and climate. The range and size of predator populations can be expanded by human activities such as road and fence construction, landfills, and housing development. Predator densities can also increase with the number and availability of prey species.

Predation has not been identified as a significant limiting factor for sage-grouse in the Desert Creek – Fales PMU.

Additional Data Needs to Verify and Further Characterize the Risk:

- Obtain and review predator control records from APHIS for the Desert Creek – Fales PMU area.
    a. Who: CFG, NDOW
    b. When: ongoing

- Mark and monitor sage-grouse to determine predation rates.
    a. Who: CFG, USGS, NDOW
    b. When: ongoing

Initial Conservation Strategy:

- Educate private landowners to reduce predation by domestic pets.
    a. Who: CFG, NDOW, Partners
    b. When: ASPS

- Provide optimal habitat of sage-grouse for all seasons to minimize predation.

4.4.9 Hunting

Hunting is the physical act of removing individual birds from the population. However, hunting seasons are only scheduled when specific population criteria are met. Currently there is no hunting within the Desert Creek - Fales PMU.

Initial Conservation Strategy:

- Continue routine population monitoring to assess trends in breeding populations and annual production.
    a. Who: CFG, NDOW, Partners
    b. When: ongoing

- Permit and schedule hunting seasons only when specific population criteria indicate that the population will not suffer from loss of individuals.
    a. Who: CFG, NDOW, Partners
    b. When: ongoing

5.0 BODIE PMU

5.1 PMU Description

5.1.1 Location and Boundary

The Bodie PMU encompasses 349,630 acres in northern Mono County, California. The majority of the PMU is located north of California State Route 167 and east of US Highway 395 in the Bodie Hills. Adjacent portions of the Mono Basin, Bridgeport Valley, and east slope of the Sierra Nevada comprise the remainder of the PMU. The north half of Mono Lake constitutes about 7% of the PMU area. The Bodie PMU is bounded on the north by the Desert Creek-Fales PMU, the east by the Mount Grant PMU, and the south by the South Mono PMU (Figure 5.1.1-1).

The PMU boundary follows the East Walker River from the California-Nevada state line, southwest through Bridgeport Valley, then along Sawmill Ridge to Robinson Peak. From Robinson Peak, the boundary trends southeast along the upper elevations of the east slope of the Sierra Nevada to Lee Vining Peak. From Lee Vining Peak, the boundary drops into the lower elevations of the Mono Basin and continues easterly to the California-Nevada state line. The boundary then follows the state line northwest to the East Walker River.

5.1.2 Land Ownership and Regulatory Jurisdictions

Land ownership in the Bodie PMU is predominantly public with nearly 74% of the PMU managed by the Bureau of Land Management (BLM) and the US Forest Service (USFS). The BLM, Bishop Field Office, is responsible for management of the largest portion of the PMU. The Humboldt-Toiyabe National Forest (HTNF), Bridgeport Ranger District, and the Inyo National Forest (INF), Mono Ranger District, manage National Forest lands in the PMU. Private lands comprise about 17% of the PMU, with some private lands in the northern Mono Basin owned and managed by the City of Los Angeles, Department of Water and Power (DWP). State of California lands comprise about 2% of the PMU and include Bodie State Historic Park, Green Creek Wildlife Area, East Walker Wildlife Area, Wilson Creek Wildlife Area, and a few scattered school sections. Native American reservation lands under jurisdiction of the Bridgeport Pauite Colony represent less than 1% of the PMU. Land ownership in the Bodie PMU is summarized in Table 5.1.2-1.

The existing land ownership pattern is primarily the result of early mineral development and ranching activities. Numerous, often small and isolated, private parcels are distributed throughout the PMU. A large block of private land occurs in Bridgeport Valley (Figure 5.1.2-1). Many of these private parcels are associated with perennial water and provide important sage-grouse habitat. Significant historic human population centers and associated development occurred in the vicinities of Bodie, Bridgeport, Masonic, Lundy and Dunderberg. Contemporary residential and commercial development is predominately clustered along the corridors of US Highway 395, California State Route 167, and California State Route 182. Bridgeport and Mono City are the primary population centers. Residential and recreational development is also common in the Virginia Lakes and Twin Lakes basins. Additional development of the numerous private parcels traditionally associated with ranching and mining is increasing, particularly along California State Route 167 in the northern Mono Basin.

Table 5.1. Summary of Land Ownership in the Bodie PMU.

LAND MANAGER OR OWNER	ACRES	PERCENT OF PMU
Total Acres	**349,630**	**100**
Bureau of Land Management	180,022	51
Private (Including DWP)	58,952	17
Humboldt-Toiyabe National Forest	44,836	13
Inyo National Forest	36,546	10
Mono Lake	23,153	7
State of California	6,081	2
Native American	40	<1

Land use, management and development on most lands in the Bodie PMU is guided by existing land use plans. The Bishop Resource Management Plan (BLM 1993) provides direction for management of BLM lands in the PMU. National Forest Lands in the PMU are managed under direction of the Humboldt-Toiyabe National Forest Land and Resource Management Plan (USFS 1986), and the Inyo National Forest Land and Resource Management Plan (USFS 1988). The Mono County General Plan (Mono County 1992) guides land use and development on private lands in the PMU.

The southern limits of the PMU include a portion of the Mono Basin National Forest Scenic Area. Other significant Federal land use designations include BLM managed Areas of Critical Environmental Concern (ACECs) for the Bodie Bowl, Conway Summit and Travertine Hot Springs. Large portions of BLM land in the Bodie Hills and northeast Mono Basin are also designated as Wilderness Study Areas (WSAs). In addition, small portions of the Humboldt-Toiyabe National Forest along the western boundary of the PMU are identified as proposed additions to the Hoover Wilderness.

5.1.3 Topography and Climate

Elevations in the Bodie PMU range from 5,940 ft (1,811 m) to 12,380 ft (3,773 m). The majority (80%) of the PMU lies between 6,500 ft (1,981 m) and 9,000 ft (2,743 m). Mean elevation is 7,540 ft (2,298 m). Lower elevations occur in the Mono Basin, Bridgeport Valley, and along the East Walker River. Upper elevations are associated with the highest peaks of

the Bodie Hills and the east slope of the Sierra Nevada. In the Bodie Hills, elevations above 9,000 ft (2,743 m) are restricted to the environs of Bodie Mountain, Potato Peak and Masonic Mountain. The highest elevations in the PMU occur along the east slope of the Sierra Nevada near Robinson Peak, Monument Ridge, Kavanaugh Ridge, Dunderberg Peak, Mount Warren and Lee Vining Peak.

Topography is diverse with the full spectrum of slope and aspect classes well represented. Steep slopes (10-35% slope) are the dominant topographic class and comprise 39% of the PMU area. A combination of flats, very gentle slopes (0-3% slope), and gentle slopes (3-10% slope) characterize an additional 47% of the PMU. The remaining 14% of the PMU is considered very steep (>35% slope). Northerly, easterly, southerly and westerly aspects are nearly equally represented. The physiographic diversity in slope and elevation within the PMU provides for a variety of microclimatic temperature and moisture gradients.

Climate is typical of the Basin and Range Province, characterized by hot, dry summers and cold winters. Temperatures range from summer highs above 90° F to winter lows below -30° F. Bodie and Bridgeport commonly report some of the coldest recorded winter temperatures in the contiguous United States. Average annual precipitation measured at Bodie from 1964 through 2001 is 13.50". Bodie received a record high of 26.04" of precipitation in 1965 and a record low of 6.84" of precipitation in 2000 (Western Regional Climate Center 2003). Most precipitation occurs during the winter as snow. However, spring, summer and fall rains provide significant moisture in some years.

5.1.4 Sagebrush Associated Vegetation Communities and Distribution

A diversity of sagebrush species and associated vegetation communities typical of the southern Great Basin sagebrush ecosystem (Miller and Eddleman 2001) occur in the Bodie PMU. The predominant sagebrush species are mountain big sagebrush (*Artemisia tridentata spp. vaseyana*), Wyoming big sagebrush (*Artemisia tridentata spp. wyomingensis*) and low sagebrush (*Artemisia arbuscula spp. arbuscula*). Silver sagebrush (*Artemisia cana spp. viscidula*) and basin big sagebrush (*Artemisia tridentata spp. tridentata*) are also common, but occur on a considerably smaller spatial scale. Subalpine big sagebrush (*Artemisia spiciformis*) is limited to the Sierra Nevada portion of the PMU. Though not contiguous, sagebrush habitats are generally well distributed and found from the lowest to the highest elevations of the PMU.

Wyoming big sagebrush tends to be the dominant tall sagebrush variety in the lower elevation, arid portions of the PMU. Significant stands of Wyoming big sagebrush are found in the northeastern Mono Basin and on some lower elevation slopes adjacent to Bridgeport Valley. On many Wyoming big sagebrush sites, antelope bitterbrush (*Purshia tridentata var. tridentata*), basin big sagebrush and other xeric shrubs are common to co-dominant in the plant community. Singleleaf pinyon (*Pinus monophylla*), and to a lesser extent juniper (*Juniperus spp.*), are common along the upper elevation limits of many of the Wyoming big sagebrush communities. Common grass species associated with Wyoming big sagebrush in the Bodie PMU include Nevada needlegrass (*Achnatherum nevadensis*), western needlegrass (*Achnatherum occidentalis*), squirreltail (*Elymus elymoides*) and bluegrass (*Poa secunda* spp. *secunda*).

Mountain big sagebrush is the dominant tall sagebrush variety in the cooler, mid to upper elevations of the PMU. Mountain big sagebrush is typical of deeper, well-drained soils, both within and above the pinyon-juniper belt. Bitterbrush is frequently a dominant or co-dominant

component in most of the mid-elevation mountain big sagebrush communities. Singleleaf pinyon is also common in many mid-elevation mountain big sagebrush sites. At higher elevations, and on moister slopes and aspects, mountain snowberry (*Symphoricarpos oreophilus*), wax currant (*Ribes cereum*) and other montane shrubs are common associates of mountain big sagebrush. Common grass species associated with mountain big sagebrush in the Bodie PMU include Thurber's needlegrass (*Achnatherum thurberianum*), Indian rice grass (*Achnatherum hymenoides*), western needlegrass, basin wild rye (*Leymus cinereus*) and needle and thread grass (*Hespirostipa comata* ssp. *comata*).

Low sagebrush is well distributed on shallower, impermeable soils, associated with flats, ridges, and steeper slopes at the mid to upper elevations of the PMU. Frequently, low sagebrush forms a mosaic with mountain big sagebrush or mixed mountain big sagebrush-bitterbrush communities. Singleleaf pinyon, and to a lesser degree juniper, have invaded some mid-elevation low sagebrush communities in the PMU. Common grass species associated with low sagebrush in the Bodie PMU include Webber's needlegrass (*Achnatherum webberi*), June grass (*Koeleria macrantha*) and several bluegrass species (*Poa secunda ssp. secunda*, *Poa wheeleri* and *Poa nervosa)*.

Silver sagebrush is common within and along the margins of moist meadow communities at all elevations of the Bodie PMU. Notable silver sagebrush stands occur at Big Flat, upper Cottonwood Canyon, and the headwaters of Rough Creek. Basin big sagebrush is found primarily at the lower to mid-elevations of the PMU and associated with deeper, well-drained sandy or loamy soil inclusions. The majority of basin big sage habitats within the PMU are found in valley bottoms and along drainage corridors. Common grass species associated with basin big sage habitats in the Bodie PMU include basin wild rye, Indian rice grass and needle and thread grass. Subalpine big sagebrush is limited to upper elevations on the Sierra Nevada side of the PMU where it occurs on moist opens slopes and along the fringes of mountain meadows and streamside riparian habitats.

Singleleaf pinyon is common, with significant stands occurring along the lower to mid-elevation slopes of the both the Bodie Hills and the Sierra Nevada. In the Bodie Hills, large stands of pinyon are found on the northern flank adjacent to the East Walker River, on the southern flank from the Nevada border to Conway Ranch, on the eastern flank along the Nevada border, and on the western flank from Clearwater Creek to Bridgeport. Though seldom dominant, juniper is common in many of the pinyon stands in the Bodie Hills. On the Sierra Nevada side of the PMU, significant stands of pinyon occur adjacent to Bridgeport Valley from the Hunewill Hills south to Dog Creek and south of Lundy Canyon adjacent to US Highway 395 west of Mono Lake. Juniper is rare on the Sierra Nevada side of the PMU. Pinyon, and to a lesser extent juniper, encroachment is common in sagebrush communities in these areas of the Bodie PMU.

Native and irrigated meadows and streamside riparian habitats are common associates of sagebrush communities in the Bodie PMU. Though of limited overall extent, numerous small springs and associated meadows are scattered throughout the PMU. The largest meadow complexes are found in the vicinities of Bridgeport Valley, Summers Meadows, Green Creek, Sinnamon Meadows, Kirkwood Meadows, Conway Summit, Conway Ranch, Bodie Creek, Mormon Meadows, Cottonwood Creek, and the headwaters of Rough Creek. Streamside riparian habitats are associated with the headwaters of the East Walker River and the Mono Basin and are found in both the Bodie Hills and the Sierra Nevada portions of the PMU.

Other associated vegetation types include mixed evergreen forests, aspen, mountain mahogany and mixed shrub communities.

5.2 Sage-grouse Habitat Description and Condition Assessment

Most sagebrush associated upland range sites in the Bodie PMU are considered to be in mid to late-seral ecological condition. These mid to late-seral communities are generally classified as either key (R0) or understory limited (R2) sagebrush habitats. As a result, R0 and R2 are the dominant sagebrush habitat condition classes represented in the PMU. Pinyon-juniper encroached (R3) sagebrush habitats are also common, but occur on a smaller spatial scale. Sagebrush limited (R1) and potential sagebrush habitats without sagebrush (R4) are relatively rare in the Bodie PMU.

Understory limited (R2) sagebrush habitats in the Bodie PMU are characterized by a wide variety of sagebrush canopy cover and herbaceous understory conditions. Mountain big sagebrush associated R2 types with high (> 40%) shrub canopy cover and a limited native grass-forb understory are relatively common. In these sites, excessive shrub cover may be a factor contributing to limited understory conditions. In other R2 types, shrub cover is lower (15-40%) and not likely to be a factor limiting the understory. Though seldom dominant, cheat grass (*Bromus tectorum*) is a significant component in the understory of some R2 sites. Many R2 sites in the Bodie PMU have tremendous potential for sage-grouse habitat improvement. However, finer resolution mapping of R2 sites will be required to ensure the application of appropriate management techniques.

Pinyon-juniper encroached (R3) sagebrush habitats are common at the lower to mid-elevations of the Bodie PMU. Significant areas of pinyon, and to a much lesser extent juniper, encroachment can be found on all flanks of the Bodie Hills. On the Sierra Nevada side of the PMU, pinyon encroachment is occurring adjacent to Bridgeport Valley from the Hunewill Hills south to Dog Creek and south of Lundy Canyon adjacent to US Highway 395 west of Mono Lake. Juniper is rare on the Sierra Nevada side of the PMU. Many of these R3 sites provide excellent opportunities for sage-grouse habitat improvement, particularly those adjacent to leks and meadows. R3 sites that occur between known seasonal use areas or adjacent breeding populations are also good candidates for sage-grouse habitat improvement projects.

Sagebrush limited (R1) habitats in the Bodie PMU are restricted to relatively recent (< 40 years) burns, mechanical disturbances, or other site altering activities. Contemporary disturbances have been limited and affected a very small percentage of the PMU. No landscape scale fires or other disturbances have occurred over the last 40 years. During the 1960s, several herbicide sprays were conducted to reduce shrub cover in mid to upper elevation mountain big sagebrush and low sagebrush habitats in the PMU. However, sagebrush cover was quick to recover and most of these spray sites are now classified as key (R0) sagebrush habitats. Generally, R1 sites in the Bodie PMU are naturally transitioning early to mid-seral sagebrush communities in which sagebrush cover will improve over time.
Roads, housing developments, mineral material pits, and other activities that completely remove vegetation from an area characterize potential sagebrush habitats without sagebrush (R4) in the Bodie PMU. Large contiguous blocks of R4 habitat are essentially absent. To date, no type conversion of sagebrush dominated habitat to non-native annual grassland has occurred in the PMU. However, cheat grass is common and some risk of type conversion does exist, especially in the lower elevation Wyoming big sagebrush habitats adjacent to Bridgeport Valley. Some lower to mid-elevation mountain big sagebrush sites are also at risk

of conversion to non-native annual grassland. This risk is greatest on dryer, south and west facing slopes and sites where pinyon encroachment has increased the potential for a large, hot fire. R4 habitat restoration opportunities are generally limited to small, isolated sites in the Bodie PMU.

5.2.1 Breeding Habitat

The Bodie PMU includes one of the largest breeding complexes in the Bi-State Planning Area. To date, 29 different leks have been mapped within the boundary of the PMU. Of these, 8 appear to be dependable long-term strutting locations based on review of lek coding, geographic location, and male attendance. Of the remaining 21 mapped locations, 6 appear to be satellite leks, 6 may represent either satellites or changes in lek focal activity, and 6 are one-time observations of strutting males. The significance of 4 cannot be determined as documentation other than a mapped location is lacking.

Leks in the Bodie PMU are arrayed roughly in a mid-elevation ring surrounding Bodie Mountain and Potato Peak (Figure 5.2.1-1). The easternmost lek (11/12), on Dry Lakes Plateau near the Nevada border, and the westernmost lek (10), at Lower Summers Meadow west of US Highway 395, are separated by a distance of 11.6 miles (18.6 km). The northernmost lek (7/8) at Big Flat and the southernmost lek (5/6) at Bridgeport Canyon are 16.3 miles (26.2 km) apart. Leks range in elevation from 6,820 ft (2,079 m) at Lower Summers Meadow (10) to 8,450 ft (2,576 m) at the Racetrack (4) near Bodie State Historic Park. Mean elevation of all mapped strutting locations is 7,874 ft (2,400 m). Leks are on wet and dry meadows, dry lakes and low sagebrush sites. In general, sagebrush habitats are uniformly distributed around leks in the Bodie PMU. However, sagebrush tends to be irregularly distributed at the lower elevations, especially in the vicinities of lek 9 near US Highway 395 and lek 10 at Lower Summers Meadow. Pinyon, and to a lesser extent juniper, are the primary factors fragmenting sagebrush habitats in these areas.

Telemetry tracking of approximately 10 sage-grouse per year has been underway in the Bodie PMU since 1999, a cooperative effort of the California Department of Fish and Game (CDFG), the Bureau of Land Management (BLM), and the United States Geological Survey (USGS). A total of 10 nests have been located, 8 of which have hatched successfully. Nest shrub information was recorded and vegetation measurements were collected along transects centered on the nest, using a protocol developed by Idaho BLM (Sather-Blair et al. 2000) based on the guidelines (Connelly et al. 2000).

BLM found that in 1999-2002, nest sites compared favorably with shrub height, grass height, and grass cover recommendations published in the guidelines. Nest site shrub communities differed from those described in the guidelines in that shrub canopy cover tended to be greater and bitterbrush provided a major cover component. In addition, bitterbrush was often selected as a nest shrub, with no apparent detriment to nest success. Basin wild rye contributed notably to tall, dense grass cover (BLM 2003). Twenty-two forbs known to be preferred sage-grouse forage are found in the Bodie PMU. Those found during nest site evaluations included birdsfoot trefoil (*Lotus* sp., rare), milkvetch (*Astragalus* sp., sparse), hawksbeard (*Crepis* sp., sparse), phlox (*Phlox* sp., rare to common), groundsmoke (*Gayophytum* sp., scattered to common) and yarrow (*Achillea millifolium*, common to abundant) (BLM Bishop FO files).

5.2.2 Summer/Late Brood Habitat

Within the Bodie Hills, east of US Highway 395, telemetered males and hens without broods have begun moving to higher elevations in early June, followed by hens with broods during late June and early July. Both telemetry and casual observations show that throughout the remainder of the summer, significant numbers of sage-grouse concentrate around Bodie Mountain and Potato Peak, and are commonly found from about 9,000 ft (2,743 m) in elevation up to the top of Bodie Mountain near 10,170 ft (3,099 m). These high elevation summer observations also cluster around springs, streams and meadows that comprise the headwaters of Rough Creek and originate on the northern and eastern flanks of the peaks. Key areas include the upper reaches of the Paramount Mine drainage, Meadow Canyon, Rough Creek, Atastra Creek, and the small reservoir that lies between the two peaks. This results in many grouse concentrating in a small percentage of all sagebrush habitats in the Bodie PMU.

Low sagebrush and mountain big sagebrush are common at these higher elevations, with patches of bitterbrush, currant and snowberry occurring on more mesic sites. These higher elevations generally remain cooler and moister, and support forbs to a later date, than the lower elevations of the PMU. Telemetry study has thus far spanned drier than average years and continued study may reveal whether such concentrated sage-grouse use of the highest elevations during the summer is also the norm during wetter years. Further vegetation assessments may also reveal the extent to which sagebrush community characteristics at high-elevation sites altered by chemical treatments 4 decades ago may be a factor in summer habitat selection.

An apparently lesser number of sage-grouse are also found during the summer in sagebrush-associated habitats adjacent to lower elevation spring-fed or irrigated wet meadows in the western portion of the Bodie PMU. Sage-grouse in this area also summer on the high ridges dividing streams that flow out of the eastern flank of the Sierra Nevada, ranging up to the tree line at about 9,000 ft (2,743 m) and occasionally onto the higher peaks that are bare of trees. Mixed shrub communities comprised of mountain big sagebrush, bitterbrush, snowberry, currant and other montane shrubs are prominent. Pure stands of mountain big sagebrush and low sagebrush are limited west of US Highway 395. Larger meadow complexes are also a prominent feature of the western portion of the PMU. Important meadow complexes include Bridgeport Valley, Summers Meadows, Green Creek, Sinnamon Meadows, Kirkwood Meadows, Conway Summit, Conway Ranch and Mormon Meadows.

5.2.3 Winter Habitat

In 2000 through 2003, nearly all telemetered sage-grouse left summer habitats by mid-September and returned to the 7,000 ft (2,314 m) to 8,000 ft (2,438 m) level. During September-November, they tended to concentrate in the expanses of sagebrush near two of the lek areas, Big Flat (7/8) and north and east of Mount Biedeman (2). These areas have extensive, almost monotypic stands of sagebrush with what appears to be good canopy cover. In December-February sage-grouse continued to use these fall habitats, occasionally visiting higher elevations when weather conditions allowed. Use of Big Flat is also documented for a telemetered female sage-grouse from the Desert Creek - Fales PMU during the winter of 1998-1999. By March, telemetered sage-grouse had begun spreading out into all the lek areas in the PMU. Casual observations of wintering sage-grouse are recorded for the Mono Basin near Mono City and east of Mono Lake. A significant low elevation stand of Wyoming big sagebrush occurs east of Mono Lake and may provide important winter habitat in some years.

Winter telemetry observations have thus far taken place only during dry winters with less than average snowfall. During non-drought years, suitable wintering areas may be few and/or distant, as pinyon, and to a lesser extent juniper, cover much of the sagebrush habitat below 7,000 ft (2,134 m) in the PMU. Continued telemetry study through several winters of heavy snowfall will be needed to find out where sage-grouse go when snow completely covers much of the sagebrush in the Bodie PMU. Aircraft tracking support during the winter months is crucial to gaining this information.

5.3 Sage-grouse Populations

5.3.1 Population Characteristics and Distribution

Sage-grouse in the Bodie PMU exhibit at least 2 of 3 seasonal movement patterns described in the guidelines (Connelly et al. 2000): 1) Non-migratory, with well-integrated seasonal habitats; and 2) One-stage migratory, with distinct summer areas and integrated winter and breeding areas. To date, no evidence of two-stage migratory movement has been documented. However, as described above, severe winters with deep snow conditions may necessitate a two-stage migratory pattern.

Connelly et al. (2000) also identify active leks separated by $\leq$ 12.4 miles (20 km) as belonging to a single breeding population. Applying this definition to active leks within the Bi-State Planning Area indicates that sage-grouse in the Bodie and Mount Grant PMUs comprise one breeding population. Currently, the northernmost active lek (Big Flat) in the Bodie PMU is only 7.9 miles (12.7 km) from the southernmost active lek (China Camp #2) in the Mount Grant PMU. Comparison of active vs. inactive leks shows no significant reduction in the overall extent of breeding range within the Bodie PMU. However, the loss of strutting activity at 3 of the southernmost leks (Aurora, Mud Springs and China Camp #1) in the Mount Grant PMU indicates some reduction in breeding range for the combined Bodie-Mount Grant population (Figure 5.3.1-1).

To the north, active leks near Sweetwater Summit in the Desert Creek Fales PMU are separated by just over 14.3 miles (23 km) from the northernmost active leks in the Bodie and Mount Grant PMUs. To the south, the northernmost active lek (Parker Meadows) in the South Mono PMU is about 17.4 miles (28 km) south of the southernmost active lek (Bridgeport Canyon) in the Bodie PMU. A female sage-grouse radioed by the Nevada Department of Wildlife (NDOW) during the spring of 1998 near Sweetwater Summit in the Desert Creek/Fales PMU moved into the Bodie PMU near Big Flat later that fall, a distance of about 14.3 miles (23 km). The movement of this hen documents some interaction between these two breeding populations. To date, no similar movement between the Bodie and South Mono PMUs has been documented.

5.3.2 Population Estimates and Trends

Annually, the California Department of Fish and Game (CDFG), Bureau of Land Management (BLM) and other agencies cooperate to assess the status of sage-grouse breeding populations in Mono County, California. Annual efforts include surveying all known leks for activity, searching for new leks, and obtaining peak counts of male attendance at each known lek. Initial population monitoring efforts in the Bodie Hills began in 1953 with the counting of just three leks (1, 2 and 3). A fourth lek (4) was discovered in 1957, followed by the addition of satellites 2a and 2b in 1970, leks 5/6, 7/8, 9 and 10 in 1976, lek 11/12 in 1977, and satellite

2c in 1980. To date, a total of 8 dependable, long-term leks and several associated satellite grounds have been identified in the Bodie PMU (see Section 5.2.1 Breeding Habitat).

Beginning in 1987, the method for conducting lek counts was standardized in an attempt to obtain the annual single day peak male attendance for all known active leks in the Bodie PMU. The method used to establish the annual single day peak count typically involves 1 experienced person counting each active lek on at least 3 separate days during the period when female and male presence is at a maximum (Connelly et al. 2003). The annual single day peak count is reported for the day with the highest cumulative number of males counted on all active leks visited within the PMU. Leks are monitored for activity beginning in March to judge the likely period of peak lek occupation. Annual monitoring efforts prior to 1987 did not always involve multiple lek counts because of constraints associated with personnel, weather and access.

Connelly et al. (2000) summarize the limitations of lek counts and recommend that population assessments based on lek counts be viewed with caution. Despite those limitations, they also recognize that lek counts provide the best index to breeding population levels and trend. Population estimates and trends based on annual lek surveys for the Bodie PMU are provided below.

Population Estimates

Two population expansion estimators, Emmons and Braun (1984) and Walsh (2002), were used to estimate the upper and lower limits of the most recent spring sage-grouse population in the Bodie PMU. The low estimate (Emmons and Braun 1984) assumes that there are 2.00 hens per male and that the number of undetected males (adult and juvenile males not observed on leks) is 25% that of visible males. The high estimate (Walsh 2002) assumes that only 50% of all males attend leks and that there are 2.73 hens per male. The assumption that 10% of all leks in the PMU are still undetected was applied to both estimators. Based upon the average of annual single day peak lek counts conducted in the Bodie Hills breeding complex from 2001-2003, the most recent spring population estimate for the California segment of the combined Bodie-Mount Grant breeding population is between 560 and 830 sage-grouse.

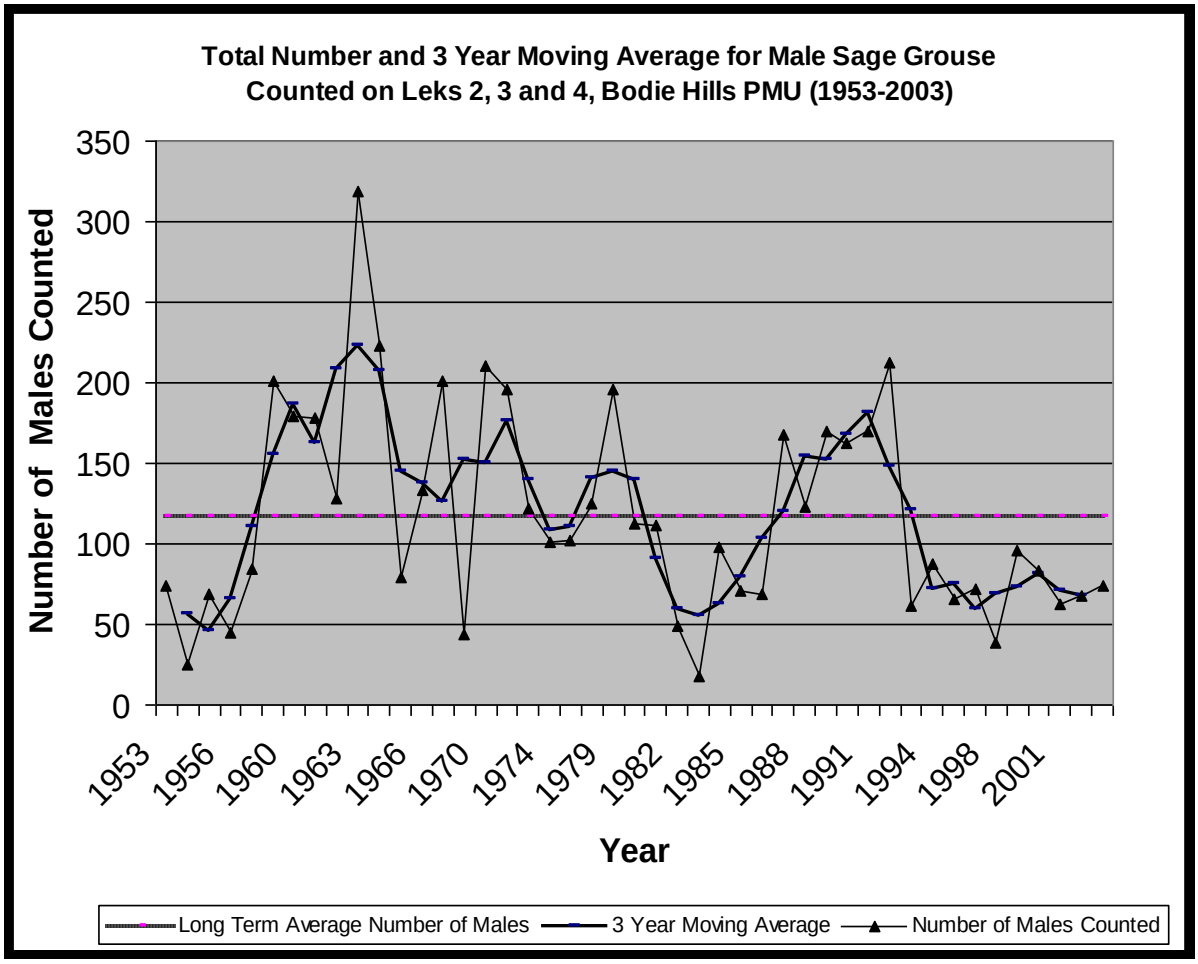
Sage-grouse hunting in the Bodie PMU is currently managed under a limited quota permit system. The current system was established in 1987, following a 4-year season closure, when CDFG established the North Mono and South Mono hunt areas. Annual permit quotas are determined separately for each hunt area based on the estimated fall population as derived from lek counts and estimated production. The need to develop breeding population estimates for each hunt area requires that lek surveys reflect the peak single day male count (Connelly et al. 2003). The peak single day count typically provides a more conservative population estimate than peak counts for each individual lek.

Population Trends

Long-term Trend (1953-2003). Three leks (2, 3 and 4) were used to assess the long-term breeding population trend in the Bodie PMU. These three leks were used for evaluating long-term trend because 1) they have been consistently counted by sage-grouse managers since 1953, and 2) they function as core leks that on average represent 73% of all males counted annually in the Bodie PMU. The highest total number of strutting males observed on leks 2, 3 and 4, including associated satellite leks, for years in which adequate data exist was 319 in 1963 (Figure 5.3.2-1). The lowest number of males counted on these three leks combined for those years in which adequate data exist was between 45 and 50 in 1956, 1969, 1982 and

1998. Since 1953, the average number of males, hereafter referred to as the long-term average, counted on leks 2, 3 and 4 was 117 (Figure 5-1).

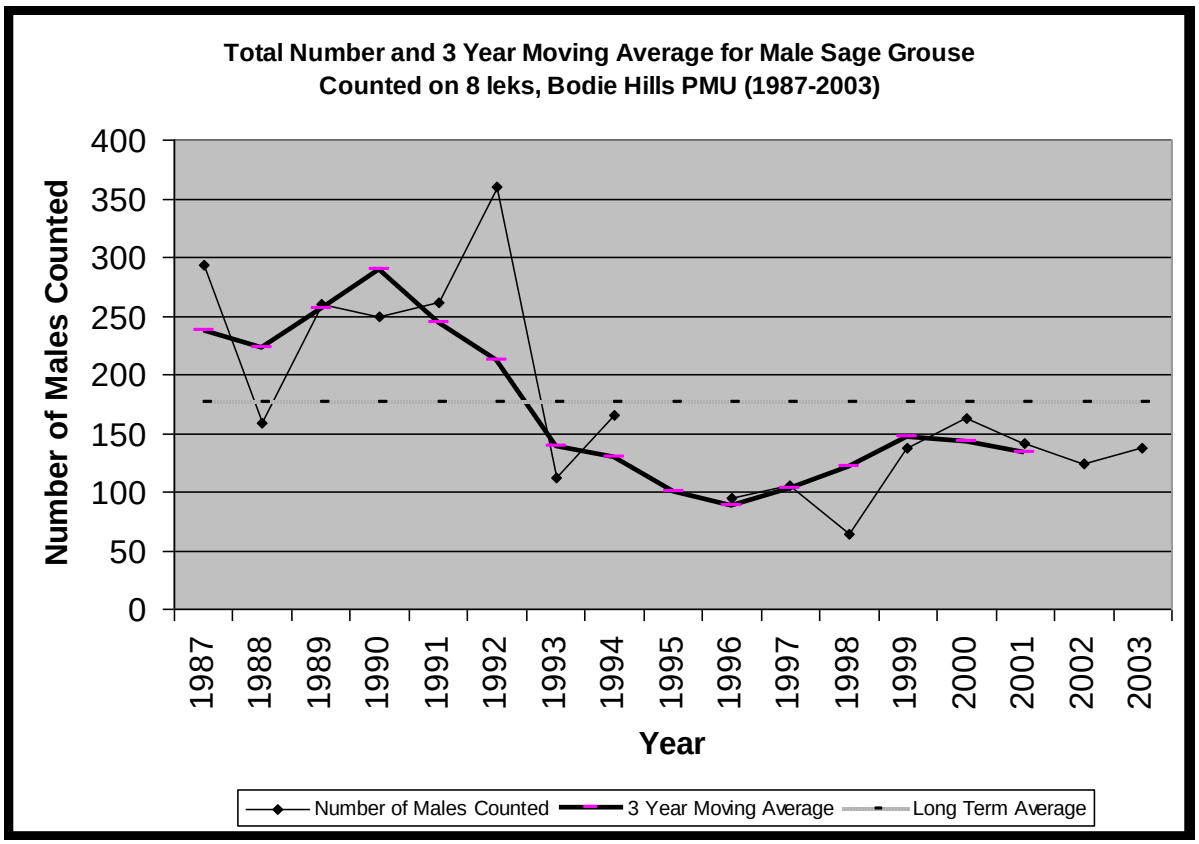
Figure 5-1. Total Number and 3-year Moving Average for Male Sage Grouse Counted on Leks 2,3, and 4 in the Bodie PMU (1953-2003).



The long-term trend in breeding population for the Bodie PMU from 1953 to the present was evaluated for leks 2, 3 and 4 using a three-year moving average, where each year is an average of that year and the year before and after. This trend is marked by several distinct changes in population. From 1959-1980, three-year moving averages for the number of males counted were near, or well above, the long-term average (Figure 5.3.2-1). This era was highlighted by the period from 1959-1965 when the breeding population was at its highest level, indicated by three-year moving averages that ranged from 124% to 191% of the long-term average. This trend was reversed from 1981-1986 when three-year moving averages ranged from 47% to 88% of the long-term average. From 1988-1992, the trend in breeding population increased, with three-year moving averages ranging from 126% to 155% of the long-term average. This upward trend was again reversed from 1993-2002, when three-year moving averages ranged from 50% to 69% of the long-term average. The trend has been relatively stable over the last three years (2000-2003) at between 58% and 63% of the long-term average (Figure 5.3.2-1).

Recent Trend (1987-2003). Because more leks have been consistently counted in recent years, the trend in peak male attendance from 1987-2003 was also evaluated for 8 core leks using three-year moving averages (Figure 5-2). These 8 core leks include leks 2, 3 and 4 which were used to assess the long-term trend, plus leks 5/6, 7/8, 9, 10 and 11/12. This analysis excludes the 1995 count because it was based on a one-time helicopter survey that yielded results not comparable to ground surveys. From 1987-2003, the highest total number of strutting males observed on all 8 leks combined, including associated satellite leks, was 360 in 1992 (Figure 5-2). The lowest number counted was 64 in 1998. The long-term average number of breeding males for the period was 178.

Figure 5-2 Total Number and 3-year Moving Average for Male Sage Grouse Counted Eight Leks in the Bodie PMU (1987-2003).



For these 8 core leks, the trend in breeding population for the period from 1987-2003 was marked by two distinct changes in population similar to that defined by leks 2, 3 and 4. From 1989-1992, the trend in strutting males remained high, ranging from 141% to 205% of the long-term average. This trend was reversed from 1993-2003 when the average number of males dropped to between 36% and 94% of the long-term average. Over the last three years (2000-2003), the average number of breeding males for these 8 leks has been relatively stable at between 70% and 93% of the long-term average (Figure 5-2).

5.4 Bodie PMU Risk Assessment and Conservation Actions

Existing and foreseeable risks evaluated for the Bodie PMU include licensed hunting, predation, fences, utility lines, permitted livestock grazing, feral horses, land use change and development, mineral exploration and extraction, recreation, fire, pinyon-juniper encroachment, water distribution, quality of sagebrush habitats and quality of meadows and riparian habitats. Risk assessments for each these risks are presented in the following format: 1) An overview of the nature of the risk that includes the risk type, the habitat component or season affected, and the habitat and population scale; 2) A brief discussion of the specific habitat and population risks; and 3) A synopsis of existing management efforts and future management options and priorities.

5.4.1 Licensed Hunting

Licensed hunting was evaluated as a population risk in the Bodie PMU. Licensed hunting is a seasonal risk, with specific season dates and bag limits established by the California Department of Fish and Game (CDFG). Shotgun season traditionally occurs in mid-September, followed by falconry season beginning in early October. Depending upon prevailing weather, sage-grouse may be concentrated in late brood and summer habitats or dispersed into fall habitats during the shotgun season. Sage-grouse are most likely to be using fall and winter habitats during the falconry season. Licensed hunting is anticipated to continue into the foreseeable future and is characterized as a past, current and future risk to multiple birds within designated hunting areas in the Bodie PMU.

Hall (1995) summarized the history of sage-grouse hunting in California. The first open season was established in September 1853, and in 1901, the first bag limits (25 per day and 25 in possession) were instituted. From 1907-1986, hunting seasons and bag limits were gradually reduced and subject to periodic closures (Table 5.4.1-1). During the period of 1910-1949, open seasons ranged from 2-6 weeks in length, hunter numbers were unlimited, and bag limits were 4 grouse per day and 8 in possession. Beginning about 1950, open seasons were reduced to 2-3 days in length. Hunter numbers were still unlimited, but bag limits were reduced to 1-2 birds per day and per season. From 1950-1972, season dates coincided with Labor Day weekend and a time when sage-grouse were heavily concentrated on water. By 1973, the season was changed to mid-September in an attempt to further reduce harvest by allowing time for birds to disperse into fall habitats. The era of unlimited sage-grouse hunting permits in California ended in 1983.

Sage-grouse hunting in the Bodie PMU is currently managed under a limited quota permit system. The CDFG instituted the current system in 1987, following a 4-year season closure, when they established the North Mono and South Mono hunt areas. Annual permit quotas are determined for each hunt area based on the estimated fall population as derived from lek counts and estimated production. CDFG issues these permits annually through a statewide drawing. Sage-grouse hunting in the PMU occurs primarily in the North Mono hunt area. A very small portion of the PMU, south of California State Route 167 and east of US Highway 395, is within the South Mono hunt area. Few, if any, South Mono hunt area permit holders hunt within the Bodie PMU.

Table 5-2. Closure Patterns of Sage-grouse Hunting Seasons in California, 1907-1986.

YEAR	PATTERN OF HUNTING SEASON CLOSURE
1907-1910	Closed
1911-1930	Open
1931-1949	Closed
1950-1952	Open
1953-1958	Closed
1959-1960	Open
1961-1962	Closed
1963-1965	Open
1966-1969	Closed
1970-1982	Open
1983-1986	Closed

The North Mono hunt zone encompasses the Bodie Hills and is described as "that portion of Mono county beginning at the intersection of Highway 182 and the California-Nevada state line; south and east along the California-Nevada state line to Highway 167; west along Highway 167 to Highway 395; north along Highway 395 to Highway 182 at Bridgeport; north along Highway 182 to the point of beginning" (CDFG 2003). A description of the South Mono hunt zone boundary is provided in the South Mono PMU section.

From 1987-1997, quota numbers for the North Mono hunt area ranged from 150 to 450 permits. Season openers were held as early as September 13 and as late as October 14 (Table 5.4.1-2). By 1998, concerns over a declining population trend in the Bodie Hills prompted the CDFG to significantly reduce the number of available permits. Since 1998, the North Mono hunt area quota has not exceeded 25 permits. Only 10 permits were issued in 2003. Season length is currently limited to 2 days with a bag limit of 1 sage-grouse per season. Annual permit quotas are combined for shotgun, archery and falconry.

Direct mortality of sage-grouse from hunting is a potentially significant population risk. In contrast to many upland game species, sage-grouse are relatively long-lived with low annual turnover (Zablan 1993, Connelly et al. 1994) and low reproductive capability (Gregg 1991, Connelly et al. 1993). Hunting may be additive to other causes of mortality (Johnson and Braun 1999, Connelly et al. 2000a) and season dates, bag limits and permit quotas must be set with caution to avoid potential over-harvest. Breeding population size, trend and geographic extent should also be considered when establishing hunting regulations (Connelly et al. 2000) to further improve harvest management. A limited permit quota system is clearly the best management option for addressing these concerns and maintaining desired harvest levels.

The termination of licensed hunting is also a potentially significant population risk. Connelly et al. (2000) recognize the importance of hunter provided wings for monitoring production and recruitment. When adequate sample sizes are available, wings provide the best measure of nest success and juvenile: adult ratios. Hunters are also recognized as valuable allies in the effort to conserve sage-grouse. Revenue derived from license fees, upland game bird stamps and federal excise taxes on the purchase of firearms and ammunition pay for the bulk of State sage-grouse population monitoring and management activities. In addition, sportsmen groups

commonly provide the funding, labor and political support needed to implement conservation actions.

Table 5.3 Sage-grouse Permits for the North Mono Hunt Area, Mono County, California, 1987-2003.

YEAR	PERMITS	BAG LIMIT DAY/SEASON	SEASON DATES
1987	300	1/1	Oct 10-11
1988	300	1/1	Oct 8-9
1989	300	1/1	Oct 14-15
1990	300	1/1	Oct 13-14
1991	450	1/1	Oct 5-6
1992	450	1/1	Oct 3-4
1993	300	1/1	Oct 2-3 (falcon Oct 9-Dec 7)
1994	300	1/1	Oct 1-2 (falcon Oct 8-Dec 6)
1995	150	1/1	
1996	150	1/1	
1997		1/1	
1998	20	1/1	
1999	20	1/1	
2000	25	1/1	
2001	25	1/1	
2002	25	1/1	Sept 14-15 (falcon Oct 1-Dec 2)
2003	10	1/1	Sept 13-14 (falcon Nov 1-Dec 31)

Licensed hunting is characterized as a manageable risk, with current permit numbers very conservative and well below the maximum harvest rates ($\leq$10% of the estimated fall population) recommended in the guidelines (Connelly et al. 2000). Compared to other causes of direct mortality, current harvest rates are believed to be insignificant. The number of permits issued for 2003 equates to approximately 1.2% of the estimated spring population and 0.4% of the estimated fall population. CDFG's current limited-quota permit system is effective because it eliminates the potential for over harvest due to weather and other influences. Additionally, the current system employs a mail-in hunter reporting system that provides wing data necessary for evaluating harvest and production trends.

Licensed hunting is arguably the most closely regulated risk identified for the Bodie PMU; however, the Bodie PMU planning group still expressed a clear desire to improve upon existing management. Specific items identified for consideration include: 1) Identifying thresholds for season closures based on breeding population size; 2) Incorporating population trend into permit allocations; 3) Tailoring hunt area boundaries to the geographic extent of distinct breeding populations; and 4) Coordinating and standardizing harvest management strategies with the Nevada Department of Wildlife (NDOW).

Conservation Action: Licensed Hunting Management

Objectives: Ensure that licensed hunting does not adversely affect sage-grouse populations in the Bodie PMU. Maintain the current conservative approach to managing sage-grouse harvest levels in the Bodie PMU.

Actions:

1) Develop and implement a comprehensive harvest management strategy for licensed sage-grouse hunting in the Bodie PMU.
2) Maintain a conservative approach to managing harvest levels through the current limited-quota permit system.
3) Identify population thresholds for season closures.
4) Incorporate population trend data into permit allocation decisions.
5) Modify hunt area boundaries to more accurately reflect breeding populations or to protect small or at risk sub-populations.
6) Adjust season dates as necessary to moderate disproportional harvest of females and broods on water sources.
7) Improve hunter feedback requirements to facilitate data collection opportunities.
8) Coordinate and standardize harvest management strategies with the Nevada Department of Wildlife (NDOW) to ensure that similar limited-quota harvest methods are adopted and employed for any licensed hunting within the Bi-State Planning Area.
9) Re-evaluate this comprehensive harvest management strategy annually and update as needed using an adaptive management approach.

Rationale: CDFG currently lacks a comprehensive harvest management strategy for sage-grouse in the Bodie PMU, coordinated with NDOW. A comprehensive strategy should include criteria for making harvest management decisions based on breeding population extent, population trend, annual hunter success and weather influences; and should specify hunter reporting requirements and how this data will be used to evaluate harvest and production trends.

Legal Authority: All actions addressing this risk are under the management authority of the California Department of Fish and Game (CDFG).

Procedural Requirements: The California Department of Fish and Game (CDFD) will develop a formal harvest management plan for sage-grouse in the Bodie PMU.

Level of Partnership Commitment: The California Department of Fish and Game (CDFG) is committed to improving all aspects of harvest management within the Bodie PMU. The Bodie PMU planning group expressed a clear desire to improve upon existing hunting management where possible.

Funding Sources: The California Department of Fish and Game (CDFG) will fund and develop a Sage-grouse Harvest Management Plan for the Bodie PMU.

Implementation Process:

1. Review existing harvest management actions, population trend data and other information relevant to sage-grouse harvest management in the Bodie PMU.
2. Develop a Sage-grouse Harvest Management Plan for the Bodie PMU.
3. Implement the harvest management plan.
4. Annually review and, if necessary, update the harvest management plan based on the most current population trend, hunter harvest data and other information relevant to sage-grouse harvest management in the Bodie PMU.

5.4.2 Predation

Predation was evaluated as a population risk in the Bodie PMU. A host of avian and terrestrial predators capable of killing adult and juvenile sage-grouse occurs in the PMU. Potential nest predators are also common. Predation is considered a yearlong risk throughout the PMU, with the risk greatest in seasonal concentration areas. Predation is characterized as a past, current and future risk to multiple birds throughout the Bodie PMU.

Potential predators of adult and juvenile sage-grouse include coyotes, mountain lions, bobcats, golden eagles and other raptors. Potential nest predators include California gulls, ravens, snakes, coyotes, badgers, bears and small mammals. Predator population levels in the Bodie PMU are not well documented, but populations have likely rebounded from extensive predator control efforts of the late 1800s and early to mid-1900s. However, there are no clear indicators of artificially high predator numbers in the PMU. Trash dumps have the potential to artificially increase raven, gull, coyote and bear populations, but at this time community trash is collected and stored at covered transfer stations. Trash containers at Bodie State Historic Park are kept covered as well. With the possible exceptions of bears in the Bodie Hills, and ravens in Bridgeport Valley, no predator species currently appear to be increasing. Because residential development and recreational use are light in much of the PMU, predation and disturbance by free roaming and feral pets are not considered problems at this time.

Adult and juvenile sage-grouse in the Bodie PMU may be most vulnerable to predators when concentrated in seasonal use areas of limited extent; for example, leks during the spring, water sources during dry summers, or snow free sagebrush habitats (currently unknown) during winters of heavy snowfall. Mortalities among 41 telemetered sage-grouse within the PMU have in 4 instances revealed clear evidence of predation. Two were adult males killed at one lek site during the strutting season, within a few days of each other, evidently by a golden eagle. The other 2 were females during the nesting season; one had been incubating but was killed by an unknown predator while off her nest, the other was not nesting and was killed by an avian predator. Additional instances of predation probably went undetected due to lack of forensic evidence. Further information is needed to adequately assess the level of predation on sage-grouse in the Bodie PMU.

Vulnerability to nest predators begins at egg laying and continues through hatching. Nesting in the Bodie PMU generally occurs from late April through mid to late June (BLM 2003, USGS in press). Telemetry study through 4 breeding seasons has monitored 10 nesting hens with only 1 instance of nest predation. Groups of foraging California gulls from Mono Lake have been observed flying low over Bridgeport Canyon during the nesting season and one predated nest has been noticed there. Though the sample size is extremely small (n=10), nest predation does not appear to be an issue in the Bodie PMU at this time.

Predation is not known to be a significant limiting factor in the Bodie PMU and few studies have identified predation as a primary factor limiting sage-grouse populations elsewhere (Connelly et al. 2000). Currently available data for the PMU suggests high nest success and annual adult hen survival. Steep declines in the sage-grouse population for any reason, such as disease, large-scale habitat loss or severe weather could render the population critically vulnerable to predation impacts. Under such a scenario, predator control could become a viable management tool. Connelly et al. (2000) recommend that predator control be implemented only in cases where nest success of < 25%, or annual survival of adult hens of < 45% can be documented. Studies specifically addressing predator interactions are not a high

priority, but may be appropriate if the population undergoes a steep decline. Telemetry study and predator observations gathered during the course of other work in the PMU will continue to add to our knowledge.

Predation is to some extent manageable in the Bodie PMU by means of managing other factors that affect sage-grouse vulnerability to predators. Manageable human-induced factors include: 1) Free roaming or feral pets or other non-native predators; 2) Illegal dumping, which is minimal at present but has the potential to increase as transfer station fees are raised; 3) Hunting, if at levels that are clearly additive to other causes of direct mortality; 4) Fences and utility lines that create artificial predator perches or result in additive sources of direct mortality; and 5) Grazing, especially if nest success is compromised by inadequate herbaceous understory cover.

Conservation Action: Predator/Predation Monitoring And Management

Risk: Potential for predation by wild predators and/or free-roaming or feral pets to be a population-limiting factor in the Bodie PMU. (Utility poles as avian predator perches are addressed separately).

Objectives: Gather data on predators and predation in the Bodie PMU. Initiate predator control as a management tool only if deemed necessary, feasible, and likely to be effective in stabilizing or increasing sage-grouse numbers (i.e., a predator management strategy that effectively increases nest success, juvenile survival or adult survival).

Actions: Standardize and coordinate compilation of predator observations and sage-grouse predation. If predation is implicated as a population-limiting factor, initiate formal studies to assess the need for, feasibility of, and projected effectiveness of predator control measures. Initiate predator control measures as per the outcome of formal studies.

Rationale: The Bodie PMU planning group could not identify predation as a population-limiting factor based on currently available data. Observations on predator abundance and sage-grouse predation should continue to be gathered, with formal studies and predator control measures implemented if other factors reduce the population to a level at which it is not resilient to predation.

Legal Authority: Any predator control response would be legally conducted according to Federal, State and local laws by the U.S. Department of Agriculture (USDA), Animal Plant and Health Inspection Service (APHIS), Wildlife Services (WS) program. "WS is a cooperatively funded, service oriented program that provides technical assistance to requesting public and private entities" (USDA 2002). WS activities would be conducted under the direction of the California Department of Fish and Game (CDFG) and in coordination with Mono County, the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (FWS), the U.S. Forest Service (USFS), and any affected private parties in accordance with the appropriate Cooperative Agreement or Memorandum of Understanding (MOU). Work could be conducted on both private and public lands in cooperation with Federal, State and local agencies, and private organizations and individuals. Control of free-roaming pets by enforcing existing leash laws is within the authority of Mono County.

Procedural Requirements: Formal studies would be observational only and would require no more than a Memorandum of Understanding (MOU) or Cooperative Agreement among

involved parties and a Categorical Exclusion (CE) on public lands. Predator control would require a Cooperative Agreement or MOU with Wildlife Services (WS) in order to verify the need for the requested work, and to identify the roles of WS and its cooperators (USDA 2002). Typically, according to Animal Plant and Health Inspection Service (APHIS) procedures as they relate to the National Environmental Policy Act (NEPA), individual wildlife damage management actions and any related technical assistance and monitoring efforts can be afforded a CE (USDA 2002).

Level of Partnership Commitment: All participants in the Bodie PMU planning group endorse this stepped course of action.

Funding Sources: In the event that formal studies are needed, the California Department of Fish and Game (CDFG), Bureau of Land Management (BLM) and U.S. Forest Service (USFS) would seek internal funding and pursue partnerships for matching funds in the event that Wildlife Services (WS) is needed to implement a predator control.

Implementation Process:

1. Continue current predator observations:
    a. Continue telemetry study, maximizing frequency of observations to improve the chances of locating fresh kills, identifying predators, and distinguishing predation from scavenging.
    b. Continue to gather casual predator observations from other personnel in the field including researchers, agency personnel, and livestock operators.
    c. Provide a standardized format for recording predator observations and designate a person to collect, keep, and summarize the data.
    d. Designate an interdisciplinary group such as the Bi-State Technical Advisory Committee (TAC) to review and summarize the data annually.

2. If data indicate that predation may be a limiting factor, consider initiating formal predator studies, especially if the population is rendered vulnerable by sharp declines due to other causes.
    a. TAC or similar group must concur that study is warranted.
    b. Seek funding and complete any procedural requirements.
    c. Contract study. Study plan should include observation of predator numbers and predator-prey interactions at all life stages from egg to adult, assessment of habitat features that influence vulnerability to predators, and estimation of predator impacts on the sage-grouse population. The study should also address the cost, feasibility, likely effectiveness, and possible negative impacts of various predator control measures and of habitat measures to decrease prey vulnerability.

3. Initiate a pilot predator control project only if studies indicate it is necessary for protection of the sage-grouse population in Bodie PMU. The pilot project should be designed to assess the benefits and overall effectiveness of predator control, as well as economically viability and feasibility. Monitor subsequent predator and sage-grouse populations. Discontinue predator control if it is ineffective or results in negative impacts to sage-grouse or other species of concern (including predator populations if they approach unviable numbers).

4. Seek enforcement of existing Mono County regulations to control free-roaming pets in areas of concern if problems with predation or undue disturbance become apparent.

5. Educate authorities responsible for trash management regarding the importance of continuing to keep all trash contained and keeping dump fees reasonable to deter illegal dumping, in order to minimize proliferation of ravens, gulls, bears, coyotes, and other predators.

5.4.3 Fences

Fences were evaluated as a habitat and a population risk in the Bodie PMU. Fences are common in, and adjacent to, a variety of sage-grouse habitats on both public and private lands within the PMU. In addition, the construction of new fences in the PMU is likely in the foreseeable future. Principal habitats of concern include lek, night roost, nesting, early brood, late brood and summer habitats. Fences are a yearlong risk, with seasonal peaks occurring in the spring and summer, as birds concentrate near strutting grounds and late brood habitats. Fences are characterized as a past, current and future risk that affects multiple sites and multiple birds in the Bodie PMU.

Habitat risks include changes in habitat quality and habitat fragmentation. In the Bodie PMU, fences are commonly used to manage livestock or delineate property boundaries. When poorly designed and sited, such fences can be detrimental to sage-grouse habitat quality. Though fence construction may not result in direct habitat loss, fences can cause sage-grouse to avoid traditional use areas. Such habitat avoidance was observed following construction of the Bodie State Historic Park fence through the Racetrack lek and the private property boundary fence built adjacent to the Lower Summers Meadow lek. However, properly designed and sited fences are recognized as an important management tool that may be used to improve sage-grouse habitat quality.

Direct mortality of sage-grouse due to fence strikes is a potentially significant population risk. This risk is most often associated with the low-level flight of birds into leks under poor light conditions. Similar impacts are expected as sage-grouse access other small habitats of concentrated use, for example night roosts, springs and meadows. A single mortality was documented in the fence adjacent to Lower Summers Meadow during the summer of 2003. The exact date of the mortality could not be determined, but is estimated to have occurred in the late spring or summer, as the bird was leaving the meadow for nearby sagebrush-bitterbrush habitat (Nelson, BLM Bishop FO files). Similar strikes are documented in the South Mono PMU (Russi, BLM Bishop FO files), as well as other areas within sage-grouse range (Connelly et al. 2000). Fences may also provide perches for avian predators and contribute to increased predation rates. Increased predation rates are also expected to be the greatest in seasons and habitats of concentrated use.

Fencing is clearly a manageable risk; however, present management is inadequate to address sage-grouse needs. Currently, all fence construction is done at the discretion of the individual landowner or agency constructing the fence. Design and placement options capable of reducing impacts to sage-grouse are seldom incorporated into fence construction projects in the Bodie PMU. The Bishop Resource Management Plan (BLM 1993) prohibits the construction of fences on strutting grounds and requires the use of let down fences in areas where sage-grouse are susceptible to wire strikes as they enter or leave a lek. No other guidance for fence construction in or adjacent to sage-grouse habitats in the PMU exists. In addition, many existing fences within the PMU may not be adequately designed or sited to meet sage-grouse needs. The Bodie PMU planning group expressed concern about existing

fences in the following areas: Bodie State Park, 7-Troughs, Lower Summers Meadow, and small exclosure sites like 4-way Meadow and Murphy Meadow. Concern was also expressed about existing land use designations and management policies (for example, Interim Management Policy for Wilderness Study Areas) that limit fence design and placement options and often take precedence over sage-grouse habitat needs.

Conservation Action: PMU Group Review Pending

5.4.4 Utility Lines

Utility lines were evaluated as a habitat and a population risk in the Bodie PMU. Utility lines are present in several known sage-grouse use areas and several key habitat types within the PMU. The construction of new utility lines is probable in the foreseeable future, most likely to provide service to private property developments. Utility lines are a yearlong risk, with sage-grouse most vulnerable during the breeding season. Potential impacts to leks, nesting areas and early brood habitats are of particular concern. Utility lines are characterized as a past, current and future risk that affects multiple sites and multiple birds in the Bodie PMU.

Habitat risks are similar to those described for fences (see Section 5.4.3 Fences) and include reduced habitat quality and habitat fragmentation. Poles for above ground utility lines provide perches for avian predators (Ellis 1984, Ellis et al. 1989) and may cause sage-grouse to avoid the immediate area where they are placed. Roads developed for the installation and maintenance of utility lines often result in the long-term direct loss of extended linear segments of habitat. The extent to which predators use utility poles as perches within the Bodie PMU is unknown, but sage-grouse may instinctively avoid such tall objects regardless of raptor activity. Overhead utility lines have had a clear negative influence on lek attendance in northern California and strutting activity has ceased on all leks within 1 mile (1.7 km) of overhead utility lines in that region (F. Hall, CDFG, personal communication). In the 1980s, a utility line was constructed near lek 9 alongside US Highway 395, despite recommendations that the lek area be avoided. Construction of this utility line may have been a factor in the subsequent reduction in the number of strutting males observed on this lek.

Utility lines may also cause direct mortality if flying sage-grouse strike the wires (Call and Maser 1985). To date, no utility wire strikes have been documented in the Bodie PMU. As stated above, utility poles may also provide perches for avian predators and contribute to increased predation rates. In northern California, the percentage of radioed grouse lost to avian predation increased as distance between lek of capture and overhead utility lines decreased. Post capture life spans also decreased as distance between lek of capture and distance to overhead utility lines decreased (F. Hall, CDFG, personal communication). Utility pole height, location and design likely influence the extent to which utility poles contribute to sage-grouse predation. Increased predation rates are expected to be the greatest in breeding habitats. Potential impacts to strutting, nesting and brooding sage-grouse are of particular concern.

Parts of the Bodie PMU identified as having utility lines that may be negatively affecting sage-grouse include the Bridgeport Valley; the Mono Basin, including Mill Creek, Conway Ranch and the utility line adjacent to “Pole Line Road” (California State Route 167); the US Highway 395 corridor from the Mono Inn north to the Bodie Road (California State Route 270); the east slope of the Sierra Nevada from Lundy Powerhouse north to Bridgeport Valley; and the Bodie Hills from the Bodie Substation east through 7-Troughs and along Bodie Creek to the Nevada

border. There are also traces of an historic line that once provided electricity to the town of Bodie. There are no major, multi-line, high voltage utility corridors in the PMU, nor any designated corridors to accommodate such use identified in current land use plans.

Utility lines are considered a somewhat manageable risk; however, past management has been inadequate to address sage-grouse needs. Future management should focus on quantifying and reducing any negative effects of existing utility lines, as well as eliminating or substantially reducing the negative affects of new utility lines. In key habitat areas, land managers should explore opportunities to have anti-perch devices installed on existing utility poles during normal maintenance activities. Land managers should also investigate possibilities for removing old, inactive utility lines. Where feasible, new utility lines should be placed underground, located to avoid key habitats or designed to significantly reduce negative effects on sage-grouse.

Conservation Action: PMU Group Review Pending

5.4.5 Permitted Livestock Grazing

Permitted livestock grazing was evaluated as both a habitat and a population risk in the Bodie PMU. Most of the land, both public and private, in the PMU is rangeland that is grazed during some part of the year. In general, domestic livestock and sage-grouse use the same vegetation communities and the majority of suitable range in the PMU is sage-grouse habitat. Habitats of concern include lek, night roost, nesting, early brood, late brood, summer and fall habitats. However, breeding and summer habitats are most likely to be affected by domestic livestock grazing. Grazing by domestic livestock has occurred in the Bodie PMU since the late 1800s and is expected to continue into the foreseeable future. Permitted livestock grazing is characterized as a past, current and future risk to multiple sites and multiple birds in the Bodie PMU.

Approximately 75% of the Bodie PMU is within the boundaries of federal grazing allotments administered by the Bureau of Land Management (BLM), Bishop Field Office, the Humboldt-Toiyabe National Forest (HTNF), Bridgeport Ranger District, or the Inyo National Forest (INF), Mono Ranger District (Table 5-3). Though comprised of mostly public lands, these allotments also include significant private in-holdings. These private in-holdings, or base property, are frequently associated with perennial water and provide important sage-grouse habitat. Private lands are generally managed under the same grazing regime as public lands within the allotments. In the Bodie Hills portion of the PMU, several key private landowners are active participants and cooperators in the development and implementation of Coordinated Resource Management Plans (CRMPs) that address grazing management issues. Domestic livestock also graze most private land outside of federal grazing allotments in the PMU. A significant block of private rangeland and irrigated pasture occurs in Bridgeport Valley. Permitted livestock grazing is limited on State and City of Los Angeles, Department of Water and Power (DWP) lands in the Bodie PMU.

Table 5-3 Federal Livestock Grazing Allotments in the Bodie PMU.

ALLOTMENT NAME	SAGE-GROUSE SEASONAL USE	ACRES IN PMU	LAND MANAGER	CLASS OF LIVESTOCK	LIVESTOCK SEASON OF USE
Aurora Canyon		20,088	BLM	Cattle	6/15-9/30
Bodie Mountain		56,263	BLM	Cattle	6/1-10/15
Dog Creek		7,675	BLM	Sheep	6/1-10/31
Green Creek		4,384	BLM	Sheep	6/1-10/31
Little Mormon		9,974	BLM	Sheep	6/1-10/31
Mono Sand Flat*		51,085	BLM	Cattle	12/1-5/21
Mono Settlement		572	BLM	Sheep	6/1-10/31
Mormon Ranch		3,322	BLM	Sheep	7/22-10/15
Mount Biedeman		4,953	BLM	Sheep	6/1-10/31
Potato Peak		14,670	BLM	Cattle	6/1-10/31
Rancheria Gulch		26,238	BLM	Sheep	6/1-10/31
Travertine Hills		10,595	BLM	Sheep	5/17-10/31
Mono Sand Flat*		9,083	INF	Cattle	
Buckeye*		62	HTNF	Cattle	6/28-9/30
Cameron Canyon		4,245	HTNF	Sheep	6/28-9/30 (10/1-10/15)~
Dunderberg		7,001	HTNF	Sheep	6/28-9/30 (10/1-10/15)~
Eagle Creek*		91	HTNF	Cattle	7/16-9/15
Green Creek		1,308	HTNF	Sheep	Inactive
Hunewill Hills		1,186	HTNF	Cattle	5/25-6/23
Larkin Lake*		43	HTNF	Cattle	11/1-11/30
Masonic*		18,661	HTNF	Cattle	7/1-10/15
Rickey Peak*		553	HTNF	Sheep	6/28-9/30 (10/1-10/15)~
Robinson Creek*		758	HTNF	Cattle	6/1-10/15
Rough Creek*		1,741	HTNF	Cattle	6/1-10/15
Summers Meadows		2,467	HTNF	Sheep	6/16-10/31
Tamarack*		2,340	HTNF	Sheep	6/28-9/30 (10/1-10/15)~
Virginia Creek*		922	HTNF	Cattle	Inactive
Wild Horse*		642	HTNF	Cattle	12/1-5/31

*Only portions of these allotments are within the Bodie PMU.

~These allotments are managed under a four-year deferred rotation schedule. One allotment is used in the fall for two weeks (Oct 1-15) while the remaining three allotments are used in the summer (June 28-Sept 30).

Cattle are the dominant class of domestic livestock in the Bodie PMU. Cattle graze approximately 67% of the acreage within federal grazing allotments in the PMU. Cattle also graze the majority of private rangelands outside of federal grazing allotments. Sheep graze the remaining 33% of the acreage within federal grazing allotments in the PMU. Sheep grazing is limited on private rangelands outside of federal grazing allotments. Less than 1% of the acreage within federal grazing allotments in the PMU is inactive. Cattle allotments dominate the northern and eastern portions of the PMU. Sheep allotments are concentrated in the southwestern portion of the PMU (Figure 5-5).

Permitted livestock grazing is primarily a habitat quality risk in the Bodie PMU. While there is little direct scientific evidence that links livestock grazing to sage-grouse population levels, indirect evidence suggests that grazing practices that significantly reduce the height and cover of the herbaceous understory in breeding habitat may negatively affect sage-grouse populations (Connelly et al. 2000). Though the sample size is extremely small (n=10), currently available data suggests that nest success is not an issue in the Bodie PMU at this time. Grazing may also reduce herbaceous understory vigor and contribute to accelerated shrub community succession (Miller and Eddleman 2001, Wambolt et al. 2002). This may be particularly important in mountain big sagebrush communities that are prone to high (>40%) shrub canopy cover. Abundant forbs are an important source of nutrition for pre-laying hens and hens with broods (Connelly et al. 2000) and some argue that excessive shrub canopy can limit forb production (Wambolt et al. 2002). Additional habitat assessments are needed to determine the extent to which permitted livestock grazing is influencing the quality of breeding habitats in the Bodie PMU.

Meadows, riparian stringers and irrigated pastures are key components of sage-grouse late brood and summer habitats (Connelly et al. 2000, Wambolt et al. 2002) that can be degraded by incompatible domestic livestock grazing practices. These habitats tend to be limited in both extent and distribution in the Bodie PMU, particularly east of US Highway 395. In addition, both livestock and sage-grouse use tends to be concentrated around these habitats during the summer. Due to their limited extent and susceptibility to livestock grazing induced ecological changes, the availability of quality meadow and riparian habitats may be a significant limiting factor for sage-grouse in the PMU. Several studies have reported that properly managed and timed grazing can improve sage-grouse habitat quality by increasing forb availability during the spring, late brood and summer period (Neel 1980, Klebenow 1985, Miller and Eddleman 2001, Wambolt et al. 2002). Numerous opportunities to improve the quality of meadow, riparian and irrigated pasture management are available in the Bodie PMU; however, many of these sites are privately owned and continued cooperation of private landowners will be required to make appropriate changes.

Livestock management facilities such as spring developments, fences, holding pens and salting and supplemental feeding locations can also negatively affect sage-grouse habitat quality. Habitat impacts associated with permitted livestock grazing may be exacerbated by conditions that influence vegetation conditions such as fire and drought.

The elimination of grazing is also a potentially significant habitat risk. As noted above, properly managed grazing of meadows is documented as having a positive influence on sage-grouse habitat. In addition, range managers are recognized as valuable allies in the effort to conserve sage-grouse and the importance of private rangelands to sage-grouse in the Bodie PMU cannot be overstated and should not be overlooked. Land managers should strive to develop flexible grazing management strategies that address sage-grouse habitat needs as well as the economic viability of livestock operators. Management strategies that contribute to

poor private land management or the eventual subdivision and development of private rangelands could have significant long-term negative impacts on overall sage-grouse habitat quality and quantity in the Bodie PMU.

Lek disturbance and nest trampling by domestic livestock during the breeding season are potential population risks. Authorized seasons of use on most federal grazing allotments within the Bodie PMU due not begin until after June 1 (Table 5.4.5-1). This eliminates the potential for lek disturbance in the majority of the PMU. Some potential for lek disturbance exists from early season grazing in or adjacent to Bridgeport Valley; however, with the exception of lek 10 at Lower Summers Meadow, no leks are currently documented for this portion of the PMU. Most authorized seasons of use also occur after the peak of the nesting season and this significantly reduces the potential for nest disturbance or trampling. However, June hatching dates have been documented in the Bodie PMU and some potential for nest disturbance and trampling does exist for late season nesters. Sage-grouse are indeterminate nesters known to abandon nests when disturbed (Cite); but the potential for nest disturbance or trampling is also limited by permitted seasons of use, as well as livestock behavior. Except when trailing, cattle do not travel in large groups or walk directly through sagebrush habitats in a manner that would likely crush or disturb a nest site. In contrast, sheep may be more likely to disturb or trample nests due to behavior and movement patterns associated with herding. In either case, trailing is considered to have the greatest potential for direct physical impact to nesting sage-grouse. Trailing was identified as an issue in the western portion of the PMU in the vicinities of Lower Summers Meadow, Green Creek and Clearwater Creek.

Permitted grazing is considered a manageable risk with current management representing a significant improvement over historic use. Currently, all federal grazing allotments in the Bodie PMU are managed under Allotment Plans (AMPs) or Coordinated Resource Management Plans (CRMPs) developed to meet multiple resource objectives. Several key private landowners are active participants and cooperators in the development and implementation of CRMPs in the Bodie Hills portion of the PMU. Sage-grouse were frequently identified as a wildlife species of concern during the development of these plans. Still, many opportunities exist to tailor livestock management practices to better address sage-grouse needs. AMPs and CRMPs provide the mechanism for adjusting livestock management practices to take advantage of these opportunities.

The best available data specific to sage-grouse habitat requirements and rangeland management practices must be considered during the future development or revision of grazing management plans in the Bodie PMU. Special emphasis should be given to: 1) Maintenance or improvement of sagebrush communities in known breeding areas; 2) Improvement of meadow, riparian and irrigated meadow habitats; 3) Eliminating or substantially reducing trailing disturbance in breeding habitats in the western portion of the PMU; 4) Proper design, location and development of livestock management facilities; 5) Reducing impacts associated with drought conditions; and 6) Developing management strategies and incentives that encourage the long-term maintenance and improvement of private rangelands in the PMU.

Conservation Action: PMU Group Review Pending

5.4.6 Feral Horses

Feral horses were evaluated as a habitat and a population risk in the Bodie PMU. Horses occur in the southeastern portion of the PMU where they occupy known key sage-grouse use areas and key habitat types. Current use is concentrated near the 7-Troughs lek and potential winter and connectivity habitat in the northeastern Mono Basin. Impacts to lek, night roost, nesting, early brood, summer and winter habitats are of most concern. Horses are a yearlong risk, with the present risk greatest during the spring. Feral horses are characterized as a past, current and future risk to multiple sites and multiple birds in the Bodie PMU.

Feral horses have been present in the Bodie PMU for many years. Until recently, known horse use in the PMU was limited to the northeastern Mono Basin in the vicinities of Larkin Lake, Cedar Hill and Mono Sand Flat. Large groups of horses (>30) could be observed in these low elevation areas of the PMU during the winter. Horses were first observed in the mid-elevations of the PMU about 4 years ago, during spring sage-grouse strutting ground surveys. Since that time, up to 6 horses have been consistently observed near the 7-Troughs lek during the spring and summer. Other recent observations and sign of horse use in the PMU have occurred in the vicinities of Mexican Springs, Brawley Peaks, Milk Ranch Canyon and Geiger Grade near Truck Tank. A total of 18 horses were counted in the Bodie Hills portion of the PMU during a July 2003 capture effort. The best available information suggests that feral horse numbers and range are increasing in the Bodie PMU.

Habitat risks for feral horses in the Bodie PMU are similar to those described for permitted livestock grazing (see Section 5.4.5 Permitted Livestock Grazing) with potential impacts to breeding, summer and winter habitats of most concern. The principal difference is that stocking rates, seasons of use and forage utilization levels are not actively managed. Therefore, any significant increase in horse numbers or range within the PMU is anticipated to have commensurate effects on sage-grouse habitat quality. The current extent of breeding and summer habitat degradation attributable to horses in the PMU is unknown, but believed to be insignificant due to low horse numbers. The extent of winter habitat degradation is even less understood, but also believed to be insignificant because winter habitat quality is mainly dependent upon sagebrush cover, which is minimally affected by horse use. Habitat impacts associated with feral horses are exacerbated by conditions that influence vegetation conditions such as fire and drought.

Lek and night roost disturbance is a potentially significant population risk near the 7-Troughs lek. The current trend of extremely low male sage-grouse lek attendance coincident with spring feral horse use in the 7-Troughs area is cause for concern; however, horses are not assumed to be the sole contributing factor. Other risks are also likely influencing sage-grouse habitats and populations in the 7-Troughs area including fences, utility lines, permitted livestock grazing, recreation and the quality of meadow and riparian habitat.

Feral horses are a manageable risk, although the process of capture and adoption is difficult and expensive. There is no designated Herd Management Area (HMA) within the Bodie PMU and horses in the PMU are drift from the adjacent Powell Mountain Wild Horse Territory (WHT). The Humboldt-Toiyabe National Forest (HTNF), Bridgeport Ranger District, manages the Powell Mountain WHT with the Appropriate Management Level (AML) goal of 26 horses. The Bureau of Land Management (BLM) and National Forest management goal is zero horses outside of the established territory boundaries. Federal horse removal programs are active in attempts to meet these goals. In July 2003, BLM Wild Horse and Burro specialists from Ridgecrest captured and removed 26 horses from the Powell Mountain WHT. An

additional 7 horses were captured and removed from the Bodie Hills outside of the designated territory. An estimated 30 horses remain in the Powell Mountain WHT and an estimated 11 horses remain in the Bodie Hills outside of the territory. During the course of the capture, 10 of the remaining Bodie Hills horses were at least temporarily driven into the Powell Mountain WHT. Future management should focus on removing all feral horses outside of established territory boundaries and maintaining AML goals within the Powel Mountain WHT.

Conservation Action: Feral Horse Removal

Objectives: No feral horses in the Bodie PMU. Maintain horses at the Appropriate Management Level (AML) in the adjacent Powell Mountain Wild Horse Territory (WHT) in the Mount Grant PMU.

Actions: Remove all feral horses from the Bodie PMU and control horse numbers in the adjacent Powell Mountain Wild Horse Territory (WHT).

Rationale: Feral horses have been increasing in the PMU and expanding their range in key sage-grouse habitats, and all are drift from the Powell Mountain WHT. Horse numbers have been above the established Appropriate Management Level (AML) in the Powell Mountain WHT for many years. The Bureau of Land Management (BLM) has a legal obligation to remove horses outside of established HMAs. The U.S. Forest Service (USFS) has a legal obligation to manage horse numbers within the Powell Mountain WHT at AML.

Legal Authority: Horse removal is under the management authority of the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM).

Procedural Requirements: The U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) must complete a capture plan and supporting environmental documentation prior to any capture and removal effort.

Level of Partnership Commitment: No objection to horse removal has been raised during the Bodie PMU planning process. BLM is committed to its policy calling for no horses on public lands outside of established HMAs and the U.S. Forest Service (USFS) is committed to maintaining horses in the Powell Mountain Wild Horse Territory (WHT) at Appropriate Management Level (AML). Private landowners in the Bodie PMU concur that horse removal is beneficial.

Funding Sources: Horse removal is cooperatively funded by the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM). Additional out-year funding will be required to implement future captures.

Implementation Process:

1. Develop capture plans and supporting environmental documents to capture and remove horses from the Powell Mountain Wild Horse Territory (WHT).
2. Gather all feral horses in the Bodie PMU.
3. Remove horses from the Powell Mountain WHT as needed to maintain the herd at the established Appropriate Management Level (AML).
4. Continue to monitor the horse population and remain watchful for any further encroachment into the Bodie PMU.

5.4.7 Land Use Change and Development

Land use change and development was evaluated as a habitat risk in the Bodie PMU. Private lands are scattered throughput the PMU and include all sage-grouse habitat types. Several key sage-grouse use areas and important habitat types are known to occur on private lands in the PMU. Residential, commercial and recreational development of private lands in the PMU is increasing, and additional development is likely in the foreseeable future. Development of some public lands in the PMU is also likely. Land use change and development is a yearlong risk, with potential impacts to breeding, summer, winter and connectivity habitats of most concern. Land use change and development is characterized as a past, current and future risk to multiple sites and multiple birds in the Bodie PMU.

Private lands comprise about 17% of the Bodie PMU. The existing land ownership pattern developed largely to support ranching and mining, with numerous, often small and isolated, private parcels distributed throughout the PMU. The largest block of private land occurs in Bridgeport Valley. Many of the private parcels in the PMU are associated with perennial water and provide important sage-grouse habitat. Contemporary residential and commercial development is predominately clustered along the corridors of US Highway 395, California State Route 167, and California State Route 182. Bridgeport and Mono City are the primary population centers. Residential and recreational development is also common in the Virginia Lakes and Twin Lakes basins. Development of the numerous private parcels traditionally associated with ranching and mining is increasing, particularly along California State Route 167 in the northern Mono Basin. The current land ownership pattern is likely to contribute to 'leap frog' development that may have significant negative impacts on sage-grouse in the Bodie PMU.

Habitat loss and fragmentation due to land use change and development is a significant risk in the Bodie PMU. The majority of private lands in the PMU are still characterized as rangeland and the commercial, residential or recreational development of these private rangelands is of particular concern. Such land use change and development will result in the direct loss and fragmentation of sage-grouse habitat. In addition, the construction of roads, fences, utility lines and other infrastructure required to support such development will magnify the extent of habitat loss and fragmentation. Additional indirect impacts resulting from increased human presence and disturbance associated with development will further degrade sage-grouse habitat quality. Potential development in, and adjacent to, strutting, nesting, brooding, summer, winter and connectivity habitats may be especially damaging. Significant impacts to sage-grouse will likely result from the development of meadows and currently intact sagebrush habitats in the PMU. The existing land ownership pattern increases the potential for land use change and development induced habitat loss and fragmentation impacts in the Bodie PMU.

Habitat loss and fragmentation associated with land use change and development is not restricted to private lands in the Bodie PMU. Rights-of-ways for roads, utility lines, sewage treatment plants and other public purposes on public lands are frequently requested, and granted, to support development activities on adjacent private lands. Bodie State Historic Park has expressed an interest in acquiring public land for the construction of a Visitor's Center in the Bodie Hills portion of the PMU. Again, the potential for such land use change and development impacts are exacerbated by the existing land ownership pattern.

Land use change and development is considered a manageable risk with land use and development on most lands in the Bodie PMU guided by existing land use plans. Existing plans include the Mono County General Plan (Mono County 1992), the Bishop Resource Management Plan (BLM 1993), the Humboldt-Toiyabe National Forest Land and Resource Management Plan (USFS 1986), and the Inyo National Forest Land and Resource Management Plan (USFS 1988). Mono County has the primary responsibility for regulating land use and development activities on private lands in the PMU. To date, the extent of habitat loss and fragmentation attributable to land use change and development in the PMU has been limited. Private landowners and citizens of Mono County have a clear opportunity to guide future land use and development to substantially reduce impacts to sage-grouse. However, the juxtaposition of private lands and key sage-grouse habitats will make this a complex and contentious issue. The cooperation of adjacent public land managers, particularly the Bureau of Land Management (BLM), the Humboldt-Toiyabe National Forest (HTNF) and Bodie State Historic Park will be required to successfully address the problem.

The Bodie PMU planning group identified the following priorities for addressing land use change and development challenges in the Bodie PMU: 1) Update existing land use plans to incorporate appropriate guidelines and mitigation strategies specific to land use change and development in sage-grouse habitats; 2) Encourage the use of conservation easements and other incentives that promote the long-term maintenance and conservation of private rangelands; 3) Improve and streamline the land exchange process to facilitate land tenure adjustments that protect key sage-grouse habitats and maintain Mono County's private property base; 4) Develop educational information to improve private landowners understanding of sage-grouse habitat needs; and 5) Avoid public land management strategies and policies that contribute to poor private land management or the eventual subdivision and development of private rangelands.

Conservation Action: PMU Group Review Pending

5.4.8 Mineral Exploration and Extraction

Mineral exploration and extraction was evaluated as a habitat and a population risk in the Bodie PMU. Mineral exploration and extraction has played a significant role in the history of human settlement and subsequent ecological change in the PMU. The best available information indicates that significant mineral deposits remain in the PMU and mineral exploration is likely to continue into the foreseeable future. The potential for future mineral extraction is dependent upon the extent of future discoveries, as well as economic, technological and political factors that influence prospective development. Mineral exploration and extraction is characterized as a yearlong risk, with potential impacts to all sage-grouse habitat types in the PMU. Direct loss of key seasonal habitats or population disturbance during key seasonal use periods are of most concern. Mineral exploration and extraction is characterized as a past, present and future risk to multiple sites and multiple birds in the Bodie PMU.

The Bodie PMU is best known for historic hard rock mining and the extraction of gold and silver during the mining boom of the late 1800s and early 1900s. Significant blocks of public land in the PMU are under valid existing mining claims. With the exception of Dog Town, the Bodie Bowl ACEC and the Travertine Hot Springs ACEC, all public lands in the PMU are open to mineral location. Sand and gravel are also common mineral commodities in the PMU. Active and historic mineral material pits are located along Green Creek Road near the Lower

Summer Meadows lek and in the Mono Basin near Mono City and Conway Ranch. The southern portion of the PMU is within the Mono-Long Valley Known Geothermal Resource Area (KGRA). Several valid geothermal leases are present within the KGRA; however, geothermal exploration has been limited, and no geothermal development has occurred, in the Bodie PMU.

Habitat risks associated with mineral exploration and extraction include changes in habitat quality and direct habitat loss. The direct loss of habitat due to surface disturbing activities has the potential for significant long-term impacts to overall habitat quality in the Bodie PMU. Mines of the gold and silver boom era of the late 1800s and early 1900s were mainly underground and probably had minor direct impacts on the overall extent and quality of sage-grouse habitat in the PMU. Wood was in huge demand for mine timbers, smelting operations, building and heating. The consumption of trees changed the landscape to an unknown degree, such that it is uncertain whether the current extent of woodlands represents expansion or recovery relative to the mining boom era. Mining activity continued at a low level in the PMU until as recently as the 1960s, leaving a few scars in sage-grouse habitat. Some opportunity exists for the reclamation and restoration of these historically mined areas.
Present-day mining practices have the potential to disturb large areas and create associated impacts such as noise, stream sedimentation, water or soil contamination and road proliferation. Even minor disturbances may have a disproportionate impact on sage-grouse if they occur in seasonal concentration areas during the season of sage-grouse use. Recent mining activities have focused on gold and silver exploration and sand and gravel extraction. Notable proposals within the past decade include a request to conduct exploratory drilling at the old Paramount Mine near an important sage-grouse summer concentration area and a request for access to State mineral reserves near the lek area on Dry Lakes Plateau. There is also a potential for “recreational” miners to create new roads during the course of prospecting and staking claims.

Direct mortality of sage-grouse for sustenance was a major population risk and indirect effect of historic mining in the Bode PMU. The gold and silver boom of the late 1800s brought about a rapid increase in human population in mining camps such as Bodie, Masonic, Lundy, Dunderberg, Mono Diggings and Dogtown. While the population of Bodie grew from a handful of miners in 1879 to a peak of 6,000-10,000 in 1881, agricultural production lagged behind and sage-grouse were a ready food source. The extent to which sage-grouse were exploited and the potential genetic ramifications of such exploitation may never be known. The contemporary population risk is generally associated with the occasional opportunistic poaching of sage-grouse by recreational prospectors or the disturbance of sage-grouse in key seasonal habitats during mineral exploration or extraction activities.

Mineral exploration and extraction is believed to be a manageable, although potentially expensive, risk in the Bodie PMU. The current risk is generally restricted to small-scale gold and silver exploration and sand and gravel extraction activities that are considered to have minimal impacts on sage-grouse. New technology and political and economic factors that influence development potential could bring the risks associated with large-scale mineral exploration and extraction to the forefront in the future. Future management should focus on the application and enforcement of existing county, state and federal laws, regulations and policies specific to mineral development and extraction. Special emphasis should be given to: 1) Developing effective guidelines and mitigation measures designed to protect key sage-grouse seasonal use areas; 2) Developing and implementing practical reclamation techniques to restore disturbed sites; and 3) Identifying and prioritizing potential restoration sites.

Conservation Action: PMU Group Review Pending

5.4.9 Recreation

Recreation was evaluated as a habitat and a population risk in the Bodie PMU. A wide-variety of recreational activities occur in the PMU, many within or adjacent to known key sage-grouse use areas and key habitat types. Recreation is a yearlong risk, with sage-grouse particularly vulnerable to disturbance during the breeding season and other periods of concentrated use. Potential impacts to leks, nesting areas, early and late brood habitats and summer and winter concentration areas are of particular concern. Recreational use varies by season, with most activity occurring in the late spring, summer and early fall. Some recreational uses also produce predictable seasonal peaks in the level of activity. Recreation is characterized as a past, current and future risk to multiples birds and multiple sites in the Bodie PMU.

Recreation in the Bodie PMU draws visitors from a broad region including many from urban areas in southern California, the Bay Area and northern Nevada. Popular recreation activities in the PMU include camping, hiking, site-seeing, mountain biking, horseback riding, cross-country skiing, snowshoeing, off-highway vehicle use (OHV), snowmobiling, bird watching, bird dog training, fishing and hunting. Fishing, camping and hiking are the dominant recreation activities on the Sierra Nevada side of the PMU. Visitation to Bodie State Historic Park accounts for the majority of recreational use in the Bodie Hills portion of the PMU. Most recreation use occurs in the late spring, summer and early fall. Fishing and hunting season openers, holiday weekends and other special events result in short, but prominent, upsurges in visitation in the PMU. Nearly all recreation involves OHV use to some degree, as visitors use unpaved roads to reach recreation destinations. OHV use for its own sake also occurs, including a few large organized events. Winter recreation is largely dependent upon snowfall and snowmobiling, cross-country skiing and snowshoeing occur in scattered areas of the PMU when conditions allow.

The primary population risk associated with most recreational use is disturbance and displacement. Disturbance may cause sage-grouse to flush making them more vulnerable to predation. Excessive disturbance may also cause sage-grouse to avoid traditional use areas. The effects of disturbance are exacerbated when use occurs in important seasonal concentration areas, especially leks. Excessive lek disturbance by campers and bird watchers, as may occur in other PMUs, is currently not a problem in the Bodie PMU. However, it is imperative that this risk be monitored and all parties remain alert to the potential for lek disturbance. Dogs accompanying recreationists may increase the level of disturbance by flushing and may chase and kill young birds. Bird dog training is not known to occur at high levels in the PMU at this time but should also be monitored for undue disturbance to sage-grouse. In general, light, non-motorized recreation currently presents a low population risk to sage-grouse in the Bodie PMU. Sage-grouse hunting is a potentially significant population risk that is addressed specifically in a separate section (see Section 5.4.1 Licensed Hunting).

Population impacts of motorized recreation include disturbance, displacement and direct mortality from vehicle collisions. Habitat effects include accelerated erosion and the creation of new routes which may increase access to previously undisturbed areas. Impacts to wet meadows, riparian areas and currently intact sagebrush habitats are of particular concern. Developed recreation sites constructed to provide visitor services can also result in the direct loss and fragmentation of sage-grouse habitat. The results are the same as those described

for land use change and development (see Section 5.4.7 Land Use Change and Development). Developments in or adjacent to key habitats are of particular concern. Increased human presence and disturbance associated with developed recreation sites will further degrade sage-grouse habitat quality. Wildfire caused by carelessness is potentially the most catastrophic habitat risk associated with recreation in the PMU. Fire is addressed in a separate section (see Section 5.4.10 Fire).

Recreation is considered a manageable risk in the Bodie PMU. Developed recreation sites and concentrated recreation use are generally limited to the Twin Lakes basin, the Virginia Lakes basin and the vicinity of Bodie State Historic Park. Current land use plans and policies allow land managers the latitude to mitigate future impacts of recreational use on sage-grouse in the PMU. The current policy on all public lands throughout the PMU is to allow OHV use only on existing, designated routes. Land management agencies also have the authority to close unauthorized new routes and rehabilitate old routes that significantly affect sage-grouse habitat quality. Land managers also issue permits for organized and commercial events, regulating their location and timing. Snowmobile use is currently light and has not yet been addressed in terms of designating use and non-use areas.

Recreation use is predicted to increase in the Bodie PMU and land managers must be aware of changing use patterns that may negatively affect sage-grouse. Management activities must keep pace and include proactive outreach and education programs, as well as increased regulation and law enforcement effort if necessary. The Bodie PMU planning group expressed particular concern about the desire of Bodie State Historic Park to construct a Visitor's Center in the Bodie Hills, the dissemination of potentially sensitive lek location information, the potential for a catastrophic human cased fire, and the prospect of increased motorized recreational use.

Conservation Action: PMU Group Review Pending

5.4.10 Wildfire

Wildfire was evaluated as a habitat and a population risk in the Bodie PMU. The effects of both wildfire and wildfire suppression activities on sage-grouse populations and habitats in the PMU were considered. Essentially all sagebrush associated habitats in the PMU are subject to some fire related risk. Wildfire and wildfire suppression activities are a risk to several known key sage-grouse use areas and key sage-grouse habitat types in the PMU. Wildfire is a yearlong risk, with the risk of natural ignition and large fires generally restricted to the summer fire season (May–October). The risk of human caused fires is also greatest during the summer fire season. Wildfire is characterized as a past, current and future risk to multiple sites and multiple birds in the Bodie PMU.

Wildfire and wildfire suppression activities are primarily a habitat risk in the Bodie PMU. Habitat risks include direct loss of key habitats, habitat fragmentation and long-term changes in habitat quality. Population risks are largely associated with the displacement of sage-grouse from key habitats or the disturbance of sage-grouse during critical seasons of use. Increased recreational use and expansion of the wildland-urban interface increase the potential for human caused fires and may ultimately limit fire suppression and management options in the Bodie PMU.

Contemporary wildfire activity in the PMU has been limited and no significant impacts to key sage-grouse habitats have been documented. In general, most recent burns in sagebrush associated habitats in the PMU are functioning as naturally transitioning early to mid-seral sagebrush communities in which sagebrush cover will improve over time. No landscape scale fires have occurred over the last 40 years and even the largest contemporary burns in the PMU can be characterized as small. Nonetheless, the potential for a large uncontrolled wildfire to significantly impact key sage-grouse seasonal use areas is clearly recognized. The risks to nesting, early brood, fall and winter habitats are of particular concern. As with other sage-grouse habitats throughout the west, sagebrush associated habitats in the Bodie PMU with favorable characteristics for sage-grouse are most likely to burn.

Overzealous wildfire suppression activities may also lead to direct habitat loss or long-term ecological changes in habitat quality. Direct impacts associated with fire suppression techniques such as dozer lines, burnouts and similar suppression techniques may actually impede habitat recovery following a fire. For example, a dozer line in low sage habitat may take several decades to recover. In addition, years of aggressive wildfire suppression have likely contributed to the abundance of late seral shrub communities and pinyon-juniper expansion in the Bodie PMU. This abundance of late seral shrub communities and significant stands of pinyon-juniper heighten the potential for large fires. Excessive fire suppression may ultimately have a negative impact on overall sagebrush habitat quality by reducing overall habitat diversity and productivity. The risks to leks, night roost, early-brood, late brood, summer and connectivity habitats are of most concern. The long-term risks to future nesting, fall and winter habitats are also a concern.

The presence of cheatgrass in some sagebrush associated plant communities in the Bodie PMU also adds the risk of altered fire cycles and increased cheatgrass abundance. To date, no landscape scale fires or type conversion of sagebrush dominated habitats to non-native annual grasslands has occurred in the PMU. However, cheat grass is common and some risk of type conversion does exist, especially in the lower elevation Wyoming big sagebrush habitats adjacent to Bridgeport Valley. Some lower to mid-elevation mountain big sagebrush sites are also at risk of conversion to non-native annual grassland. This risk is greatest on dryer, south and west facing slopes and sites where pinyon encroachment has increased the potential for a large, hot fire.

Fire is characterized as a manageable risk, although fire management options are often expensive and unpredictable. In general, both cost and manageability are directly related to protection priorities and prevailing fire behavior. All agencies with fire management responsibilities in the Bodie PMU have existing policies and plans that direct their fire management activities. Threats to human life and property are clearly recognized as the highest priority for protection and contemporary management has largely focused on suppression. In addition, other resource values often take precedence over sage-grouse conservation needs and little fire management direction exists to ensure the long-term maintenance and improvement of key sage-grouse habitat in the Bodie PMU.

The Bodie PMU planning group identified the following priorities for addressing fire management related risks and challenges in the Bodie PMU: 1) Identification and protection of key seasonal habitats from direct loss or degradation due to catastrophic fires or inappropriate fire suppression techniques; 2) Identification of fire suppression priorities and the implementation of fire suppression techniques compatible with sage-grouse population and sagebrush associated plant community needs; 3) Identification of fire rehabilitation priorities and the development of criteria for fire rehabilitation efforts in sagebrush associated plant

communities; and 4) Use of prescribed fire, fire surrogate treatments or other appropriate actions to reduce the potential for large, catastrophic fires or to improve the ecological heath of sagebrush associated plant communities. The group also recognized the need to: 1) Improve and increase fire prevention efforts to reduce the occurrence of human caused fires; 2) Recognize the ecological differences among sagebrush species in the PMU and the expected responses to fire, fire suppression techniques and restoration efforts; 3) Evaluate historic burns to improve our knowledge of local sagebrush associated plant community responses to fire and the potential effects on sage-grouse populations and habitats; and 4) Identify local sagebrush associated communities at risk of cheat grass conversion.

Conservation Action: Fire Protection And Management

Risks: Direct loss or degradation of key sage-grouse habitats from catastrophic wildfire in the Bodie PMU. Population disturbance or habitat degradation from the application of wildfire suppression techniques or fuels management actions that may be incompatible with sage-grouse needs in the Bodie PMU. Potential long-term ecological changes to sagebrush associated plant communities in the Bodie PMU from overzealous fire suppression.

Objectives: Protect key sage-grouse habitats in the Bodie PMU from direct loss or significant degradation resulting from catastrophic wildfire. Ensure that future wildfire suppression and fuels management actions promote the maintenance or improvement of sage-grouse habitat in the Bodie PMU.

Actions: Develop and implement interagency fire management guidelines for the protection and management of sage-grouse habitats in the Bodie PMU. Include elements that address: 1) Identification and protection of key seasonal habitats; 2) Priorities for fire suppression and compatible fire suppression techniques; 3) Priorities for fire rehabilitation and criteria for rehabilitation efforts; 4) Prescribed fire and fire surrogate treatments for fuels management and habitat improvement; 5) Fire prevention to reduce human caused starts; and 6) Identification of sagebrush associated plant communities at risk of cheatgrass conversion. These guidelines must recognize the ecological differences among sagebrush species present in the Bodie PMU, and the expected responses to fire, fire suppression techniques and fire rehabilitation efforts. Incorporate these guidelines into fire management plans, land use plans and fire related activity plans for the Bureau of Land Management, Bishop Field Office, Inyo National Forest, Toiyabe National Forest, Bridgeport Ranger District and Bodie State Historic Park.

Rationale: Development and implementation of the proposed interagency fire management guidelines will address the risks and help ensure the long-term protection, maintenance and improvement of sage-grouse habitats and populations in the Bodie PMU.

Legal Authority: Development of fire management guidelines and fire management plans for public lands and national forest lands is under management authority of the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS). The California Department of Forestry and Fire Protection (CDF) is the principal authority for fire management on private and State owned wildlands in California.

Procedural Requirements: The Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) must complete appropriate environmental review prior to implementation of any fire management plan or fire related activity plan. Any subsequent land use plan updates would also require appropriate environmental review.

Level of Partnership Commitment: Several existing partnerships and cooperative agreements will facilitate completion of this action. The Bureau of Land Management (BLM), Bishop Field Office and the Inyo National Forest currently operate under a unified fire command. The Humboldt-Toiyabe National Forest and California Department of Forestry (CDF) are also current partners committed to cooperative fire management in the region. Some additional coordination will be required to ensure that Bodie State Historic Park (BSHP) is an active participant in this process.

Funding Sources: The Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) frequently receive priority funding to complete fire management planning efforts. Targeted funding may be required to ensure completion of this priority action.

Implementation Process:

1. Establish an interagency, interdisciplinary team to develop interagency fire management guidelines for the protection and management of sage-grouse habitats in the Bodie PMU.
2. Send proposed guidelines out for agency, peer and public review.
3. Review comments and finalize guidelines.
4. Complete appropriate environmental review and update applicable plans to include guidelines.
5. Periodically review the guidelines for effectiveness at protecting sage-grouse habitats and update as needed.

5.4.11 Pinyon-Juniper Encroachment

Pinyon-juniper encroachment was evaluated as a habitat and a population risk in the Bodie PMU. Significant stands of singleleaf pinyon, and to a lesser extent juniper, are found adjacent to several known key sage-grouse use areas and key habitat types in both the Bodie Hills and the Sierra Nevada portions of the PMU. Pinyon-juniper encroachment is a yearlong risk, with encroachment into currently occupied breeding, summer, fall and winter habitats of most concern. Increased tree density and expansion into adjacent non-woodland habitat types and potential connectivity habitats is also a concern. The potential contribution of pinyon-juniper densities to large catastrophic fires and the potential for long-term plant community type conversion accentuate this risk. Pinyon-juniper encroachment is characterized as a current and future multiple site, multiple bird risk.

Pinyon-juniper encroachment is primarily a habitat risk in the Bodie PMU. Habitat risks include changes in habitat quality and habitat loss or fragmentation. Pinyon-juniper encroached (R3) sagebrush habitats are common at the lower to mid-elevations of the PMU. Significant areas of pinyon, and to a much lesser extent juniper, encroachment can be found on all flanks of the Bodie Hills. Notable stands of pinyon are found on the northern flank adjacent to the East Walker River, on the southern flank from the Nevada border to Conway Ranch, on the eastern flank along the Nevada border, and on the western flank from Clearwater Creek to Bridgeport. Though seldom dominant, juniper is common in many of these pinyon stands. On the Sierra Nevada side of the PMU, pinyon encroachment is occurring adjacent to Bridgeport Valley from the Hunewill Hills south to Dog Creek, and adjacent to US Highway 395 south of Lundy Canyon west of Mono Lake. Juniper is rare on the Sierra Nevada side of the PMU. In some cases, the role of pinyon-juniper encroachment

in reducing sage-grouse habitat quality and the likely response to treatment is clear. In other cases, improved mapping and evaluation of pinyon-juniper habitats and sage-grouse needs will be needed before appropriate management strategies can be developed and implemented.

Pinyon-juniper encroachment may also be a limited population risk. Pinyon and juniper trees can function as perches for avian predators and could contribute to increased predation rates. Increased predation rates are expected to be the greatest in seasons and habitats of concentrated use. Potential impacts to strutting, nesting, brooding and wintering sage-grouse are of most concern.

Pinyon-juniper encroachment is clearly a manageable risk; however, recent management has been inadequate to address sage-grouse needs. Many pinyon-juniper encroached sites in the Bodie PMU provide excellent opportunities for sage-grouse habitat improvement, particularly those adjacent to leks and meadows. Pinyon-juniper encroached sites that occur between known seasonal use areas or adjacent breeding populations are also good candidates for sage-grouse habitat improvement projects. The Bodie PMU Planning Group identified the vicinities of lek 9 near US Highway 395 and lek 10 at Lower Summers Meadow as a priority for treatment to reduce pinyon-juniper encroachment in and adjacent to occupied breeding habitat. The group also identified sagebrush habitats adjacent to Summers Meadows, Mormon Meadows, Conway Ranch (Rancheria Gulch) and Big Alkali as potential treatment areas. The group recognized a clear need to improve mapping and evaluation of pinyon-juniper habitats in relation to sage-grouse needs. Of particular interest are potential connectivity habitats with the Mono Basin, the Mount Grant PMU and the Desert Creek-Fales PMU. The role of fire and fire surrogates in addressing long-term plant community changes and reducing the potential for large catastrophic fires should also be investigated. Concern was also expressed about existing land use policies (for example, Interim Management Policy for Wilderness Study Areas) that may limit pinyon-juniper treatment options and often take precedence over sage-grouse habitat needs.

Conservation Action: Pinyon Removal And Management

Risks: Direct habitat loss, habitat fragmentation and habitat degradation from pinyon and/or juniper encroachment into key sage-grouse habitats and adjacent non-woodland habitats in the Bodie PMU. Increased potential for catastrophic fire and long-term sagebrush associated plant community type conversions in the Bodie PMU.

Objectives: Improve sage-grouse habitat quality by treating pinyon and/or juniper encroachment into key sage-grouse habitats in the Bodie PMU. Manage pinyon and juniper in the Bodie PMU to ensure long-term connectivity between sage-grouse seasonal use areas and adjacent breeding populations. Reduce the potential for catastrophic fire and sagebrush associated plant community type conversion from excessive pinyon and/or juniper densities and continuous fuel conditions in the Bodie PMU.

Actions:

1) Remove pinyon and/or juniper in and adjacent to currently occupied breeding habitat in the Bodie PMU using the most appropriate technique (cutting, burning, chaining, herbicide application, etc) to achieve project objectives.
2) Design and implement pinyon-juniper removal projects that include a scientific research component designed to improve our knowledge and ability to effectively manage pinyon-juniper in the Bodie PMU.

3) Map and compare current pinyon-juniper extent with historic pinyon-juniper extent to assess temporal changes in pinyon-juniper distribution in the Bodie PMU.
4) Evaluate the current extent of pinyon-juniper in relation to sage-grouse habitat needs, fire ecology and sagebrush associated plant community health in the Bodie PMU.
5) Identify additional priority treatment sites and implement additional pinyon and/or juniper removal treatments to improve sage-grouse habitat and sagebrush associated plant community health in the Bodie PMU.

Rationale: Removing pinyon-juniper in and near current breeding areas is expected to bring about immediate improvement of a key habitat. The remaining actions will increase understanding of the dynamics of pinyon-juniper encroachment and effects of removal efforts, and allow long-term adaptive management to improve sage-grouse habitat conditions and connectivity.

Legal Authority: The Bureau of Land Management (BLM) has management authority for the implementation of pinyon-juniper treatments or research projects on public lands in the Bodie PMU. The U.S. Forest Service (USFS) has management authority for the implementation of pinyon-juniper treatments or research projects on national forest lands in the PMU. Pinyon-juniper treatments or research projects on private lands in the Bodie PMU are at the discretion of individual private landowners.

Procedural Requirements: The Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) must complete appropriate environmental review prior to the implementation of any pinyon-juniper treatment or research project on public lands or national forest lands in the Bodie PMU. Any treatment on public lands under Wilderness Study Area (WSA) designation must comply with the BLM's Interim Management Policy (IMP) for WSAs. Private landowners can request the assistance of the Natural Resource Conservation Service (NRCS), the California Department of Forestry and Fire Protection (CDF), or the University of California (UC) Cooperative Extension to develop and implement project plans.

Level of Partnership Commitment: The Bureau of Land Management (BLM), Bishop Field Office and Humboldt-Toiyabe National Forest, Bridgeport Ranger District were active participants and partners in the development of this action plan. The Bodie PMU planning group expressed a keen interest in pinyon-juniper management in the PMU.

Funding Sources: The Bureau of Land Management (BLM), Bishop Field Office and Humboldt-Toiyabe National Forest, Bridgeport Range District are responsible for identifying and securing funding for project implementation. Significant levels of funding will likely be required to successfully implement proposed projects. Where possible, all cooperators should work to identify and secure contributed funds and volunteer labor to support implementation. A variety of contributed funds are likely available to support project implementation on public and private lands in the PMU.

Implementation Process:

1. Project Planning:
    a. Finalize project location, define project objectives and identify proposed treatment.
    b. Complete required surveys and appropriate environmental review.
    c. Conduct pre-project monitoring.

2. Project Implementation:
    a. Secure funding and complete appropriate coordination.
    b. Implement the proposed treatment.
    c. Conduct any immediate post-implementation monitoring.

3. Project Monitoring and Adaptive Management:
    a. Monitor plant community composition and sage-grouse population response.
    b. Review monitoring data and assess success at meeting project objectives.
    c. Update project as needed and complete additional treatment required to accomplish project objectives.
    d. Keep partners and participants informed throughout.

Priority Project Area Locations:

1) Lek 9 Breeding Complex (BLM, Bishop Field Office).
2) Lek 10 Breeding Complex - Hunewill Hills/Summers Meadows Complex (BLM, Bishop Field Office, Humboldt-Toiyabe National Forest, Bridgeport Ranger District and Private).
3) Mormon Meadows (BLM, Bishop Field Office and Private).
4) Rancheria Gulch (BLM, Bishop Field Office).
5) Big Alkali (BLM, Bishop Field Office and Private).

5.4.12 Water Distribution

Water distribution was evaluated as a habitat risk in the Bodie PMU. Water availability affects both habitat quality and quantity, as sage-grouse require open water when succulent vegetation is scarce. The availability of open water may to some extent define and limit sage-grouse summer habitat in the PMU. This risk is seasonal, peaking during the dry summer months and during extended drought periods. Water distribution is characterized as a past, present and future risk that affects multiple sites and multiple birds in the Bodie PMU.

Sage-grouse summer habitat quality and extent is likely influenced by the nature of water distribution in the Bodie PMU. Telemetry study has shown that sage-grouse in the PMU tend to concentrate near available water, particularly at higher elevations, during the warmest months. Springs and streams are abundant but patchily distributed, and some of these are ephemeral during drought years. Dependable summer water sources are primarily associated with the headwaters of the East Walker River and concentrated on the east slope of the Sierra Nevada and the northeast slopes of the Bodie Hills. Few perennial water sources are found in the northern Mono Basin and on the western flank of the Bodie Hills. The eastern Mono Basin is particularly dry. A few artificial reservoirs and livestock watering troughs supplement natural water sources. The effect of water distribution on sage-grouse summer habitat quality and quantity in the Bodie PMU can be exacerbated by extended drought conditions.

Livestock water developments are frequently proposed to improve livestock distribution and may provide some benefits to sage-grouse during the summer; however, livestock overuse

may degrade the quality of sage-grouse habitats both directly adjacent to water sources and in a wider surrounding area. Livestock also tend to concentrate near water and use the same areas as sage-grouse during the summer. The potential effects of changed livestock distribution and use on sage-grouse habitat quality must be fully evaluated prior to the development of new livestock watering facilities. Shifts in livestock use patterns that significantly reduce the height and cover of the herbaceous understory in nesting areas should be avoided. Livestock watering troughs that have not been fitted with wildlife escape ramps also pose a drowning hazard. Pipelines and water developments that significantly alter spring sources and associated meadow vegetation can also negatively affect sage-grouse habitat quality (Connelly et al. 2000). Fences to exclude livestock from water sources may improve habitat conditions, but may also pose hazards to sage-grouse accessing them (see Section 5.4.3 Fences).

Sage-grouse habitat quality and quantity as influenced by water distribution is to some extent manageable in the Bodie PMU. Ongoing telemetry study and examination of habitat selection by sage-grouse in the PMU may identify areas that have suitable summer habitat characteristics except for a lack of water. Management emphasis should focus on: 1) Protecting and restoring existing water sources; and 2) Developing new water sources in or adjacent to known summer use areas. Land managers should take advantage of opportunities to improve water distribution for both livestock and sage-grouse; however; land managers must also ensure that such developments do not negatively affect key sage-grouse habitats or contribute to direct mortality of sage-grouse or other wildlife. Guidelines designed to ensure habitat protection and wildlife safety could easily be developed to address these issues. Some existing land use designations and policies (for example, Interim Management Policy for Wilderness Study Areas) may limit opportunities to improve water distribution for sage-grouse in the Bodie PMU. The Bureau of Land Management (BLM) and affected interests should strive to resolve these limitations and ensure that sage-grouse receive equal consideration when implementing such policies.

Conservation Action: Improved Access To Water

Risks: Poor water distribution may limit sage-grouse summer habitat availability in portions of the Bodie PMU. Extended drought may exacerbate the effects of poor water distribution on sage-grouse summer habitat availability in the Bodie PMU. Some natural springs and existing man-made water sources in the Bodie PMU do not provide sage-grouse safe access to water.

Objectives: Increase available sage-grouse summer habitat and mitigate extended drought conditions by improving water distribution in the Bodie PMU where appropriate. Protect natural spring sources and modify existing water developments to improve sage-grouse access to water in the Bodie PMU.

Actions:

- Evaluate sage-grouse habitat use in relation to water distribution in the Bodie PMU.
- Identify potential sites to improve sage-grouse access to water.
- If no overriding negative effects are identified, develop artificial water sources to improve water distribution.
- Identify and implement measures to protect natural spring sources.
- Modify fencing and/or install escape ramps to provide sage-grouse safe access to existing water developments.

Rationale: Identifying sites where lack of water is the main factor limiting summer habitat quality, and improving the availability of water in those places, is expected to increase usable summer habitat especially during drought conditions. Protecting existing natural water sources will maintain habitat quality. Improving safety of water sources will reduce mortality.

Legal Authority: The Bureau of Land Management (BLM) has management authority for the implementation of habitat improvement projects on public lands in the Bodie PMU. The U.S. Forest Service (USFS) has management authority for the implementation of habitat improvement projects on national forest lands in the PMU. Project implementation on private lands in the Bodie PMU is at the discretion of individual private landowners.

Procedural Requirements: The Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) must complete a project plan and appropriate environmental review prior to the implementation of any habitat improvement project on public lands or national forest lands in the Bodie PMU. Project implementation on public lands under Wilderness Study Area (WSA) designation must comply with the BLM's Interim Management Policy (IMP) for WSAs.

Level of Partnership Commitment: The Bureau of Land Management (BLM), Bishop Field Office and the Eastern Sierra Chapter of Quail Unlimited (QU) are active partners committed to the restoration, improvement and development of water sources for upland game birds in the Eastern Sierra. The local QU chapter has expressed a keen interest in habitat improvement projects to benefit sage-grouse in the Bodie PMU and has a proven track record of providing funding and labor to support such efforts. Private landowners and grazing permittees participating in the Bodie PMU planning group have also expressed an interest in partnering to improve water distribution to benefit both livestock and sage-grouse.

Funding Sources: Funding for the implementation of water development projects is readily available from Quail Unlimited (QU) and a variety of other conservation organizations. The Bureau of Land Management (BLM), Bishop Field Office, the Eastern Sierra Chapter of QU, and the Eastern Sierra Chapter of the California Deer Association (CDA) have been extremely successful at securing such funding over the past several years. The BLM and QU have also successfully secured funds through the National Fish and Wildlife Foundation (NFWF) "Answer the Call" program.

Implementation Process:

1. Evaluate sage-grouse habitat use in relation to current water distribution and identify potential project sites to improve sage-grouse access to water.
    a. Use telemetry and habitat data to identify areas of potential sage-grouse summer habitat that lack free water.
    b. Assess the potential for small water developments in these areas to improve sage-grouse summer distribution.
    c. Evaluate the expected positive and negative effects of water development on the distribution of other animals including domestic livestock and feral horses.
    d. Develop guidelines for water developments to ensure that sage-grouse are benefited.
    e. Seek cooperative opportunities to improve livestock and sage-grouse distribution by means of water development.
2. Construct guzzlers or other water developments as indicated by Step 1.
    a. Design for safe sage-grouse access.

b. Design to require minimal maintenance and maximum longevity. If labor-intensive, consider compensation for extra effort on the part of private landowners.
c. Complete project plans and appropriate environmental review including cultural surveys and Interim Management Policy (IMP) for Wilderness Study Area (WSA) notifications if necessary.
d. Implement with the assistance of volunteer labor contributed by Quail Unlimited (QU) or other conservation organizations.

3. Protect natural spring sources and modify existing man-made water developments to improve sage-grouse summer habitat and sage-grouse access to water.
    a. Ensure that fences used to protect springs and streams allow safe access to water, by means such as let-down fences, using as few wires as practical, and/or runoff outside the fence.
    b. Retrofit all existing livestock water troughs with wildlife escape ramps.
    c. Include adequate water for sage-grouse in livestock water developments, via overflow or grouse waterers.
    d. Ensure that livestock water developments do not dry up meadows.

5.4.13 Quality of Sagebrush Habitats

PMU Group Evaluation Pending

5.4.14 Quality of Meadows and Riparian Habitats

PMU Group Evaluation Complete, Draft in progress

6.0 WHITE MOUNTAINS PMU

6.1 PMU DESCRIPTION

6.1.1 Physical Location and Boundary

The White Mountain PMU encompasses 1,753,875 acres in the area of the White Mountains in western Nevada and eastern California. The White Mountain PMU contains three distinct portions including the White Mountain portion, the Truman Meadows/Candelaria Hills portion, and the Silver Peak/Magruder portion. The PMU is located in Esmeralda and Mineral counties in Nevada and Inyo and Mono counties in California. Map 1 delineates the White Mountain PMU boundaries.

White Mountains—Those portions of Esmeralda and Mineral Counties in Nevada, and Mono and Inyo Counties in California bounded on the north by U.S. Highway 6 from the California/Nevada state line north and east to the junction of Nevada State Route 264, on the east by Nevada State Route 264 south to the Nevada/California State Line, California State Route 266, thence south along California State Route 266 to the junction of California State Route 168 at Oasis, on the south by California State Route 168 to the junction of U.S. Highway 395 at Big Pine, and on the west by U.S. Highway 395 north to the junction of U.S. Highway 6 at Bishop, thence north along U.S. Highway 6 to the California/Nevada State Line.

Truman Meadows / Candelaria Hills—Those portions of Mineral and Esmeralda Counties, Nevada, bounded on the south by U.S. Highway 6 from the California/Nevada state line north and east to the junction of the Columbus Road, on the east by the Columbus Road north to the junction of U.S. Highway 95, on the north by U.S. Highway 95 north and west to the junction of the Silver Dyke Canyon Road, thence west on that road and continuing past the end of that road to the top of the Excelsior Range, thence west along the top of the Excelsior Range to the Mount Grant PMU eastern boundary near Summit Spring, on the west by the eastern boundary of the Mount Grant PMU south to the Nevada/California state line, thence south and east along the state line to the junction with U.S. Highway 6.

Silver Peak / Magruder—Those portions of Esmeralda County in Nevada and Mono County in California bounded on the north by U.S. Highway 6 from the junction of Nevada State Route 264 east to the junction of Nevada State Route 265, on the east by Nevada State Route 265 south to the junction of the Railroad Pass Road at Silver Peak, thence south along the Railroad Pass Road to the junction of Nevada State Route 266, thence west on that State Route to the junction of the Tule Canyon Road, thence south from that junction along the Tule Canyon Road to the Nevada/California State Line, on the south by the Nevada/California State Line north and west to California State Route 168, on the west by California State Route 266 from Oasis north to the Nevada/California State Line, Nevada State Route 264, thence north on Nevada State Route 264 to the U.S. Highway 6 junction.

6.1.2 Land Ownership and Regulatory Jurisdictions

Public land comprises approximately 97 percent of the land within the White Mountain PMU. The Bureau of Land Management (BLM) manages 83 percent of the PMU (Tonopah Field Station in Nevada and Bishop Field Office in California). The Inyo National Forest, White Mountain District manages 14 percent of the PMU. Various private citizens or companies and the State of Nevada own the remaining three percent of the lands.

Herd Management Areas (HMA) —Within the White Mountain PMU, the BLM manages six wild horse HMAs. The Tonopah Field Station manages Fish Lake Valley, Silver Peak, and Palmetto HMAs. Carson City Field Office manages Montgomery Pass HMA, in cooperation with the U.S. Forest Service, Garfield Flats HMA and the Marietta Burro Range. Only 9500 acres of the Garfield Flats HMA lies within the White Mountain PMU. The BLM and USFS manage for wild horses in part of the White Mountains. These horses are difficult to manage because in some areas they move freely between USFS and BLM managed lands. However, the agencies are taking measures to assess the status and condition of the horses in the region. Map 2 shows the locations of the HMAs in the White Mountain PMU. The horses are not necessarily restricted to these areas by geographic or human made features. They can move throughout the area in the White Mountains.

Table 6-1 shows the current estimated populations of these HMAs and their appropriate management levels (AML). AML is the maximum number of horses or burros the HMA can sustain to maintain a healthy ecosystem. Estimates are very conservative as they are based on average birth rates only. Currently, the estimated numbers of horses are neither so high nor dense to be considered alarming.

Table 6-1. Herd Management Area Information for White Mountain PMU

HERD MANAGEMENT AREA	APPROPRIATE MANAGEMENT LEVEL	CURRENT POPULATION ESTIMATE
Fish Lake Valley	65	60 (2003)
Garfield Flat	125	141 (2002)
Silver Peak	312	west side only 133 (2003)
Palmetto	76	3 (2002)
Montgomery Pass	184	140 (2001)
Marietta Burro Range	104	93 (2002)

Domestic Livestock—The BLM manages eight grazing allotments in the Esmeralda County portion of the White Mountain PMU, three allotments in Mineral County portion, and ____ allotments out of the Bishop Field Office. Currently, two permittees use five Esmeralda County allotments for approximately 8200 cattle animal unit months (AUM). They graze the allotments seasonally. Three permittees use the Mineral County allotments in the winter.

The Inyo National Forest manages six grazing allotments in Esmeralda, Mono, and Inyo counties from Truman Meadows in the north to Crooked Creek in the south. Cottonwood Creek and Tres Plumas are former large allotments on the east side of the White Mountains in Mono County that have been removed from active grazing since 1990 for watershed restoration for the Piute cutthroat trout. Meadow hydrology, vegetative condition, and associated sagebrush stands have improved in herbaceous species density and composition since allotment rest. Grouse have not been seen in Cottonwood in past field trips possibly because of the small, fragmented patches of sagebrush interspersed with pinyon stands and aspen groves. Approximately half of the suitable sage-grouse range is located within active grazing allotments almost entirely on the east side of the White Mountains and Truman Meadow.

Since the 1920s, Deep Springs College has had a grazing permit on the Inyo National Forest for the Crooked Creek grazing allotment. The students have collected anecdotal evidence to support the conclusion that sage-grouse have been in the area since that time. Today, the college utilizes about 690 AUMs during the months of July, August and the first half of September. In 1992, the college established the "Deep Springs Resource Management Team," a diverse group of people with management interests and concerns on the land owned and leased by the college. The members include representatives from the Inyo National Forest, the Ridgecrest BLM, the California Dept. of Fish and Game, and the Native Plant Society. For the past decade, the team has worked to plan and manage the Deep Springs grazing operation with a goal of providing a stable ranch operation for the college within the context of environmental stewardship and habitat preservation.

Areas of Critical Environmental Concern (ACEC) —ACECs are specific to BLM lands. An ACEC designation constitutes a management commitment by the BLM. BLM regulations (43 CFR part 1610) define an ACEC as an area "within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards."

To be eligible for ACEC designation, an area must meet relevance and importance criteria and require special management to protect or appropriately manage the important values. If current management provided for in the land use plan is not sufficient to protect or appropriately manage the important values, special management is needed.

The designation does not, by itself, automatically prohibit or restrict other uses or activities in an area, with the exception of the requirement of a Plan of Operations for any proposed mining activity within a designated ACEC.

Various groups and organizations have nominated 22 sites for ACEC status in Esmeralda County. For further information on these nominations please visit the following website: www.nv.blm.gov/bmountain/acec/acec_nomination_list_tfs.htm.

Wilderness Study Areas (WSA) —Two WSAs exist in the Esmeralda County portion of the PMU. Congress will make the final designation of a wilderness area on each WSA. The Silver Peak Range WSA has 33,900 acres and the Pigeon Spring WSA, west of Lida, has 3,575 acres; however, none are recommended for wilderness designation.

6.1.3 Topography And Climate

Elevations in the White Mountain PMU range from approximately 4,000 feet in the valleys to 14,246 feet on White Mountain Peak. The average elevation is 6,519 feet (1987 m). Fifty-eight percent of the area is less than 6,500 feet high, thirty-three percent of the area is between 6,500 and 9,000 feet high, and nine percent of the area is greater than 9,000 feet. The valleys run gradually into the foothills of the mountains. The mountains are very rugged and steep in places and some high meadows exist in the upper elevations. One quarter of the area is very steep scarps and cliffs (greater than 35% slope) and another quarter is gentle slopes (3-10% slope). Steep slopes (10-35% slope) account for 36% of the PMU. Only 14 percent of the PMU has flats and gentle slopes (0-3% slope). The aspects of the area are divided somewhat evenly between northerly (24%), southerly (22%), easterly (28%) and westerly (22%), with 4% no aspect or flat.

The climate has many characteristics of high, cold desert including highly variable precipitation patterns, extreme variation in daily temperature, and well-developed seasons. In the summers, The valley bottoms can attain daytime temperatures over 100 degrees F in the summers and below freezing in the winters. Precipitation varies in type and quantity. Mountainous areas receive average annual levels of snowfall around 158 inches, whereas the valley bottoms may receive none. Precipitation levels range on average from 4 inches per year in some of the drier locations to over 19 inches in the higher elevations of the White Mountains.

6.1.4 Vegetative Communities And Distribution

The Inyo National Forest surveyed habitats in Esmeralda County in 2002 to determine suitability for sage-grouse. Because of the fragmented stand nature and because no grouse were observed, the low value of these habitats became apparent even though they met criteria for suitability. Out of 16,000 acres surveyed, including Trail Canyon, Kennedy Flats and Sage Hen Flats, 2,815 acres or 17% were typed as sagebrush associations dominated by mountain big sagebrush and low sagebrush. The remaining 13,275 acres (83%) of the area were dominated by pinyon pine, followed by mountain mahogany, limber pine and high alpine barren. Most of the sagebrush stands rate as R0, key habitats since they have excellent understories of forbs and grasses and few non-native plants. Sagebrush canopy cover tends to be high but within useable guidelines.

The best continuous sagebrush habitats in the PMU are found in the southern and south central White Mountains in Mono County in the upper Crooked Creek watershed, and Chiatovich Flats where grouse are routinely seen. The sagebrush stands here are generally much larger in size and more continuous.

Salt Desert Shrub (Precipitation zones 3-5", 5-8")- Salt desert shrub occurs mainly in valleys and low hills throughout the area. These ecological sites are dominated by shadscale (*Atriplex confertifolia*), Bailey greasewood (*Sarcobatus vermiculatus baileyii*) and spiny menodora (*Menodora spinescens*). Associated species are wolfberry (*Lycium* spp.), cheeseweed (*Hymenoclea salsola*), Nevada ephedra (*Ephedra nevedensis*), bud sagebrush (*Artemisia spinescens*), winterfat (*Eurotia lanata*), Nevada dalea (*Psrothamus polydenius*), fourwing saltbush (*Atriplex canescens*), Indian ricegrass (*Achnatherum hymenoides*) and Joshua tree (*Yucca brevifolia*). Grass makes up 5 to 10% of the total production on most salt desert shrub ecological sites.

Sagebrush (Precipitation zone 8-12") - Sagebrush is found on hills and mountains in the Silver Peak Range, the Palmetto Mountains and the White Mountain range. These ecological sites are dominated either by black sagebrush (*Artemisia nova*), Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), or mountain big sagebrush (*Artemisia tridentata vaseyana)*. Associated species are green ephedra (*Ephedra viridis*), rabbitbrush (*Chrysothamnus* spp.), antelope bitterbrush (*Purshia tridentata),* cliffrose (*Cowania mexicana*), Indian ricegrass and bottlebrush squirreltail (*Sitanion hystrix*).
The higher elevation stream bottoms, slopes, and flats in the White Mountains such as Sage Hen Flat, Kennedy Flat, Pellisier Flat, Tres Plumas, and Chiatovich Flat are mosaics of mountain big sagebrush, big sagebrush *(A. tridentata tridentata),* and low sagebrush *(Artemesia arbuscula)* in association with rabbitbrush *(Chrysothamnus vicidiflorus)*, ephedra, antelope bitterbrush (*Purshia tridentata),* and snowberry *(Symphoricarpos longiflorus),* depending on soil type, and aspect. Common forbs and grasses include lupine *(Lupinus sp.)*

buckwheat, *(Eriogonum sp.),* Junegrass *(Koeleria macrantha)*, mountain brome *(Bromus carinatus),* western needlegrass *(Acnatherum occidentale,* and bottlebrush squirreltail (*Sitanion hystrix*).

Pinyon and Juniper Woodlands (Precipitation zone 10-16")- Pinyon and juniper woodlands are dominated by pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) with an understory of black sagebrush or Wyoming big sagebrush. In the White Mountains this zone occurs between 6,500 and 9,500 feet elevation.

Subalpine and Alpine Zone (Precipitation zone more than 20" at the highest elevations) - The White Mountains' subalpine zone (9,500 to 11,500 feet) is characterized by a mosaic of low, open bristlecone and limber pine forests interspersed with mountain big sagebrush, and low sagebrush types. Artemesia communities typically dominate on sandstone and granitic soil types in this zone. The alpine zone (11,500 feet to 14,246 feet) is characterized by low growing prostrate grasses, forbs, and shrubs with low sagebrush types occurring up to 12,000 feet. Low sagebrush types are widely distributed on dry, sandy soils.

Washes (Precipitation zone 3-12") - Washes are scattered throughout all other vegetation types in the area and are dominated by cheeseweed, fourwing saltbush, rubber rabbitbrush (*Chrysothamnus nauseosus*) and sagebrush (sagebrush grows in higher elevations only).

Blackbrush (Precipitation zones 5-8", 8-10") - Blackbrush (*Coleogyne ramosissima*) occurs in the higher elevations just above the hot desert vegetation and below the sagebrush in some southern portions of the area. In the lower and dryer portion of its range it is associated with shadscale, spiny menodora, creosote bush, white bursage and other shrubs in the Salt Desert and Hot Desert vegetation types. In the higher and cooler portions of its range, it is associated with Wyoming big sagebrush. Grass makes up less than 10% of the total production on most blackbrush ecological sites.

Saline Meadows and Alkaline Soils (Precipitation zone 3-8") - This vegetation type occurs on valley floors with a high water table, often at the soil surface. Black greasewood (*Sarcobatus vermiculatus*), alkali sacaton (*Sporobolus airoides*) and inland saltgrass (*Distichlis spicata stricta*) dominate the valley bottoms in alkaline and saline soils.

Hot Desert Vegetation (Precipitation zone 3-5", 5-8") - Hot desert vegetation is found on the lower elevations in the southern portion of the area. These areas are dominated by creosote bush (*Larrea tridentate*), white bursage (*Ambrosia dumosa*), shadscale, and spiny menodora. Associated species are wolfberry, Nevada ephedra, cheeseweed, spiny hopsage (*Grayia spinosa*), fourwing saltbush, cattle saltbush (*Atriplex polycarpa*), Fremont dalea (*Psorothamnus fremontii*), range ratney (*Krameria parvifolia*) and Joshua tree.

6.2 Sage-grouse Habitat Description And Condition Assessment

6.2.1 Breeding Habitat

Although the specific locations of leks have not been well documented in the White Mountains, observations of both male (not strutting) and female sage-grouse in the lower Trail Canyon area of the White Mountains during recent aerial lek searches suggest the possible existence of a lek in this area (See Current Distribution). NDOW's data base shows 5 known leks in the White Mountains PMU, currently classified as active.

Nesting and early brood habitat - Aerial lek searches and a recent telemetry project conducted in Esmeralda County by the Nevada Division of Wildlife have resulted in the identification of nesting and early brood habitat located along the east bench of the White Mountains. A series of low hills surrounding the lower end of Trail Canyon in the northern portion of the White Mountain area appears to be used for nesting and early brood rearing habitat in years when precipitation patterns result in favorable conditions (See Current Distribution). During the spring of 2001, two hens nested in the area just south of Trail Canyon. The area is typical of the Blackbrush habitat type described in the vegetative community descriptions, section 2.4.

Sage-grouse broods have also been observed in the Middle Canyon Chiatovich Creek, and Mustang Mountain areas of northern White Mountains. These areas are typical of the sagebrush vegetative community type as described in the Vegetative Community Section 2.4.

The Crooked Creek population in Mono County utilizes high elevation sagebrush slopes and terraces from 9,000 feet to over 11,000 feet throughout the breeding, nesting and brood-rearing periods. They may use this habitat year-round depending on the winter snowfall and severity. The habitat is a mosaic of mountain big sage and low sage plant associations. No information exists on exactly how high sage-grouse are found in the Whites, except that low sage plant associations occur into the alpine zone up to 12,000 feet. This habitat configuration continues north along the high flats and slopes of the range where sage-grouse are known, such as Chiatovich Flat, Kennedy Flat, and Sage Hen Flats. Below these high slopes and terraces the Whites have steep sloped drainages where sagebrush types become more fragmented, discontinuous, and more intermixed with mountain mahogany, limber pine and pinyon pine habitats. As a result these habitats may be marginal for sage-grouse. Below this zone is another foothill zone of suitable habitat between 5,500 and 7,000 feet.

Two nests were found in the Crooked Creek watershed, Mono County on the east slope of Bucks Peak in 2002. Both nests were at 10,320 feet approximately 0.2 mile apart. The nests were located in mountain big sagebrush stands near an ecotone with a low sagebrush terrace where the two species intermixed. Sagebrush canopy cover was approximately 25% (measured with line intercept) with 15 inch average height. Herbaceous cover dominated by Junegrass (*Koeleria macrantha*) was poor at less than 10% with low height and vigor from drought conditions.

6.2.2 Summer / Late Brood Habitat

Deep Springs College and the Inyo National Forest have documented observations over the years for the Crooked Creek population in Inyo and Mono Counties. Their observations show sage-grouse continue to utilize the same habitats throughout the summer as their nesting habitat. Crooked Creek itself and the associated riparian streamside and spring habitats probably are the areas the hens with broods prefer, while other birds are scattered throughout the high elevation sagebrush types possibly up into the low sagebrush stands up to 12,000 feet.

6.2.3 Winter Habitat

The recent observation of sage-grouse sign in the Volcanic Hills of Esmeralda County indicates the area may receive winter use in some years. The sage-grouse of the White Mountains and Truman Meadows areas of Esmeralda, Mono, and Inyo Counties may utilize high elevation sagebrush stands between 9,000 and 11,000 feet, as well as low elevation foothill and valley sagebrush habitats between 5,500 and 7,000 feet for winter range.

The Inyo National Forest, while surveying the upper slopes of Silver Canyon in Mono County on March 3, 2003, flushed 17 male sage-grouse from a mountain big sagebrush stand at 9,880 feet on the western slopes of the Whites. A second survey pushed up a female 1/2 mile north at 9,800 feet on March 22, 2003. In February 2003 two Inyo National Forest personnel surveyed Queen Valley in Esmeralda and Mono Counties for sage-grouse, or their sign. They saw no birds, scat or other sage-grouse sign in the sagebrush stands during the five-day survey. Their search included the valley bottom sagebrush habitats as well as the foothill slopes. The valley lies between 5,400 and 6,800 feet with a crude estimate of over 20,000 acres of available sagebrush, and sagebrush associated shrub habitats. It remains largely snow-free throughout the winter except in the more severe winters, and even then sagebrush stands remain highly available. Additional surveys are planned for next winter.

Similar stands of available sagebrush habitats are found along the lower slopes the eastern side of the White Mountains from Deep Springs Valley north to Montgomery Pass between 5,500 and 7,000 feet. The Inyo National Forest is currently surveying for the presence of sage-grouse or sign of previous use.

6.2.4 Habitat Condition

The Nevada Sage-grouse Conservation Strategy defined five different habitat condition categories which are Given in Appendix B. In the White Mountain PMU, Esmeralda County, Nevada has approximately 4,700 acres characterized as R-3, approximately 56,000 acres as R-2, and approximately 13,000 acres as R-0. Mineral County, Mono and Inyo Counties_____

6.3 Sage-grouse Populations

6.3.1 Historical Distribution

Esmeralda County—Very little historic sage-grouse data exist for Esmeralda County. Information that does exist consists of harvest data, limited brood survey data, and various verbal reports received over the years from locals and sportsmen. This information indicates that sage-grouse densities have always been relatively low in Esmeralda County, and that the majority of sage-grouse occur along the east side of the White Mountains in the western portion of the county. The fact that sage-grouse were not abundant in Esmeralda County made the area a low priority for survey efforts in the past, which in turn has resulted in a lack of general knowledge about this population.

Anecdotal evidence, in the form of verbal sighting reports from sportsmen, locals, and others, suggests that sage-grouse historically occurred in low densities in the Magruder Mountain/Upper Tule Canyon area of southern Esmeralda County, Nevada. The latest, unverified report of a sage-grouse sighting in this area occurred in 1998. Anecdotal evidence also suggests that sage-grouse historically occurred in the Silver Peak Range although no sightings have been reported in many years.

Information gathered from 10 percent hunter harvest questionnaire data between 1960 and 1998 shows that the average annual sage-grouse harvest in Esmeralda County was 5.5 birds by an average of 5 hunters during 36 open seasons. Sage-grouse hunting in Esmeralda County was discontinued beginning in 1999.

A limited amount of brood survey data were gathered in 1972, 1975,1976, 1988, 1989, 1991, 1992, and 2001 for Esmeralda County (See Table 6-2). Brood survey efforts appear to have been limited exclusively to the eastern bench of the White Mountains. An average of 15.8 sage-grouse were observed during these surveys. The total number of birds observed during individual surveys likely reflects differences in survey effort and not relative abundance of sage-grouse in the area. The average brood size observed during these survey efforts was 3.3. Average brood size ranges from a high of 5 in 1976 to a low of 2 in 1989. The number of chicks per hen observed during brood survey efforts ranges from a high of 5 chicks per hen in 1976 to a low of 0.6 chicks per hen in 2001. The combined average for all surveys equals 2.7 chicks per hen. The small sample sizes obtained during surveys in Esmeralda County increases the likelihood of data being biased.

Table 6-2. Esmeralda County sage-grouse brood survey counts 1972-2001.

BIRDS OBSERVED	1972	1975	1976	1988	1989	1991	1992	2001
Cocks	11	0	0	0	3	0	0	0
Hens	4	1	1	5	13	2	5	8
Young	7	3	5	16	16	9	10	5
Total (includes unclassified)	22	4	6	23	36	11	15	13
Young/Hen	1.8	3.0	5.0	3.2	1.2	4.5	2.0	0.6
Average Brood Size	3.5	3.0	5.0	3.2	2.0	4.5	2.5	2.5

Mineral County—Anecdotal evidence, in the form of verbal sighting reports from sportsmen, locals, and others, suggests that sage-grouse historically occurred in the Truman Meadows and McBride Flats areas of southern Mineral County, Nevada. Historical observations also suggest the occurrence of low densities of sage-grouse in the Miller Mountain and Candelaria hills areas of Mineral County, Nevada.

Mono and Inyo Counties—In 1966 the Inyo National Forest evaluated the status of sage-grouse in the White Mountains in the "Sage-grouse Habitat Management Plan." The Plan noted four grouse population artificial subdivisions in the Whites with subjective statements of abundance as follows: Sage Hen Flat in Esmeralda County (light population density), Pellisier and Chiatovich Flats in Mono and Esmeralda Counties (medium density), Perry Aiken Flat in Mono County (light density), and Tres Plumas and Crooked Creek (medium density). Historical reports from 1865 to 1900 stated that grouse were extremely abundant throughout eastern California and the distribution at that time extended south from Inyo County to Independence, probably along the Sierra Nevada foothills. The plan provided no other information about grouse in the White Mountains.

6.3.2 Current Distribution

Esmeralda County—Currently, sage-grouse are known to occur primarily in and along the White Mountains in western Esmeralda County. Recent discovery of sage-grouse droppings in the Volcanic Hills indicates this area receives seasonal use in some years.

In April of 2001 and 2002, NDOW conducted aerial surveys for sage-grouse. They observed in the 2001 survey five (5) sage-grouse classified as follows: one (1) male (not strutting), one (1) female, and three (3) unclassified. Although all observations were of single birds, all were made in the same general area surrounding the lower end of Trail Canyon. Therefore, the grouse may strut in the area, particularly when heavy snow accumulations or severe weather make higher elevation areas of the White Mountains unsuitable for breeding activity.

During the 2002 survey NDOW observed a single hen in the Chiatovich Flats area. The area surrounding Trail Canyon was flown based on the results of the 2001 survey, but no other sage-grouse were observed. During 2002, lack of snow accumulations at higher elevation areas in the White Mountains may have influenced where sage-grouse carried out breeding activity.

Recent sightings of sage-grouse in Esmeralda County have all occurred in, and along the east bench of, the White Mountains (See Map 3). Due to a lack of sufficient data, it is presently impossible to make a reasonable estimate of the sage-grouse population in Esmeralda County.

During a sage-grouse trapping effort conducted in the spring of 2001, a female sage-grouse was captured in the Trail Canyon area of Esmeralda County. Feathers were removed from the hen and sent to the University of Denver for genetic testing. Further information on genetic study is given in section 2.3.

In the spring of 2001, NDOW trapped sage-grouse in the Chiatovich Creek area in Esmeralda County to put radio collars on sage-grouse. They caught only one (1) adult hen just south of Trail Canyon along the east bench of the White Mountains on May 22nd. The hen was on a nest incubating a clutch of eight (8) eggs. On May 29th the hen was still on the nest. On June 8th she was in the company of five (5) other adult hens approximately 0.5 miles southeast of the nest site. Further investigation showed a coyote had destroyed her nest and eaten the eggs. Several unsuccessful attempts were made to locate the hen throughout the remainder of June. In July an aerial telemetry follow-up successfully located the hen in the Chiatovich Flats area of the White Mountains at approximately 10,000 feet in elevation. The hen had traveled into California approximately eleven (11) airline miles southeast of the last known location. The hen remained in the Chiatovich Flats area through August. Many unsuccessful attempts were made to locate the hen until May 2002, at which time the search was abandoned.

Mineral County—Presently, no data exist on which to base current sage-grouse distribution in southern Mineral County, Nevada. Although suitable habitat exists, no recent sage-grouse sightings have been reported in the area. No genetic studies have been carried out in Mineral County.

Mono and Inyo County—Limited survey data are available for grouse in Mono County largely from a CDFG helicopter flight, Deep Springs College wrangler observations, Crooked Creek Research Station observations, and USFS personnel observations. During a survey flight in the early 1990s, CDFG identified three historic leks in the Crooked Creek watershed near Bucks Peak and Red Peak. A survey in 2002 by USFS personnel attempted to locate the leks post strutting. USFS found abundant sage-grouse scat at the Bucks Peak site and Sage Hen site, which suggests leks are still present. In addition two nests and a number of night roost locations were identified in that same area. Observations over the last decade indicate grouse are easily flushed in the Crooked Creek watershed and in the Chiatovich Flat area.

The consensus of agency biologists working in the White Mountains is that a "good" population of birds exists in these areas. A recent observation of over 20 grouse occurred on December 15, 2002 on the south side of Black Mountain in Inyo County at 7,200 feet 1.75 miles west northwest of Tollhouse Springs. Some birds may be flying substantial distances from their summer range to access suitable winter habitat.

Movement-Migration Within And Between PMU's—Insufficient data exist on which to base migration patterns and times within the White Mountain PMU. Anecdotal evidence gathered from sportsmen and locals suggests that sage-grouse occurring along the eastern White Mountains spend the summer in high elevation meadows within that mountain range, primarily in the California portion. Recent data gathered from a radio-collared hen support this theory (see Current Distribution).

6.3.3 Breeding Season

Peterson (1980) suggests that eggs are laid three to 14 days after copulation, and are incubated by the female for 25 to 28 days. Based upon these time frames and limited field data, we believe the sage-grouse breeding/nesting season within the White Mountain PMU occurs from mid/late March to late May. The data include an observation of a nesting hen incubating a clutch of eggs as late as May 29, 2001, and the observation of a hen with a brood as early as May 27,1999, both in the Chiatovich Creek/Trail Canyon area of Esmeralda County, Nevada.

Two nests were found in the Crooked Creek watershed, Mono County on the east slope of Bucks Peak in 2002. Both nests were at 10,320 feet approximately 0.2 mile apart. A hen was incubating on one nest on May 23rd and in a follow-up visit on June 6th both nests had only eggshells.

6.3.4 Food Habits

Presently, no evidence exists to suggest that food habits of sage-grouse occurring within White Mountain PMU differ from typical sage-grouse food habits. In 1950-51 the CDFG conducted a study of Mono County sage-grouse food habits. It examined the stomach contents of 135 sage-grouse killed during the hunting season in September. Leafage, fruits, and flowers and seeds from 31 different plants were identified. Sagebrush was in 91% of the samples and made up 64% of the volume. Clover, rush, snowberry, dandelions, cottonthorn, rabbitbrush and grass accounted for 31% of the volume.

6.4 White Mountains PMU Risk Assessment and Conservation Actions

Threats to sage-grouse populations and habitats are presented below. Threats have been rated as Low (1), Moderate (2), or High (3). Each threat has a conservation strategy to mitigate the threats.

Population Risks

6.4.1 Predation (1)

Although both avian and terrestrial predators exist in the planning area, their impacts on sage-grouse populations within the White Mountain PMU are unknown. Nesting habitat quality may directly influence nest predation rates, and the effects of predation on population dynamics cannot be understood until habitat quality is at "optimum" (_____[Cite]). Sage-grouse

nests have been located in Esmeralda County in habitat types that will never meet "optimum" nesting habitat requirements due to natural limitations. In these areas, the only effective method to reduce predation rates may be direct control of predators. Further studies would be necessary before any predator control efforts were undertaken.

6.4.2 Disease/Pesticides (2)

Disease—While we know very little about disease in sage-grouse, any epidemic that might occur can substantially reduce or extirpate local populations.

Pesticides and Herbicides—Pesticides and herbicides are not generally used in this area as the human population and agriculture are limited. But accidental exposure to pesticides and herbicides can kill grouse, especially if they are sprayed directly with toxic agents.

6.4.3 Hunting/Poaching (1)

Poaching of sage-grouse is considered a low risk to populations within the White Mountain PMU, though it probably occurs.

6.4.4 Cycles/Populations (3)

Natural Cycles - Due to the naturally low population of sage-grouse occurring within the Esmeralda County portion of the White Mountain PMU, it is possible that a natural emigration of sage-grouse could reduce that population.

Lack of Knowledge - Due to the historically low numbers of sage-grouse occurring in Esmeralda County, this area has been a low priority for data gathering efforts in the past. Very little is known about the sage-grouse population ecology of this population.

Conservation Action: Identify Occupied Seasonal Sage-grouse Ranges Through Radio Telemetry And Other Field Investigations

Risk: Insufficient information concerning location, extent, and condition of occupied seasonal sage-grouse ranges makes proper management of sage-grouse and sage-grouse habitat difficult.

Objective: Identify and evaluate occupied seasonal sage-grouse ranges within the White Mountain PMU through use of telemetry and field investigations.

Actions:

1. Attempt to place radio collars on a minimum of 10 adult sage-grouse within PMU by 2005.
2. Inform cooperating agencies of collar frequencies and locations to aid in collection of additional data.
3. Develop and use a standard form for recording of telemetry data.
4. Conduct telemetry follow-up a minimum of biweekly.
5. Investigate mortality signals as soon as possible to properly identify causes of mortality.
6. Describe habitat type for all telemetry locations.
7. Evaluate habitat condition in all identified locations.
8. While conducting any field activities observed sage-grouse sign will be recorded and reported to the appropriate state wildlife agency.
9. Map occupied sage-grouse ranges.

10. Create working partnerships with non-governmental organizations, such as Deep Springs College, to assist with data collection. Land management agencies can provide guidance on data needs and formats.

Rationale: Accurately defining all currently occupied seasonal sage-grouse ranges will aid in making proper land and sage-grouse management decisions. Information gathered will also make it possible to more accurately assess population status.

Legal Authority: Population management is under the authority of state wildlife agencies. NDOW will be the project lead in the Nevada portion of the PMU. CDFG will be the project lead in the California portion of the PMU.

Procedural Requirements: At the earliest possible convenience NDOW will contact the land management agency on which trapping and collaring will occur. At that time the necessary level of compliance will be determined regarding federal laws.

Level of Partnership Commitment: The Nevada Department of Wildlife has committed to attempting to place radio collars on a minimum of five (5) adult sage-grouse to aid in identification of occupied sage-grouse ranges in the Esmeralda portion of the White Mountain PMU during 2005. The collars for the project were ordered in December 2003.

Funding Sources: NDOW would fund the Nevada portion of the project. It is recommended that CDFG provide funding for collaring a minimum of 5 sage-grouse on the California portion of the project area.

Implementation Process:

1. Project Planning: NDOW, CDFG
    a. Enter into budget planning.
    b. Cooperatively develop data form.
    c. Cooperatively identify priority areas for capturing and collaring sage-grouse.
2. Project Implementation: NDOW, CDFG
    a. Budget for project.
    b. Acquire telemetry collars.
    c. Conduct trapping effort utilizing most current techniques.
    d. Conduct telemetry follow-ups a minimum of biweekly.
    e. Utilize telemetry data for identifying additional project needs.
3. Project Monitoring: NDOW, CDFG.
    a. CDFG compile and evaluate all telemetry data gathered in California.
    b. NDOW compile and evaluate all telemetry data gathered in Nevada.
    c. Provide annual reports to all cooperating agencies.
    d. Report accomplishment to USFWS, Reno Office.

Conservation Action: Increase Aerial And Ground Lek Surveys

Risk: Lack of knowledge concerning all facets of the White Mountain sage-grouse population increases the likelihood of critical breeding habitat being lost through various means. Lack of knowledge concerning lek sites and sizes of this population also makes determination of population status and trend impossible.

Objective: Locate and monitor active sage-grouse leks within White Mountain PMU.

Actions:

1. Continue aerial searches of Esmeralda and Mineral Counties within the White Mountain PMU by the Nevada Department of Wildlife until it is determined that all active primary leks have been located or that active leks do not exist.
2. Initiate aerial lek searches in Inyo and Mono County portions of White Mountain PMU by California Department of Fish and Game.
3. In addition to aerial searches, NDOW, CDFG, USFS (Inyo) and BLM (Tonopah) will conduct ground searches/surveys. Due to budgetary constraints, it may also be necessary to conduct ground searches/surveys in lieu of aerial surveys in some years.
4. Draw up a BLM as-needed Office of Aviation Services contract for wildlife surveys to assist with limited flight budgets and time constraints.
5. Investigate the use of forward looking infrared (FLIR) technology as a method for locating lek sites, nest sites, and winter habitat.
6. Create working partnerships with non-governmental organizations, such as Deep Springs College, to assist with data collection. Land management agencies can provide guidance on data needs and formats.

Rationale: It is critical that active leks be located and monitored in order to accurately assess population status and to protect these critical breeding habitat areas.

Legal Authority: Wildlife population management is under the authority of state wildlife agencies. Public land management is under the authority of federal land management agencies.

Procedural Requirements**:** BLM. NDOW and CDFG must budget for and schedule flights using their respective policies and procedures.

Level of Partnership Commitment**:** NDOW has conducted aerial lek surveys for the past three years in the Esmeralda County portion of the White Mountain PMU and is committed to continuing survey efforts within the constraints of budgetary and time limitations. If necessary, NDOW will conduct ground surveys annually.

Funding Sources: NDOW sage-grouse survey activities are funded by W64 grant money. Other agencies' funding would come from their annual wildlife budgets, or from special grants as they deem necessary.

Implementation Process:

1. Project Planning: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Compile all existing lek location data for PMU area.
    b. Cooperatively identify priority areas for flights and/or ground searches.
    c. Enter into budget planning.
    d. Schedule surveys
2. Project Implementation: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Budget for surveys
    b. Conduct surveys
    c. Project Monitoring: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    d. NDOW compile and evaluate lek survey data for Nevada portion of PMU.
3. CDFG compile and evaluate lek survey data for California portion of PMU.
    a. Provide written survey narratives to all cooperating agencies.

b. Report accomplishment to USFWS, Reno Office.

Habitat Risks

6.4.5 Marginal/Limited Habitat

Productive sage-grouse habitat is very limited in Esmeralda County. Large portions of the county consist of salt desert and Mojave Desert habitat, which does not support sage-grouse (see section 6.1.4). Much of the sage-grouse habitat in Esmeralda County that does exist occurs along a transition zone where sagebrush habitat and salt desert and/or Mojave Desert habitat intermix. This transition zone is not capable of supporting high densities of sage-grouse.

Conservation Action: Identify Potential Sage-grouse Habitat

Risk: Because of the limited amount of suitable habitat in the White Mountain PMU, any loss of sagebrush habitat may critical to the future of local sage-grouse populations.

Objective 1: Identify all sagebrush habitats that could be occupied by, or is currently suitable for, sage-grouse within the White Mountain PMU.

Actions:

1. Compile, refine, and integrate existing GIS data from BLM and US Forest Service for the PMU.
2. Investigate the use of aerial photo surveys to delineate sagebrush habitats, identify sagebrush islands, look for pinyon-juniper encroachment, and observe any other human caused disturbances that may not be seen from the ground.
3. Conduct ground truthing efforts to verify results of aerial photos and confirm GIS maps.
4. Update GIS layers based on existing aerial photos.
5. Delineate potential sage-grouse habitat while conducting routine fieldwork.

Objective 2: Assess the potential of identified areas to be successfully rehabilitated to suitable sage-grouse habitat.

Actions:

1. Upon identification, rate all potential habitats as R0-R4.
2. Prioritize sites for projects based on project feasibility.
3. Determine project specifics, make project proposal to the appropriate land management agency.

Rationale: A general lack of sagebrush habitat information exists for this portion of the Bi-State planning area. To know the location, condition, and extent of potential habitat is imperative for proper management.

Legal Authority: Federal land management agencies have legal authority over activities and projects occurring on federally managed public lands.

Procedural Requirements: All proposed activities and projects that would occur on public land will be evaluated by the appropriate land management agency through NEPA and other appropriate processes.

Level of Partnership Commitment:

Funding Sources: These activities need to be considered in the budget planning processes of the involved agencies to contract these services out or keep them as part of their internal workload.

Implementation Process:

1. Agencies would plan for the project in their budget planning process.
2. Interested agencies would decide who will be the lead agency for the project.
3. Designate a project coordinator who will be the central contact for the project.
4. Compile and review all existing data.
5. Where data are still needed, investigate means to collect the data, whether it is on the ground or uses technology such as aerial photography.
6. If needed, hire a contractor to take aerial photos.
7. Disseminate data to all interested parties and decide what on the ground projects are needed.

Conservation Action: Implement Habitat Improvement Projects Throughout Occupied Seasonal Sage-grouse Ranges

Risk: Suitable sagebrush habitat is limited within much of the White Mountain PMU. In many areas sagebrush habitat is being lost to Pinyon/Juniper encroachment and degraded in terms of loss of productivity. Loss of good sagebrush habitat threatens the continued existence of sage-grouse in some portions of the PMU.

Objective: Increase quality and availability of suitable sagebrush habitat.

Actions:

1. Design treatments based on individual site potentials using the most current information possible.
2. When necessary, utilize test plot methodology to identify the most effective treatment methods for an area.

Rationale: The limited amount of suitable sage-grouse habitat in some portions of the White Mountain PMU makes it critical that existing areas are not lost and are returned to good quality where necessary. Upon collection of data, these projects can be considered more thoroughly.

Legal Authority**:** Federal land management agencies have legal authority over activities and projects occurring on federally managed public lands.

Procedural Requirements**:** All proposed activities and projects that would occur on public land will be evaluated by the appropriate land management agency.

Level of Partnership Commitment: Land and wildlife management agencies who hold any interest in conserving sage-grouse should be committed to providing staff and funding for appropriate projects. Any nongovernmental or private parties who hold interest in conserving sage-grouse would be identified either through direct contact or in public scoping opportunities.

Funding Sources: The projects that could occur based on the results of data collection would be funded through agency budgets, cooperative programs, challenge cost share grants, or other grants.

Implementation Process:

1. Project Planning: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Compile all existing habitat data for PMU area.
    b. Cooperatively identify priority areas for treatments.
    c. Enter into budget planning.
    d. Schedule treatments.
2. Project Implementation: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Budget for treatments.
    b. Conduct treatments.
3. Project Monitoring: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. NDOW would compile and evaluate treated area data for Nevada portion of PMU.
    b. CDFG would compile and evaluate treated area data for California portion of PMU.
    c. Provide written survey narratives to all cooperating agencies.
    d. Report accomplishment to USFWS, Reno Office.

6.4.6 Water Distribution

Portions of otherwise suitable habitat in Esmeralda County and Truman Meadows lack optimal water distribution, particularly in drier than normal years. As an example, in the Truman Meadows area of Mineral County, Sagehen Spring was dry during much of 2002.

Conservation Action: Spring Development

Risk: Drought occurs frequently in the rain shadow of the White Mountains and could negatively impact sage-grouse populations.

Objective: Evaluate all existing spring developments occurring in potential or occupied sage-grouse habitat within the White Mountain PMU. Repair or modify as necessary, in order to maintain water and riparian vegetation at the source.

Actions:

1. In cooperation with the water rights owners, identify water rights issues and seek authorization to repair and modify existing development.
2. Make repairs and modifications to water developments as necessary.

Rationale: The limited amount of rainfall in the eastern part of the White Mountain PMU, and the decreased amount of natural water sources available, could impact sage-grouse breeding success, use of otherwise good habitat, and interfere with normal travel corridors. Increasing the amount of available water would allow greater distribution of the birds.

Legal Authority: Federal land management agencies can apply for water rights for wildlife use under Nevada state law.

Procedural Requirements**:** All proposed activities and projects that would occur on public land will be evaluated by the appropriate land management agency.

Level of Partnership Commitment: Land and wildlife management agencies who hold any interest in conserving sage-grouse should be committed to providing staff and funding for appropriate projects. Any non government or private parties who hold interest in conserving sage-grouse would make themselves known to agencies either through direct contact or as an interested party in public scoping opportunities.

Funding Sources**:** The projects that could occur based on the results of data collection would be funded through agency budgets, cooperative programs, challenge cost share grants, or other grants.

Implementation Process:

1. Project Planning: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Compile all existing habitat data for PMU area.
    b. Cooperatively identify priority areas for treatments.
    c. Enter into budget planning.
    d. Schedule treatments.
2. Project Implementation: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Budget for treatments.
    b. Conduct treatments.
3. Project Monitoring: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. NDOW would compile and evaluate treated area data for Nevada portion of PMU.
    b. CDFG would compile and evaluate treated area data for California portion of PMU.
    c. Provide written survey narratives to all cooperating agencies.
    d. Report accomplishment to USFWS, Reno Office.

6.4.7 Lack of Diverse Age Structure in Sagebrush

The 2,815 acres of suitable habitat identified on the Inyo National Forest in Trail Canyon and in Kennedy and Sage Hen Flats are almost exclusively mature stands of predominantly mountain big sagebrush and low sagebrush. Stand canopy cover is in excess of 25% on the mountain big sagebrush sites associated with rabbitbrush and bitterbrush, and is greater than 35% on snowberry sites on moister slopes. Therefore, mature stands may have higher canopy cover values than are needed for productive sage-grouse habitat (Connelly et al., 2000).

Initial Conservation Strategy: Assess sagebrush habitat for possible treatment to reduce the cover and density of mature and decadent sagebrush.

6.4.8 Non-Native Weed Invasion

Non-native weeds such as cheatgrass *(Bromus tectorum),* Russian thistle (*Salsola ibericus)* and members of the mustard family are found in low density throughout the White Mountains in sage-grouse habitat. They are usually found in areas of disturbance such as roadsides, parking areas, and trails. They do, however, present a potential management problem. An area of cheatgrass was found in Trail Canyon at 9,200 feet where a recent burn had occurred. Even though cheatgrass does not appear to be a problem, any future burn could increase cheatgrass in an area where it currently appears at very low density.

Conservation Action: Noxious Weed Management

Risk: Noxious weeds can replace native plant communities and riparian areas upon which sage-grouse may depend.
Objective: Review management activities that may contribute to the spread of noxious species to determine if additional management measures are necessary to minimize weed infestations and spread rate.
Actions:

1. As scientific knowledge increases, continually review and update management measures to reduce threat of noxious weed invasion.
2. Conduct a weed assessment of the PMU.

6.4.9 Habitat Fragmentation (2)

Natural Fragmentation of Habitat - Numerous areas of sagebrush habitat exist throughout Esmeralda and Mineral Counties, Nevada, which are isolated by large expanses of salt desert shrub and Mojave desert habitat. The isolated nature of these sagebrush "islands" may reduce their usefulness to sage-grouse.

Pinyon Pine Expansion - In the central and northern White Mountains in Mono and Esmeralda Counties, sage-grouse habitats from 8,000 to 11,000 feet are highly fragmented and interspersed with large woodland areas of pinyon pine at the lower elevations, and limber pine, bristlecone pine, and mountain mahogany in the higher elevations. This mosaic limits the value of any sagebrush stand for sage-grouse because of the woodland edge effect.

Substantial areas of previously open sagebrush habitats may have been converted to pinyon pine and mountain mahogany. The full extent and rate of this expansion is unknown but it is hypothesized that it has adversely affected sage-grouse habitat in these areas. It is unknown, however, if sage-grouse historically utilized these habitats to any significant degree.

Of the 2,815 acres of suitable habitat identified by USFS in 2002, 1,015 acres (36%) had young pinyon pine or mountain mahogany expansion gradually diminishing their value for sage-grouse. Pinyon expansion is a common trend in the White Mountains.

Conservation Action: Pinyon-Juniper Evaluation

Risk: Pinyon-juniper communities are expanding into sagebrush habitats in both upper and lower elevations.

Objective: Compare historical and current pinyon-juniper distribution to determine the amount of encroachment that has occurred.

Action: Based on evaluation results, treat pinyon-juniper and mountain mahogany that have encroached into sagebrush to increase habitat continuity and suitability for sage-grouse use.

Rationale: Expansion of pinyon-juniper communities could impact the limited amount of sage-grouse habitat in the eastern part of the White Mountain PMU.

Legal Authority**:** Federal land management projects are subject to NEPA regulations.

Procedural Requirements: All proposed activities and projects that would occur on public land will be evaluated by the appropriate land management agency.

Level of Partnership Commitment**:** Land and wildlife management agencies that hold any interest in conserving sage-grouse should be committed to providing staff and funding for appropriate projects. Any nongovernmental or private parties who hold interest in conserving sage-grouse would be identified either through direct contact or in public scoping opportunities.

Funding Sources**:** The projects that could occur based on the results of data collection would be funded through agency budgets, cooperative programs, challenge cost share grants, or other grants.

Implementation Process**:**

1. Project Planning: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Compile all existing pinyon juniper site data.
    b. Cooperatively identify priority areas for treatments.
    c. Enter into budget planning.
    d. Schedule treatments.
2. Project Implementation: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Budget for treatments.
    b. Conduct treatments.
3. Project Monitoring: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. NDOW would compile and evaluate treated area data for Nevada portion of PMU.
    b. CDFG would compile and evaluate treated area data for California portion of PMU.
    c. Provide written survey narratives to all cooperating agencies.
    d. Report accomplishment to USFWS, Reno Office.

Unnatural Fragmentation of Habitat - The construction of new fences, roads and transmission lines, for example, may fragment occupied or potential sage-grouse habitat within the limited range of the sage-grouse in the White Mountain PMU. A proposed open pit gold mine below Sage Hen Flat in the White Mountains, if ever constructed, will adversely affect the limited sagebrush habitat in that area.

Conservation Action: Protection Of Existing Seasonal Sage-grouse Ranges

Risk: Fragmentation, destruction, and development of sage-grouse habitat will increase likelihood of a downward population trend due to their dependence on large expanses of sagebrush/bunchgrass habitat types.

Objective: Protect occupied sage-grouse seasonal ranges from fragmentation, destruction, and development.

Action: When possible land management agencies will prohibit activities and projects that may fragment or otherwise negatively impact sage-grouse habitat, where the agencies have discretionary authority.

Rationale: Sage-grouse are often dependent on vast expanses of sagebrush/bunchgrass dominated rangeland. Identification of these ranges and their protection from fragmentation, destruction or development is critical to ensure the continued existence of sage-grouse.

Legal Authority**:** Federal land management agencies have legal authority over activities and projects occurring on federally managed public lands. Within the White Mountain PMU, USFS land is under the legal authority of _____. BLM land _____[?]

Procedural Requirements: All proposed activities and projects that would occur on public land will be evaluated by the appropriate land management agency through the _____ process.

Level of Partnership Commitment**:**

Funding Sources**:**

Implementation Process**:**

1. The agencies would cooperate to conduct a thorough review of all sage-grouse Information on a case by case basis for proposed projects.
2. Do not allow management actions to adversely affect sage-grouse habitat.

6.4.10 Changing Land Uses (2)

Mining and Minerals Exploration - The Inyo National Forest has received requests to conduct mineral exploration drilling in occupied sage-grouse habitat. Construction of drill roads, pads, etc. will cause a direct loss of habitat.

Conservation Action: Mining And Minerals Exploration

Risk: Sagebrush habitat is severely limited in portions of the White Mountain PMU, and mining and mineral exploration cause direct loss of habitat.

Objective: Preclude or minimize habitat loss due to mining and mineral exploration.

Actions:

1. Delineate critical sage-grouse habitat for possible withdrawal from mineral entry.
2. Use telemetry studies and all other available data to identify critical sage-grouse habitat.
3. Withdraw lands that are determined to be critical sage-grouse habitat from mineral entry where necessary and possible
4. Mitigate authorized mining and mineral exploration impacts to sage-grouse habitats, including unoccupied sagebrush habitats.

Rationale: Mineral exploration activities would cause a direct loss of currently occupied and potential habitat.

Legal Authority: The sage-grouse is a Nevada BLM sensitive species and any potential impacts to the species imposed by a project need to be evaluated to preclude endangerment of the species.

Procedural Requirements**:** All proposed activities and projects that would occur on public land would be evaluated by the appropriate land management agency.

Level of Partnership Commitment**:** Land and wildlife management agencies that hold any interest in conserving sage-grouse should be committed to providing staff and funding for appropriate projects. Any non government or private parties who hold interest in conserving

sage-grouse would be identified either through direct contact or in public scoping opportunities.

Funding Sources**:** The projects that could occur based on the results of data collection would be funded through agency budgets, cooperative programs, challenge cost share grants, or other grants.

Implementation Process:

1. Project Planning: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Evaluate proposed mining related projects for adverse impacts to sage-grouse habitat.
2. Project Implementation: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. During project review determine mitigation measures for the proposed action.
    b. Implement the mitigation measures.
3. Project Monitoring: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Adverse impacts to sage-grouse habitat will manifest in the form of localized sage-grouse population declines. Sage-grouse population monitoring will be the responsibility of NDOW and CDFG.

Alternative Energy Sources - An increased interest in geothermal and wind generated energy sources has occurred in this area. Projects of this type have the potential to disrupt large areas of sage-grouse habitat.

Agriculture/Ground Water Pumping - Excessive water-intensive agricultural development, for example, center pivot irrigation, affects the groundwater table and riparian areas of the hydrologic zone.

6.4.11 Livestock Grazing/Wild Horses, Burros (2)

Inappropriate grazing levels and/or seasons of use can negatively impact sage-grouse/sagebrush, and riparian habitats. Livestock grazing management was observed to be adversely impacting riparian habitats in Chiatovich, Middle and Trail Canyons in 2002. The recent successive years of drought coupled with trailing and forage utilization impacts may be adversely affecting sage-grouse habitats.

Substantial trailing was observed in Trail Canyon in 2002 on slopes and ridgelines, which may suggest the herbaceous component of the sagebrush stands was being impacted. Wild horses and/or burros may negatively impact sage-grouse/sagebrush and riparian habitats by excessive use if their populations are not managed appropriately.

Conservation Action: Livestock Grazing Management

Risk: Livestock that are grazing in sage-grouse habitat during breeding and nesting periods may negatively impact breeding and nesting success of the sage-grouse.

Objective: Manage sagebrush ecosystems for maximum site potentials in accordance with WAFWA guidelines or locally approved standards.

Actions:

1. Identify ecologic site potential for all key habitats and establish appropriate management standards.

2. Work with federal range lessees and willing private landowners to adjust seasons of use, if necessary.
3. Provide incentives for livestock managers to alter their seasons of use, if necessary, to accommodate sage-grouse breeding and nesting seasons.

Rationale: If cattle are impacting breeding and nesting success, then simple management adjustments may be made to accommodate the breeding and nesting seasons of the sage-grouse.

Legal Authority: Federal land management agencies follow grazing regulations delineated in CFR 43 Group 4100.

Procedural Requirements: All proposed activities and projects that would occur on public land will be evaluated by the appropriate land management agency.

Level of Partnership Commitment: Land and wildlife management agencies that hold any interest in conserving sage-grouse should be committed to providing staff and funding for appropriate projects. Any nongovernmental or private parties who hold interest in conserving sage-grouse would be identified either through direct contact or public scoping opportunities.

Funding Sources:

Implementation Process:

1. Project Planning: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Compile all existing habitat data for PMU area.
    b. USFS and BLM discuss with their lessees options both sides see as feasible.
2. Project Implementation: USFS (Inyo), BLM (Tonopah)
    a. Federal agencies can offer grazing agreements to lessees that accommodate sage-grouse needs to be completed as a decision.
3. Project Monitoring: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. NDOW would compile and evaluate treated area data for Nevada portion of PMU.
    b. CDFG would compile and evaluate treated area data for California portion of PMU.
    c. Provide written survey narratives to all cooperating agencies.
    d. Report accomplishment to USFWS, Reno Office.

Conservation Action: Wild Horse Management

Risk: Improper management of wild horses may result in degradation of sage-grouse habitat.

Objectives:

1. Ensure appropriate management levels (AML) in existing herd management areas (HMAs) and wild horse territories (WHTs) where sage-grouse occur are such that wild horses do not negatively impact sage-grouse habitat.

2. Do not allow wild horse populations to exceed AML in existing HMAs and WHTs.

Actions:

1. Conduct a wild horse gather for those horses outside of existing HMAs and WHTs.
2. Conduct aerial censuses in HMAs where sage-grouse are known to occur to determine wild horse population levels.
3. Conduct wild horse gathers if populations are over AML.
4. If it is determined that sage-grouse habitat is being negatively impacted by wild horses within an HMA or WHT, appropriate action will be taken by the appropriate land management agency to adjust the AML.

Rationale: Keeping wild horse populations at or below AML within existing HMAs and WHTs will limit their impact on sage-grouse habitat. Subsequently adjusting AML as needed should address any residual impacts.

Legal Authority: This project would include interagency cooperation between the Bureau of Land Management and the US Forest Service.

Procedural Requirements: NEPA would have to be conducted for this project by the US Forest Service and/or BLM.

Funding Source: Funding for this project would be the responsibility of the BLM and US Forest Service.

Implementation Process:

1. Project Planning: BLM and USFS
    a. Request funds to conduct aerial census to determine population numbers, distribution, and range condition.
2. Project Implementation: BLM and USFS
    a. Conduct aerial census of project area or HMA.
    b. If numbers are close to AML or over AML, request to be placed on the gather schedule.
    c. Gather wild horses to appropriate levels.
3. Project Monitoring: BLM and USFS
    a. Monitor area for population growth, any resource damage, and sage-grouse presence.

6.4.12 Fire Ecology (1)

In general, Esmeralda County does not experience very many wildland fires, therefore, fires are considered a low risk for the sage-grouse population.

6.4.13 Human Disturbance (1)

Disturbance such as residential development is very low in the White Mountain PMU. The major type of disturbance in the area is recreational use, such as fishing, off-road vehicles, and camping.

Conservation Action: Minimize Human Disturbance (Recreation, Roads, Fences)

Risk: Many types of human disturbance such as recreation, road construction, and fences can potentially negatively impact sage-grouse populations or habitat.

Objective 1: Minimize recreation impacts to existing sage-grouse activities and habitat.

Actions:

1. Evaluate areas for seasonal closures to known sage-grouse use areas during strutting and nesting seasons between February and May.
2. Where land and wildlife management agencies have discretionary authority and determine it to be prudent and necessary, areas of critical sage-grouse habitat will be seasonally closed to recreational use.

Objective 2: Minimize impacts due to new road construction or creation.

Action: Where land management agencies have discretionary authority, no new two-track or bladed roads will be allowed in sage-grouse habitat.

Objective 3: Minimize impacts to sage-grouse from fences as perch sites for avian predators.

Actions:

1. Land management agencies will identify all fences occurring within known occupied or potential sage-grouse habitat.
2. By 2005, determine if any fences near known occupied or potential sage-grouse habitat contribute to sage-grouse mortality directly or by providing perch sites for avian predators.
3. When and where necessary, land management agencies will modify fences with Nixalite or other similar devices to make them less predator friendly and reduce mortality potential.
4. Any new fence construction will be made grouse friendly.

Rationale: Human caused disturbances may be interfering with breeding and nesting success of sage-grouse. New road development and OHV use may degrade existing or potential habitats. Fences may contribute to sage-grouse mortality directly or indirectly. These actions will minimize these risks within the authority of regulatory agencies.

Legal Authority: Federal land management agencies work under the authority of CFR.

Procedural Requirements: All proposed activities and projects that would occur on public land will be evaluated by the appropriate land management agency.

Level of Partnership Commitment**:** Land and wildlife management agencies who hold any interest in conserving sage-grouse should be committed to providing staff and funding for appropriate projects. Any nongovernmental or private parties who hold interest in conserving sage-grouse would be identified through direct contact or public scoping opportunities.

Funding Sources: The projects that could occur based on the results of data collection would be funded through agency budgets, cooperative programs, challenge cost share grants, or other grants.

Implementation Process:

1. Project Planning: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Compile all existing habitat data for PMU area.
    b. Cooperatively identify priority areas.
    c. Enter into budget planning.
    d. Schedule plans and events.

2. Project Implementation: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. Budget for plans and events.
    b. Conduct treatments.
3. Project Monitoring: NDOW, CDFG, USFS (Inyo), BLM (Tonopah)
    a. NDOW would compile and evaluate treated area data for Nevada portion of PMU.
    b. CDFG would compile and evaluate treated area data for California portion of PMU.
    c. Provide written survey narratives to all cooperating agencies.
    d. Report accomplishment to USFWS, Reno Office.

6.4.14 Climate/Weather (2)

All limited populations are at risk to stochastic events, whether they are caused by the weather or disease or any other reason. Any weather event that might cause mortalities in sage-grouse is a risk to the population. The most probable weather events would be extreme hot or cold spells or a blizzard. Drought can also affect this population.

7.0 MOUNT GRANT PMU

7.1 PMU Description

7.1.1 Physical Location And Boundary

The Mount Grant PMU is approximately 699,079 acres in size and occurs entirely within Lyon and Mineral Counties, Nevada. The boundary encompasses the Wassuk Mountain Range and a portion of the Excelsior Mountains. The northeast boundary of the PMU is Walker Lake. The southeastern boundary passes the town of Hawthorne, Nevada and runs south toward Whiskey Flat, and on to Huntoon Valley. From the Nevada/California state line, the boundary follows the state line to the East Walker River, following the river to the Cambridge Hills, north to Highway Alt. 95, and on to Walker Lake. There are no towns within the boundary of the PMU.

7.1.2 Land Ownership And Regulatory Jurisdictions

Land ownership within the Mount Grant PMU is primarily under federal management, as shown in Table 7-1. Approximately 43 percent of the PMU is National Forest land managed by the Humboldt-Toiyabe National Forest, Bridgeport Ranger District. The BLM Carson Field Office manages an additional 40 percent of the PMU as public land. The remainder of the PMU is 7 percent military land under jurisdiction of the Department of Defense; 6 percent private land; and 4 percent Walker River Paiute Tribal Land.

Table 7-1. Land ownership in the Mount Grant PMU.

LAND MANAGER OR OWNER	ACRES	PERCENT OF PMU
National Forest	300,910	43
Bureau of Land Management	279,916	40
Private	41,945	6
Department of Defense Hawthorne Army Depot	48,936	7
Walker River Paiute Tribe	27,963	4
State and County Land	unknown	>1
Total Acres	699,079	100

Herd Management Areas and Territories - Three wild horse herds occupy the Mount Grant PMU: the Wassuk HMA, Powell Mountain Wild Horse and Burro Territory and Montgomery Pass Wild Horse Territory (Table 7.2). Only a small portion of the Montgomery Pass Territory is found in the Mt. Grant PMU.

Table 7-2. Powell Mountain Wild Horse and Burro Territories

HORSE TERRITORY	AUM	ACRES	APPROPRIATE MANAGEMENT LEVEL	RESPONSIBLE AGENCY
Powell Mountain Wild Horse and Burro	435	132,800	29	USFS – Humboldt-Toiyabe
Wassuk Wild Horse and Burro	72	24,954	109-165	BLM - Carson
Montgomery Pass		1,570	184	USFS – Inyo BLM- Bishop and Carson

There are ten livestock grazing allotments present on lands administered by the US Forest Service, Bridgeport Ranger Station and _____ allotments administered by the Bureau of Land Management, Carson District Office.

Table 7-3. Domestic livestock grazing allotments managed by the USFS Bridgeport Ranger District in the Mount Grant PMU

ALLOTMENT	SAGE-GROUSE SEASONAL HABITAT	CLASS OF LIVESTOCK	NUMBERS	SEASON OF LIVESTOCK USE
East Walker C&H*	TBC*	Cattle	452	12/1-3/31
Huntoon C&H*	TBC	Cattle	165	11/16-4/15
Larkin Lake C&H	TBC	Cattle	446	11/1-11/30
Masonic C&H*	TBC	Cattle	80	7/1-10/15
Nine Mile C&H*	TBC	Cattle	1076	4/1-5/31
Nine Mile C&H*	TBC	Cattle	102	10/1-11/30
Powell Mountain C&H	TBC	Cattle	151	6/1-10/15
Rough Creek C&H	TBC	Cattle	33	6/1-10/15
Whiskey Flat C&H	TBC	Cattle	203	11/1-4/15
Wildhorse C&H	TBC	Cattle	50	12/1-5/31

* To be completed.

7.1.3 Topography And Climate

Elevations within the PMU range from 1,250m (4,100 feet) to 3,609m (11,230 feet). Approximately one-third of the PMU is characterized as steep slopes, ranging between 10 and 35 percent. The remaining area consists of gentle slopes and flats. The predominant aspects are east, and west. The highest peak is Mount Grant at 3,426m (11,239 feet) in the Wassuk Mountains. Other dominant mountain peaks include Mount Moho in the Excelsior Mountains at 2,684 m (8,805 feet, and Aurora Peak at 2,667 m (8,750 feet).

7.1.4 Vegetation Communities and Distribution

The vegetation in the Mount Grant PMU varies from salt desert shrub at the lower elevations of the Wassuk Mountains to alpine vegetation on the highest peaks.

Salt Desert Shrub: The salt desert shrub communities include shadscale *(Atriplex confertifolia)*, Baily greasewood *(Sarcobatus baileyi)*, bud sagebrush *(Artemisia spinescens)*, winterfat (*Krascheninnivovia lanata*), Indian ricegrass *(Achnatherum hymenoides)*, bottlebrush squirreltail *(Elymus elymoides*), and lupine *(Lupinus spp.)*. Annual precipitation is 5-8".

Sagebrush: Sagebrush sites are found on slightly higher elevations with an increase in precipitation. Wyoming big sagebrush *(Artemisia tridentata wyomingensis)* occupies the deeper soils and Lahontan sagebrush (*A. arbuscula longicaulis*) is the dominant shrub species on the shallow soils. Wyoming big sagebrush is generally found on soils that are shallow, gravelly to stony, with low water holding capacity. Annual precipitation varies from 8-12 inches. Other associated species on these sites are Anderson peachbrush *(Prunus andersonii)*, Mormon tea *(Ephedra spp.*), antelope bitterbrush *(Purshia tridentata)*, Standberry cliffrose (*P. stansburiana*), Thurber needlegrass *(Achnatherum thurberianum*), desert needlegrass *(A. speciosa),* phlox *(Phlox spp.)*, biscuit root *(Lomatium spp.)* and lupine (Lupinus spp.).

Above 6,000 feet in elevation, Lahontan sagebrush transitions into low sagebrush site *(A. arbuscula)* on the shallow soils. Low sagebrush grows on dry, sterile, rocky, often alkaline soils that range from shallow to moderately deep. Hardpans at 10-15 inches depth are not uncommon and they create a condition of saturated soil for a considerable period in the spring. Annual precipitation varies from 7-18 inches.

Mountain big sagebrush *(A. tridentata vaseyana)* is the dominant shrub on deeper, mesic soils generally found at higher elevations from the foothills to timberline. Annual precipitation varies from 10-20 inches. Soils are generally deep, with good water holding capacity.

Basin big sagebrush (*A. tridentata ssp. tridentata*) is found on well drained, deep soils on plains, in valleys, canyon bottoms, and foothills in 9-16 inch precipitation zones, frequently associated with drainages. Associated species on these sites include antelope bitterbrush, snowberry *(Symphoricarpos sp.)* currant *(Ribes sp.)*, spike fescue (*Festuca kingii*), mountain brome *(Bromus marginatus)*, bluegrass *(Poa sp.)*, Idaho fescue *(F. idahoensis)*, and needlegrass species. A few of the forbs found include mule's ear *(Wyethia sp.)*, balsamroot *(Balsamorhiza sp.)*, phlox and lupine.

Silver sagebrush (*Artemisia cana) occurs i*n the more mesic soils with a seasonal high water table. Shrub species associated with these sites include snowberry *(Symphoricarpos sp*.), elderberry (*Sambucus spp*.), silver buffaloberry (*Shepheria spp*.), currant *(Ribes sp*), chokecherry (*Prunus virginiana*), woods rose (*Rosa spp*.) and willow *(Salix sp).* The herbaceous species can include sedges *(Carex sp.)*, bluegrass, lupine, clovers *(Trifolium sp),* wild iris *(Iris sp),* rushes *(Juncus sp), and* dandelion (*Taraxacum sp).*

On very rocky sites, sagebrush is replaced by mountain mahogany *(Cercocarpus ledifolius)* stands.

Woodlands - Woodlands found in the PMU include pinyon pine *(Pinus monophylla)* and Utah juniper *(Juniperus osteosperma)* at elevations up to 8,000 feet with annual precipitation of 10-16 inches. The pinyon/juniper exceeds its historical distribution and density in the area. This especially is the case at the lower and mid elevation where the woodlands encroach into the sagebrush communities. This expansion and an increase in the stand density has resulted in a reduction of the understory component. Erosion rate has been accelerated due to lack of understory. Fire frequency may also be less than reference conditions due to a reduction of the fine fuel that once carried the fires.

Sub alpine and Alpine Zone - Limber pine (*Pinus flexilis*) can be found on mountain summits and side-slopes at 9,000 to 10,000 feet elevation. The subalpine zone, from 10,000 feet to the top of Mount Grant, receives 16-20 inches annual precipitation and is characterized by wax currant (*R. cereum*), Douglas rabbitbrush (*Chrysothamus viscidiflorus*), prickly gillia (*Leptodactylon spp*.) and hairy goldenaster (*Heterotheca villosa var.villosa*). Common grasses include skyline and timberline bluegrasses (P. and *P. rupicola*), prairie junegrass (*Koleria macrantha*), alpine fescue (*F. brachyphylla*), mat muhly (*Muhlenbergia richardsonis*), rushes (*Juncus sp),* and Ross and dunhead sedges (*Carex rossii* and *C. phaeocephala*).

Riparian Zones - Streams, wet meadows, dry meadows, springs and seeps are interspersed throughout the PMU. Vegetation associated with these areas includes aspen (*Populus tremuloides*), willows *(Salix sp)* and cottonwoods *(Populus sp).* Similar habitats include irrigated pastures and hay fields.

7.2 Sage-grouse Habitat Description and Condition Assessment.

The Mount Grant PMU includes a good distribution of seasonal ranges for sage-grouse. Overall, sagebrush habitats within the Mount Grant PMU are considered to be in good condition relative to the WAFWA guidelines. The most critical limiting factor to sage-grouse populations is the availability of water.

Habitat in the Mt. Grant PMU Complex is a mixture of mountain big sagebrush, Wyoming sagebrush, low sagebrush and a mixture of bitterbrush, service berry and desert peach. with encroaching pinyon/juniper trees. Habitat has been assessed as RO, R1, R2, R3 and RO (agriculture).

Research is needed to further define the parameters of this population of grouse in order to develop corrective measures to help the population stabilize and increase to somewhere near levels prior to the recent decline.

7.2.1 Breeding Habitat

Sage-grouse leks in the Mt. Grant PMU are from 6,500 feet in the Nine Mile area to 8,800 feet in the Aurora and Mt. Grant areas; these are precluded from motor vehicle access.

Overall the sagebrush communities in this PMU are good. The Mt. Hicks area is an example of this. The lower areas of China Camp and the Aurora area have lower quality sagebrush habitat.

The *North Leks* consist of several individual leks (primary and satellite?) on a ridge overlooking Lapon Meadows, documented in a 1993 helicopter survey. Approximately 30 birds were observed on this ridge during a 2001 helicopter survey. The ridge is probably bare of snow in all but the heaviest snowfall years. There is some speculation that in years when this lek is covered with deep snow, the Baldwin Canyon lek is used as an alternative site. These leks are adjacent to ideal nesting habitat.

7.2.2 Summer / Late Brood Habitat

The quantity of meadow habitat is not limiting in the Mount Grant PMU. Most of the year round habitat for sage-grouse within the Mount Grant PMU is considered to be in fair to good condition with the exception of adequate brood rearing sites. Brood meadows mostly occur between 8,000 and 9,000 feet, with short growing seasons. The alfalfa pivot on the Nine-Mile Ranch provides summer brood habitat for sage-grouse.

The Flying M ranch is in the process of establishing a new pivot sprinkler system to the east of the present pivot sprinkler system. This is an effort to establish an additional pasture feeding process similar to the existing system. The irrigation pivot is intended to produce a hay pasture system to produce what is commonly known as pasture hay. This involves the production of common grasses and forbs and is harvested once or twice a season to produce a baled hay product that is intended to feed livestock during the winter period. Part of this process is intended to provide feed for cattle during the growth period of this pasture. This type of habitat manipulation is thought to provide a benefit for mid to late brood rearing for sage-grouse. The pasture system will provide important forbs and insect production necessary to juvenile sage-grouse survival.

Of most concern are the poor quality riparian zones southeast of the Aurora Mine. The condition of the Aurora Meadows is in a downward trend due to a suspected drop in the water table. This could be attributed to impacts from mining, and a Forest road that traverses the meadow.

7.2.3 Winter Habitat

Within winter areas there has to be an abundance of available sagebrush for food and cover. When snow covers the upper elevations within the Mount Grant PMU, the Nine Mile Flat and Elbow regions become important winter use areas for sage-grouse.

7.3 Sage-grouse Populations

7.3.1 Historical Distribution

Historic records indicate that there has never been a large population of sage-grouse throughout this unit. Mount Grant has had higher bird populations in the past. Since

hunting has been curtailed for the last five years, it is difficult to determine population status on Mount Grant.

7.3.2 Current Distribution

The 2002 sage-grouse population for the Nevada portion of the Mount Grant PMU was estimated to be between 210 and 280 birds. This estimate was produced using a population estimator created by the technical committee of the Western States Sage-grouse Team. A three-year average of the observations from 2000, 2001, and 2002 was used. An updated estimate produced using 2003 data gives a low estimate of 358 and a high estimate of 249.

These estimate may be low since the Mount Grant strutting grounds have not been monitored consistently over the years due to the inaccessibility of these areas. It is probable that the total population for the Mount Grant PMU is two to three times the estimates given above.

The population from the Nine Mile Flat portion of this PMU has declined over the years, with the decline attributed mainly to the mining activities around the Aurora Complex and past livestock operations. Of the five general lek locations, two have remained active over the past several years.

Trend. Monitoring of the strutting grounds for this population has been irregular over the years. Lek attendance monitoring began in 1969. These leks were monitored annually for the next eight years. There was no census during the following eleven years. The record indicates that strutting activity was recorded for 1988, 1989 and 1991 with no subsequent observations until 1999. Censuses have been conducted annually since then.

The peak number of strutting males observed occurred in 1972 when a total of 65 were recorded. The average for the period of 1969 to 1970 was 18 strutting males. The next two decades saw the average increase to 31 and 32 strutting males, based on six years of data for 1971-1980, and only two years for the 1980s. The average for the 1991-2000 decade decreased to 12 strutting males, based on three years of observations. The average number of strutting males in 2002 was 24, in 2003 was 46 (a new lek was located), and in 2004 was 48 including the new lek. The long-term average over the 34-year period since 1969 is 24. This population seems to be stable at a reduced level compared to the all-time high count.

Summer brood counts for this PMU are extracted from the Mount Grant area or more specifically the Lapon Meadows Complex. Data are unavailable for the area surrounding Nine Mile Flat.

During the 1960s, brood counts were very low. This could be an artifact of low effort at that time. The 1970s showed increases in sample size and the number of chicks per hen. Average sample sizes rose from 33 for the 1960s to 83 in the 1970s. In the 1980s, the average sample size rose to 140 birds and 38 chicks per 100 hens. During the 1990s a decline in the average sample size to 84 total birds and 22 chicks per 100 hens was recorded. During 2001 and 2002, the total number of birds observed declined to an average of 32 birds and 7 chicks per 100 hens. These data suggest the population may be stable at a reduced level at this time.

An apparent decline in numbers over the past few years, especially since the mid 1990s, was observed. Climate is a determining factor for the summer brood counts. It should be

noted that this was a period of low annual precipitation resulting in poor vegetation production.

Over the long term, summer brood counts have shown similar trends to those observed for strutting activity. The data suggest a general seven to ten-year cycle with rises and declines in production. Both lek counts and brood counts are low compared to all-time highs in the 1970s but seem to be currently stable. Climate certainly has an impact on production for this population. Drought and deteriorating habitat throughout the area may explain the general decline of sage-grouse for this PMU. Additional research is needed to identify population risks and mitigation to allow the population to increase to its previous higher levels.

Harvest. Harvest data come primarily from the Mount Grant (Lapon Meadows) area. However the data from the 1970s and the early part of the 1980s may include the Aurora and Nine Mile Flat areas.

Past data showed the average harvest in the 1970s to be 207 birds per year and an average of 156 hunters per year. The following decade had an average harvest of 131 birds per year and an average of 90 hunters per year. During the 1990s the harvest decreased to an average harvest of 61 birds per year with and average of 46 hunters per year.

There has not been a season in this PMU since 1978. According to lek counts and brood surveys the population in this PMU is in a low but stable state at this time.

7.4 Mount Grant PMU Risk Assessment and Conservation Actions

Existing and foreseeable risks evaluated for the Mount Grant PMU include pinyon-juniper encroachment, power lines, mining, off road vehicles, wild horses, livestock grazing, wildfire, predation, hunting and poaching, and a shortage of brood habitat. Each is discussed in detail below.

7.4.1 Pinyon – Juniper Encroachment

Pinyon-juniper encroachment onto leks will potentially impact lek activity. One historically used meadow above the China Camp lek is cut off by P-J expansion into traditional sagebrush habitat.

No sage-grouse have recently been observed on Powell Mountain, although a historic population is documented. Powell Mountain is surrounded by P-J encroachment that may have fragmented the population.

Mount Hicks also had a historic sage-grouse population. This lek has not been surveyed for quite some time. It is difficult to access by ground. Views from the air appear to show increased pinyon-juniper invasion.

Mount Grant is separated from adjoining occupied habitat in Nine Mile Flat and other areas of the PMU by a broad band of pinyon pine. Biologists do not believe that the pinyon band impedes movement between habitat segments. However, it is believed that a broader corridor of sagebrush connecting the segments would benefit the bird. Pinyon has also invaded the bottom of Cottonwood Canyon.

Conservation Action: Pinyon – Juniper Encroachment

Risk: Loss of Sagebrush habitat in the Mt. Grant PMU breeding area complexes due to encroachment of pinyon pine.

Objective: Convert or remove pinyon pine where it is encroaching into breeding area complexes. Treat approximately 5,000 acres over the next 15 years.

Action: Remove pinyon overstory with most appropriate technique (cutting, burning, chaining, pesticide, etc.) See individual Activity Plans for each project area, below.

Rationale: Those areas within two miles of the lek, that are classified as Phase I (few to many small trees not affecting understory, < 11% canopy cover) and Phase II (12-54% canopy cover, rapid tree growth, declining understory) were selected for removal of pinyon overstory. Treating Phase 1 and II is more effective than treating Phase III (tree dominance, little understory, > 55% canopy cover). Treatment of Phase I will maintain existing habitat and treatment of Phase II will increase the amount of habitat in the Mt. Grant PMU Complex.

Legal Authority: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest and some private parcels scattered within the Forest Service boundaries.

Procedural Requirements: Projects addressing this risk are within the management responsibility of the Bridgeport Ranger District, Humboldt-Toiyabe National Forest and some private parcels scattered within the Forest Service boundaries.

Level of Partnership Commitment: It is believed that the private landowners will be willing to partner with the Forest Service and the local planning group. Agreements will be solicited prior to project approval. The Nevada Division of Forestry Inmate Crews will be considered for some project-work.

Funding Source**:** The Forest Service needs to plan for and request FY 2005-2015 funding as projects are developed, approved and budgeted for by the Forest Service. A small grant may be forthcoming from the Nevada Wildlife Federation.

Implementation Process:

1. Project Planning: Forest Service
   2005
   a. Identify action location
   b. Enter into budget planning
   2006
   a. Schedule Heritage and Biological surveys
   2007
   a. Identify Proposed Action for treatment
   b. Complete Environmental Analysis

2. Project Implementation: U.S. Forest Service, NDOW, Nevada Division of Forestry (NDF) Partners (2006-2015)
   a. Budget for Projects
   b. Plan for Partnership
   c. Implement Project(s)

3. Project Monitoring: Forest Service/NDOW (2006-2015)
    a. Forest Service will monitor implementation for consistency with the proposed action. Monitor change in percent canopy cover of pinyon before treatment and one year after treatment. Complete additional treatment required to accomplish the project proposal.
    b. NDOW continue monitoring sage-grouse populations through lek counts for
    changes in numbers of males visiting leks. NDOW to maintain trends and reports.
    c. Report accomplishments to US Fish & Wildlife Service (USFWS), Reno NV.

Activity Plans:

1. *Activity Site P1: China Camp Lek* - Approximately five road miles SW from the Ninemile Ranch on FS Road 045 (DeLorme & USFS topo maps, T6N, R27E, NW 1/4 Sec29 at the old FS boundary (cattle guard), progressing directly south on FS Road 045 to the China Camp Meadow (SW ¼ Sec 29). The project goes west into the draw of the intermittent creek below FS Road 045. Lek site UTM: Easting 326050, Northing 4247300, directly north of the cattle guard. High Priority
    a.
    b. Elevation 6,550-6,800 feet.
    c. Aspect West
    d. Dominant understory: Primarily mountain big sagebrush/Wyoming big sagebrush and some forb/grass component.
    e. Pinyon Phase: Phase II and moving up slope to Phase III. The removal of trees between the lek and the meadow will open up the area to allow for sage-grouse to walk broods to the meadow from the nesting sites.
    f. Acres: 130
    g. Soil Type: 3110 from the Mineral County Soil Survey
    h. Other Existing Uses:
        - Livestock grazing: Flying M from June- September
        - Deer: Limited use for winter range
        - Pronghorn antelope: Year-round

2. *Activity Site P2: China Camp Lek 2* - Approximately four miles form Ninemile Ranch west to FS Road 154, 1.7 miles from the Walker River Road, then west to the ridge top. UTM: N 4249800, E 326700 (Delorme & USFS topo maps, T7N, R27E, and SE ¼ SEC 17). Medium priority.

    a. Elevation 6310 feet
    b. Aspect: Northeast
    c. Dominant Vegetation: Low sagebrush.
    d. Page 3
    e. Pinyon Encroachment
    f. Pinyon Phase: Not affecting the understory; however, trees are encroaching onto the lek and should be removed before a problem develops. No more than 20 trees. Can be done by a small volunteer group (Gale Dupree).
    g. Acres: 20

h. Soil Type: 3110 on the Mineral County soil map.
i. Other Existing Uses:
   - Livestock grazing: Flying M June to September
   - Deer: Some winter use
   - Pronghorn antelope: Year-round

3. *Activity Site P3:* Meadow south of Gregory Flats; approximately one mile from the Aurora Mine pit or the mine office. The meadow is believed to be managed by the Forest Service (it could be mine property) and consists of 20 acres of mixed forbs, Carex, Juncus and grasses. Some sagebrush is encroaching onto the meadow along with pinyon encroachment from the south and east. (DeLorme & USFS topo maps, T5N, R28E, center of Sec 17). Medium priority.

   a. Elevation 7,200 feet
   b. Aspect West
   c. Dominant understory: Primarily mountain big sagebrush adjacent to the meadow.
   d. Pinyon Phase: Phase II moving down slope towards the meadow. The removal of all trees within 100-200 yards of the meadow would put predator perches farther from the meadow and reduce concealment for ground predators. More ground water may become available for the meadow.
   e. Acres 10
   f. Soil type
   g. Other existing uses:
      - Mining: potential for startup with gold prices above $300 per ounce.
      - Livestock and wild horse use appears to be limited on this meadow; however, elsewhere in this plan we propose to move the wild horse herd boundary to the east and ask that wild horses be restricted from the area until it can be determined what impact the horses have had on this area. Meadows above this meadow appear to have been impacted by wild horse use.
      - Deer and pronghorn antelope: Limited summer use.

4. *Activity Site P4:* Chinese Camp mostly on private property and some USFS. T6N, R26E, Sec. 26, SE ¼. Need to identify ownership of the land and spring. Obtain approval of the project. Low priority.

   a. Elevation 6500 feet.
   b. Aspect: East
   c. Dominant Overstory is Great Basin big sagebrush and scattered pinyon pine. Understory is rye grass and other grasses. It is uncertain how the understory would change with overstory removal. This spring site is filled in by large Great Basin big sagebrush and pinyon pine. Removal of these species would allow for meadow restoration. Estimate 40 acres of clearing. A more detailed treatment plan is needed. It is questionable if sage-grouse will return to this site unless considerably more acres of trees are removed.
   d. An archeological survey is needed

e. Acres: 200
f. Other existing uses:
   - Livestock grazing by Flying M Ranch
g. Costs: $12,000

7.4.2 Power lines

The California power transmission line fragments the Mt. Grant PMU. Several power transmission lines within the unit provide perches for raptors to be in a position to prey upon sage-grouse activity, resulting in loss of production. During the previous three years of lek counting a raptor has not been observed watching leks. This does not account for the period of hatching and early and mid brood rearing.

Initial Conservation Strategy

The Bi-State planning group would like to encourage the power company responsible for the power transmission lines to provide anti roosting devices where the lines traverse through critical sage-grouse habitat. The group would be willing to provide advice as to where these devices would be needed.

7.4.3 Mining

Two mining operations are present in the Mt. Grant PMU: Borealis and Metallic Ventures Inc., near Aurora, NV. Currently there is mining activity occurring in the Aurora area by Metallic Ventures Inc. Historic mining activities have occurred throughout this area and consisted mainly of open pit mining.

Recent mining by Metallic Venture Mining Company has impacted hundreds of acres of habitat. The mine pit is in an area that was once a surveyed brood site. Questions have been raised as to whether the mine pit, now approximately 148 feet deep and full of water, indirectly impacted groundwater availability for the meadows between Aurora Peak and Brawley Peak.

A Metallic Ventures (U.S.) Inc. representative informed the Mount Grant PMU Committee that the company is preparing to resume mining in the pit. Current and future mine exploration activities may result in new mines with the potential to impact additional acreage that will further reduce and fragment sage-grouse habitat.

Extreme caution needs to be taken when approving future and current exploration activities in order to protect important sage-grouse habitat. Current and future mining activities also need to be monitored to insure that important sage-grouse habitat is not forfeited.

Initial Conservation Strategy

Work with mine operators during the permit process to avoid, minimize and mitigate direct impacts to critical sage-grouse habitat.

7.4.4 Off Highway Vehicles

Off Highway Vehicle (OHV) use in the Mt. Grant PMU is restricted to designated routes. There are several roads that are used which are not in designated areas. These roads are causing damage to meadows, which may have the potential for sage-grouse use. The roads having the largest concern in this PMU are located in the Aurora area. Several of these roads run through meadows, but are located on private property.

Initial Conservation Strategy
Provide alternate routes around meadows and reclaim exiting roads through meadows.

Conservation Action: Educational Programs For OHV And Recreational Users

Risk: OHV use within the PMU is causing habitat damage to some meadows.

Objective: Educate private landowners of road damage and repair to improve these areas. Educate OHV users and recreationists of the importance of maintaining sage-grouse habitat within this area, and that they should remain on the designated routes.

Action: Education programs can be run by both NDOW and the US Forest Service. Private property programs can be presented by NRCS and the FWS on the importance of maintaining and improving sage-grouse habitat on their lands.

Rationale: Educating the public and private landowners can increase awareness of maintaining critical habitat for sage-grouse.

Legal Authority: NDOW, US Forest Service, NRCS and FWS all can play a part in this project.

Procedural Requirements: Education programs will have to be organized with co-operation with all agencies involved.

Funding Source: Funding may come from many different sources and all will be considered when implementing this project.

Implementation Process:
1. Project planning (2006)
2. Project implementation (2007)
3. Project monitoring: Forest Service/NDOW (2007-2010): NDOW continue monitoring sage-grouse populations through lek counts and brood counts. Report accomplishment to USFWS, Reno Office.

7.4.5 Livestock Grazing
There are nine permitted livestock grazing allotments administered by the Forest Service within this PMU. BLM administers 10 livestock grazing allotments. Livestock grazing utilization standards for the Forest Service allotments can be found in the Toiyabe Land and Resource Management Plan (1986) and BLM standards are found in the ____. Impacts from livestock grazing can include trampling of nests and reduction of understory cover available for nesting sage-grouse.

Currently the US Forest Service, Bridgeport Ranger District is conducting an Environmental Assessment (EA) of the livestock grazing allotments in this area. New grazing utilization standards are being considered in the proposed action and will help improve habitat for sage-grouse. This EA will be signed in 2004.

In the Mud Springs area there are several trespass livestock present, which may also be impacting sage-grouse habitat. The US Forest Service and the BLM are responsible for

alerting the owner of the trespass livestock and then the owner is responsible for removing the livestock.

Additional Data Needs to Verify and Further Characterize the Risk:
Identify nesting habitat through telemetry studies.

Initial Conservation Strategy:
Manage distribution of livestock to avoid critical nesting habitat.

7.4.6 Wild Horses

Three wild horse and burro territories are present within this PMU. There are several horses located outside the Powell Mountain Territory that are negatively impacting sage-grouse habitats. Impacts of wild horses to sage-grouse habitat are the same as with livestock grazing.

The Humboldt-Toiyabe National Forest (HTNF), Bridgeport Ranger District, manages the Powell Mountain WHT with the Appropriate Management Level (AML) goal of 26 horses. The Bureau of Land Management (BLM) and National Forest management goal is zero horses outside of the established territory boundaries. Federal horse removal programs are active in attempts to meet these goals. In July 2003, BLM Wild Horse and Burro specialists from Ridgecrest, CA captured and removed 26 horses from the Powell Mountain WHT. An additional 7 horses were captured and removed from the Bodie Hills outside of the designated territory. An estimated 30 horses remain in the Powell Mountain WHT and an estimated 11 horses remain in the Bodie Hills outside of the territory. During the course of the capture, 10 of the remaining Bodie Hills horses were at least temporarily driven into the Powell Mountain WHT. Future management should focus on removing all feral horses outside of established territory boundaries and maintaining AML goals within the Powel Mountain WHT.

The wild horse and burro territory boundaries have been determined under the Wild Horse and Burro Act and cannot be changed or altered unless Congress approves the change. It is the responsibility of the US Forest Service and the BLM to remove any wild horses located outside of the territory boundaries.

Initial Conservation Strategy
Restore meadow habitat located within the Powell Mountain Wild Horse Territory on lands administered by the U.S. Forest Service.

Conservation Action: Removal Of Wild Horses Outside Of Wild Horse And Burro Territories

Risk: Wild horses may trample nests, reduce understory cover and impact forage needed for sage-grouse.

Objective: Limit impacts of wild horses on sage-grouse habitat outside of a Wild Horse and Burro Territory

Action: Conduct a wild horse gather for those horses outside of the designated Powell Mountain Wild Horse Territory, in the Baldwin Lek area within the Ninemile Cattle & Horse Allotment.

Rationale: The Baldwin Lek area has 9-11 wild horses using it during the nesting and brooding season. Removing them complies with USFS and BLM horse management goals and protects sage-grouse habitat outside the WHT from wild horse impacts.

Legal Authority: This project would involve interagency corporation between the Bureau of Land Management and the US Forest Service. Horses outside of this territory are on both BLM and Forest Service administered lands.

Procedural Requirements**:** NEPA would have to be conducted for this project by the US Forest Service.

Funding Source: Funding for this project would be the responsibility of the BLM and US Forest Service agencies. The costs are:

1. Wild horse removal: $1,500/ head (this includes capture, removal, adoption)
2. Equipment: Trailer
3. Labor: BLM and US Forest Service

Implementation Process:

1. Project Planning: Forest Service and BLM
   2008
   a. Identify action location
   b. Enter into budget planning
   c. 2009
   d. Schedule Heritage and Biological surveys
   e. 2010
   f. Identify Proposed Action for treatment
   g. Complete Environmental Analysis
2. Project Implementation NDOW/Partners (2006)
   a. Budget for project
   b. Budget for partners
3. Project monitoring: NDOW (2006-2014): NDOW continue monitoring sage-grouse populations through lek counts and brood counts.

7.4.7 Wildfire

Wildfire has not been a past problem in the Mount Grant PMU. Limited access lowers the risk of man-caused fires. Lightning strikes usually coincide with thunderstorms. Only three recent fires have been identified in the PMU. One fire was approximately 10 acres on Mount Grant. It was controlled. A second 10-acre fire near Aurora Peak was controlled. The third fire, northwest of Mt. Hicks in the P-J woodlands, was also controlled. The largest and most recent fire was the 400-acre Aurora fire.

The Cottonwood Canyon fire was man-caused approximately 10 years ago. Recent observations of the burn showed extensive invasion of cheatgrass. At another site, cheatgrass was observed at an elevation of 9,080 feet indicating that there is no elevation limit on the potential for cheatgrass establishment.

Initial Conservation Strategy
Implement fuel reduction treatments if determined beneficial for the protection of critical habitat.

Use prescribed fire in accordance with the WAFWA Guidelines in areas that can benefit from fire treatment.

7.4.8 Predation
Predation has not been documented to be a problem in this PMU. Ravens are not abundant. Coyotes occasionally take sage-grouse on a year round basis.

Under current conditions, predation is not thought to be a problem. Monitoring is necessary to determine the predation threat. As populations increase it is necessary to continue population monitoring efforts in order to evaluate the threat. If predation is deemed to be a population limiting factor, then it will become necessary to provide whatever methods are needed to address the threat.

7.4.9 Hunting / Poaching
There has been no hunting season for sage-grouse in the Mount Grant PMU for over five years. Falconry has recently been disallowed in the PMU. It is recommended that this restriction remain in place until such time that this population reaches a level that is considered huntable. At that time general harvest regulations will be acceptable including the take of sage-grouse by the use of falconry.

Acceptable harvest regulations should be considered when the population reaches levels as described by WAFWA guidelines. California and Nevada should develop a standardized approach to a harvest program agreeable to both states.

Poaching is not considered to be a significant risk in the PMU since much of the access is restricted. However, good access to the Nine Mile Flat area has resulted in documented poaching. Continued law enforcement efforts need to be directed to areas which are considered sensitive in relation to population status. This would especially include the Bi-state conservation area.

Initial Conservation Strategy
Expand public information and awareness on Project Game Watch and the objectives for sage-grouse conservation.

7.4.10 Shortage of Good Quality Brood Habitat
Lowering water tables, historic grazing, and pinyon invasion have impacted meadows throughout the PMU. Headcutting has been observed in limited locations. Sagebrush encroachment was observed in the Upper Lapon Meadow Complex.

Conservation Action: Meadow Restoration - Aurora Meadow Complex

Risk: Loss of meadow habitat (nesting and breeding) for use by sage-grouse in the spring and summer within the Mt. Grant PMU. Sagebrush is the dominant vegetation type within this project area. The area has been used by Off Highway Vehicles (OHV) which have caused damage to a few meadows. The water level in many of these meadows appears to have lowered; many have become dry and are being encroached upon by sagebrush. One meadow, the “Barrel Meadow,” has a deep gully and water is not flowing across the entire

meadow area. An old fence encloses the top portion of the gully and is in disrepair. In Aurora Valley many of the meadows have roads running through them, and appear dry.

Objective: Restore meadow habitats located in T5 N., R28 E, sections 28, 29, 32 and 33 on private property to Proper Functioning Condition (PFC).

Action: Conduct PFC assessment for each meadow and take corrective measures. See individual action statements for each project area location, below.

Rationale: By using the PFC method of assessing these meadows we will be able to determine the priorities and the problems facing them more accurately, and what can be done to bring them to Proper Functioning Condition. Individual actions prescribed below are expected to improve meadow conditions for sage-grouse.

Legal Authority: Primarily private land owner.

Procedural Requirements**:**

1. Private landowner will have to obtain the permits needed for construction or project work that may be applicable to this project.
2. For re-routing the road, the landowner will have to consult with the US Forest Service, Bridgeport Ranger District, Humboldt-Toiyabe National Forest. The US Forest Service is responsible for allowing road access to private property, but re-routing roads is a possibility in areas were resource damage is occurring.

Funding Source: Funding projects on private property will be at the landowner's expense (Grant request). Volunteer workers can be used for labor where necessary.

Implementation Process:

1. Project planning (2006)
2. Project implementation (2007)
3. Project monitoring: Forest Service/NDOW (2007-2010): NDOW continue monitoring sage-grouse populations through lek counts and brood counts. Report accomplishment to USFWS, Reno Office.

Project Area Locations:

Aurora Meadow Restoration- Big Meadow (M1)- in T. 5N R. 28 E. Section 28 above Aurora, NV. Meadow vegetation includes sedge species and some grass species. The meadow is in good condition with only one swell, which is draining water from the meadow. This meadow has the highest potential for sage-grouse use in the Aurora area. Some sage-grouse where flushed during a field trip in 2002. See photo M-1. High priority.

Action**:**

Remove the old boundary fence surrounding the meadow and build a sage-grouse "friendly" fence if it is necessary to have the area fenced off. Build loose rock check dams in swells found within the meadow no larger than a few inches high. These create an area in which water can spread to a small area and keep water in the meadow for a while longer.

Figure 7-1. Big Meadow.

Project:

Aurora Meadow Restoration- Aurora Peak Meadows (M2)- This meadow is located below a stream runoff. A barrel has been placed in the stream channel and is preventing water from reaching the meadow. There are some side-channels and the meadow is becoming dry with sagebrush encroachment. This area is approximately 150 acres. See photo M-2. T. 5N R. 29 E. Section 28 above Aurora, NV. Medium priority.

Action:

Remove the barrel that has been placed in the stream channel. This may allow more water to flow into the meadow. Re-contour areas with headcuts and side channels to allow for water runoff to remain in the meadow for a longer period. Also place loose rock dams where they may help water remain in the meadow. Prescribe a sagebrush treatment with herbicide, cutting or other mechanical treatments to help restore meadow vegetation.

1. Remove barrel in stream channel
2. Re-contour areas with headcuts and side channels
3. Construct loose rock dams in swells
4. Sagebrush treatment (herbicide, cutting or other mechanical treatments)

Schedule:

1. Project planning (2008)
2. Project implementation (2009)
3. Project monitoring: Forest Service/NDOW (2009-2010):NDOW continue monitoring sage-grouse populations through lek counts and brood counts. Report accomplishment to USFWS, Reno Office.

Figure 7-2. Aurora Peak Meadow.

Project:
Aurora Meadow Restoration- Junction Meadow (M3). This meadow area is located at the junction of two US Forest Service roads T. 5N R. 28 E. Section 29 above Aurora, NV. above the Aurora area. It is located on private property. The meadow has severe headcuts and channeling preventing water from moving across the meadow. Approximately 60 acres. Low priority.

Action:
Re-contour the headcuts and channeling to allow for water to move across the meadow. Place loose rock dams in any swells to help water remain in the meadow for a longer period of time.

Schedule:
1. Project planning (2009)
2. Project implementation (2010)
3. Project monitoring: Forest Service/NDOW (2010-2017):NDOW continue monitoring sage-grouse populations through lek counts and brood counts. Report accomplishment to USFWS, Reno Office.

Project:
Aurora Meadow Restoration – Top Meadow (M4)- This meadow has many swells and ruts that are causing early water run-off and not allowing water to spread through the meadow. This meadow appears dry and has encroaching sagebrush. See photo M-3. T. 5N R. 28 E. Section 29 above Aurora, NV. Approximately 60 acres. High priority.

Action:

Construct loose rock dams in swells, which allow water to stay in the meadow longer and move across the field. Realign the road running through the meadow. This is causing ruts in the meadow. Re-contour the areas where ruts are causing meadow damage. Sagebrush removal treatments may be necessary to allow for more water in the meadow. This may include herbicides, cutting or other mechanical methods.

Schedule:

1. Road realignment project planning: Forest Service
   2010
   a. Identify action location
   b. Enter into budget planning
   2011
   a. Schedule Heritage and Biological surveys
   2012
   a. Identify Proposed Action for treatment
   b. Complete Environmental Analysis
2. Project Implementation Forest Service/Partners (2011)
   a. Budget for project
   b. Budget for Partners
3. Project monitoring: Forest Service/NDOW (2012-2014):
   a. NDOW continue monitoring sage-grouse populations through lek counts and brood counts.
   b. Report accomplishment to USFWS, Reno Office.

4. Project monitoring: Forest Service/NDOW (2007-2010): NDOW continue monitoring sage-grouse populations through lek counts and brood counts. Report accomplishment to USFWS, Reno Office

Figure 7-3. Top meadow.

Project:
Aurora Meadow Restoration – Barrel Meadow (M5)- This meadow is located on private property and borders the US Forest Service, Bridgeport Ranger District, Humboldt-Toiyabe National Forest. This meadow has many swells and headcuts. A large water tank and trough are located in the meadow and a large pool is located at the northern end of the meadow, which may be preventing water from flowing over the meadow. See photo M-4. T. 5N R. 28 E. Section 32 above Aurora, NV. Medium priority.

Action: Fill in pool located at the northern end of the meadow. Remove fence around pool and if necessary replace it with a sage-grouse "friendly" fence. If not in use at the present time, remove water tank and trough located in the meadow. Try to re-contour areas where ruts or large headcuts occur. Place loose rock dams in swells.

Schedule:
1. Project planning (2010)
2. Project implementation (2011)
3. Project monitoring: Forest Service/NDOW (2011-2018):NDOW continue monitoring sage-grouse populations through lek counts and brood counts. Report accomplishment to USFWS, Reno Office.

Figure 7-4. Barrel Meadow.

Project:
Meadow Restoration SW of Gregory Flat (M6)- High priority. T. 5 N R. 27 E. Sections 16 & 17 south of Humboldt Hill. It is believed to be located on both forest service and mine property

Description: Estimate 16 acres or more of meadow restoration. A good flowing spring feeds the meadow. The meadow is being encroached by sagebrush on all sides. The west end is cut by a road and a mine road above the meadow parallels the north edge. Pinyon pine is advancing onto the meadow from the south.

Action: Remove sagebrush from all sides of the meadow for a 100 yard radius from the edges of the grassy vegetation. Remove all pinyon within the meadow area and up slope from the medow for 400 yards. The spring head was dammed many years ago to create a pond which is now heavily surrounded by large sagebrush bushes. It is recommended removing the sagebrush and replacing with a planting of native grass and forbs seeds. The meadow is infested with thistle (Scotch thistle (?), *Onopordum acanthium L.*) just sprouting during the last visit. The thistle can be dug up, bagged and removed from the site. It will probably take a few years of continued removal in the early spring before all of the thistle will be removed due to seed spread. This action can be done immediately with mine approval for access (Gale Dupree and Fred Smith will pursue).

A few plants of Tall white top, *Lepidium ledifolious L.* were found growing on the far southwest edge of the meadow. The FS was to take note of this and take action to stop this spread. Follow-up is needed to confirm any action. Digging is not recommend; however, with a few plants currently present, digging and pulling it up now and with an annual follow-ups could eliminate this invasive plant from the meadow.

It is recommended that the meadow area can be increased in size by the above noted actions. The dryer areas of the meadow would them be irrigated with water pumped form a capped forest service well about ½ mile east of the meadow. There is electricity to the well. An aeration wind mill could be procured form Canada for around $1,000 and installed at the well and it would pump sufficient water to irrigate the meadow. These windmills are virtually maintenance free. Once the meadow returns to a desired state, the well could be capped again.

A meadow restoration expert is required to write a prescription for more detailed needs, such as how to distribute the spring water evenly across the meadow and what plant mixture is desired and how to obtain the mix. The prescription should probably include some short term grazing by livestock.

Scheduling and costs:

1. Project planning: NDOW/FS
   2005
   a. Identify action location
   b. Enter into budget planning
   c. Identify proposed action for treatment
   d. Complete Environmental Analysis
2. Project Implementation NDOW/Partners (2006)
   a. Budget for project
   b. Budget for partners
3. Project monitoring: NDOW (2006-2015)

Description: Estimate 16 acres of meadow restoration. A separate project to remove pinyon will be found under Pinyon-Juniper Encroachment.

Project:
Powell Mountain Spring Restoration (M7). Estimate two acres of spring needing restoration by fencing to keep wild horses and livestock out of the spring. Location is south of Powell Mountain. T5N R30E, Sec. 1 SE ¼ SW ¼. The spring is thought to be in the NE corner of private property. If this is correct, the landowner needs to be contacted for approval of any improvements and water rights must be determined. The spring needs further identification to properly locate it. Medium priority.

Action:
Remove the old fencing material around the spring. Sink a pipe ant the source of the spring with a minimum diameter of 6" to be used for solar pumping that could distribute water to other areas of this high sagebrush flat. The spring source area to be fenced is a minimum of two acres. The permittee or private landowner will maintain these structures during their period of use.

Project:
Ninemile Ranch, Rough Creek Meadows and Alfalfa Pivot (M9): This project area is on private property owned by the Flying M Ranch. 1300 acres of meadow area on both sides of Rough Creek. There is a 150-acre alfalfa field irrigated by a center pivot system, which is watered all summer producing two crops per season. Following the cutting, sage-grouse feed on insects and the low growing alfalfa in the cut field for several days. In 2002 and 2003, 155 sage-grouse were counted on the cut field. The alfalfa field is a collecting area for sage-grouse right after the meadow is mowed. It is important that this use continues in the future as it appears to be sustaining the present population of sage-grouse. This could be a conservation easement to keep the land as is. This is a very high priority for telemetry work. We do not know where nesting, wintering or brood rearing occurs, except for the alfalfa field in the summer.

Currently, the ranch does not use insecticide and is asked not to use any in the future as it could have a negative impact on the sage-grouse using this field.

The newly discovered Ninemile Lek on BLM land is less than one mile from the ranch property.

Action:
Discovery of the Ninemile Lek shows a need for more data on the sage-grouse use for the Rough Creek Meadow area. A study needs to be conducted to determine if and when the sage-grouse use the remainder of the Rough Creek Meadow, including conducting surveys to find nesting and brooding sage-grouse within the lek complex.

Schedule:

1. Project planning: NDOW

2005

a. Identify action location
b. Enter into budget planning

c. Identify Proposed Action for treatment
d. Complete Environmental Analysis

2. Project Implementation NDOW/Partners (2006)
    a. Budget for project
    b. Budget for partners

3. Project monitoring: NDOW (2006-2014)
    a. NDOW continue monitoring sage-grouse populations through lek counts and brood counts.

Projects: Hawthorne Army Ammunition Depot (HAAD) has some of the best sage-grouse habitat on the Mount Grant PMU due to the exclusion of livestock grazing and the public; however, some of the meadow areas have become decadent due to various non-uses.There are three meadow restoration projects on Mount Grant, Hawthorne Army Ammunition Depot. The projects are located on R. 28 E. T. 8 N., Section 24, Lapon Meadows. More forbs are needed to improve the habitat for sage-grouse.

Conservation Action: Powell Mountain Guzzler Installation

Risk: Loss of sage-grouse due to lack of water in the habitat area. Priority is low.

Objective: This project will help spread water to critical areas.

Action: The U. S. Forest Service and NDOW should provide a minimum of two big game guzzlers on this relatively dry mountain for use by other species of wildlife including sage-grouse and pronghorn antelope. Solar power possibilities should be explored in the use and distribution of guzzlers

Rationale: Both of these species were in this area in recent times.

Legal Authority: U.S. Forest Service and NDOW will have responsibility for this project. Implementation will be done by the Forest Service and project monitoring and help of construction will be provided by NDOW.

Procedural Requirements: Areas need to be determined for placement of these guzzlers. NEPA will need to be conducted for the placement of these guzzlers.

Funding Source: NDOW, Bridgeport Ranger District Humboldt-Toiyabe National Forest

Implementation Process:

1. Project Planning: Forest Service
    2009
    a. Identify action location
    b. Enter into budget planning
    2010

a. Schedule Heritage and Biological surveys

2011

a. Identify Proposed Action for treatment
b. Complete Environmental Analysis

2. Project Implementation Forest Service/Partners (2009-2011)
    a. Budget for project
    b. Budget for Partners
3. Project monitoring: Forest Service/NDOW (2011-2013):
    a. NDOW continue monitoring sage-grouse populations through lek counts and brood counts.
    b. Report accomplishment to USFWS, Reno Office.

Conservation Action: Sage-grouse Telemetry Study

Risk: There is a lack of knowledge in this PMU regarding sage-grouse distribution.

Objective: This project will help determine the locations of sage-grouse throughout the PMU. Critical habitat locations will be identified, such as wintering areas.

Action: NDOW will provide the collars and telemetry equipment. Ten birds will be collared the first year of the study and in subsequent years more birds will be collared. Tracking will then take place for one year or for the life of the collaring equipment.

Rationale: Information is needed for the location of critical areas, such as wintering areas, in order for land managers to protect and maintain those areas for sage-grouse. This project will also help determine future projects.

Legal Authority**:** NDOW will be the lead on this project. This project has the potential to be a University of Nevada, Reno (UNR) Graduate project as well.

Procedural Requirements**:** Areas where birds are most likely to be captured will have to be determined. If a UNR graduate student is conducting the project then any state permits will have to be obtained.

Funding Source: NDOW will be the lead for a funding source.

Implementation Process:

1. Project Planning: Forest Service
2005
    a. Identify action location
    b. Enter into budget planning
2. Project Implementation 2006
    a. Budget for project: Nevada BLM request for $25,000
    b. Budget for Partners
3. Project monitoring: Forest Service/NDOW (2006-2011)
    a. NDOW continue monitoring sage-grouse populations through lek counts and brood counts.
    b. Report accomplishment to USFWS Office Reno, Nevada

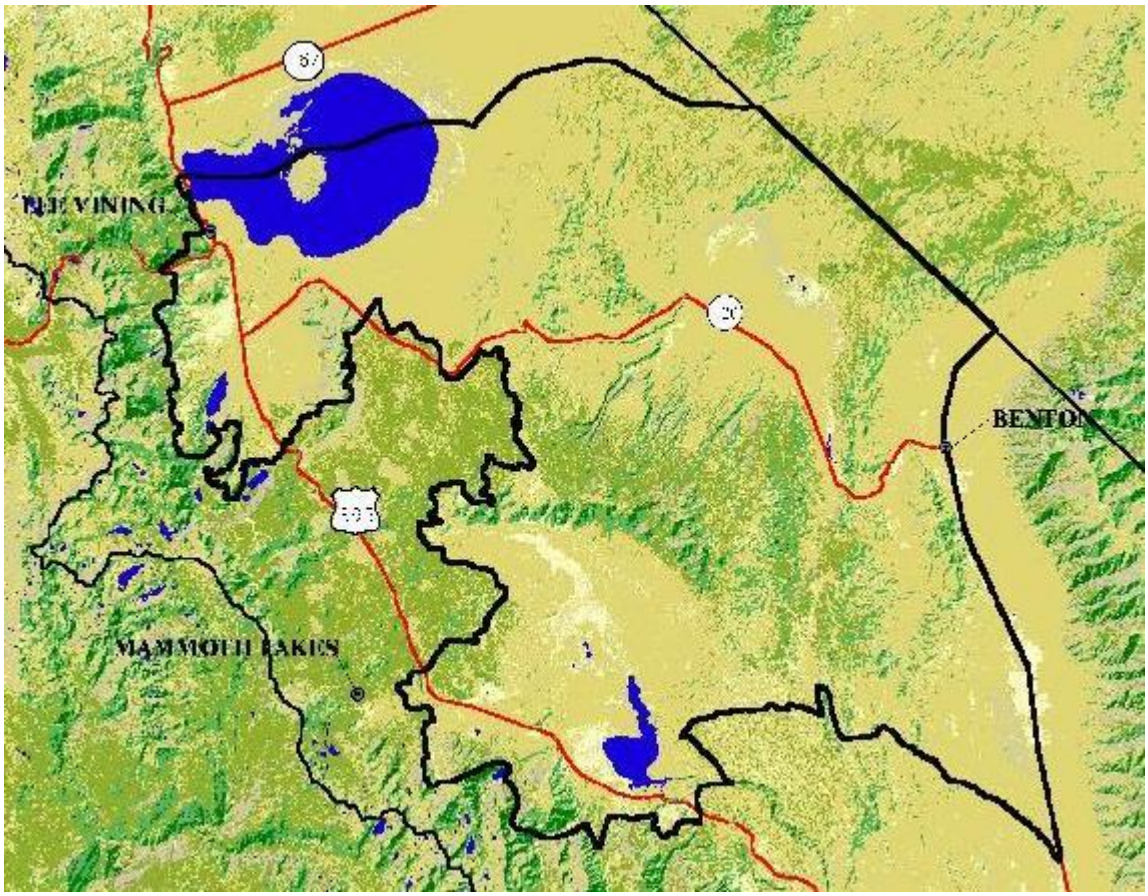
8.0 SOUTH MONO PMU

8.1 PMU Description

8.1.1 Location and Boundary

The South Mono PMU is approximately 582,768 acres in size and is located entirely in Mono County, California. The southern boundary extends from Highway 6 east to the California/Nevada border, north along the state line to the south side of Mono Lake then west towards Grant Lake, then south to Bishop (Figure 8-1).

Figure 8-1. South Mono PMU.



8.1.2 Land Ownership and Regulatory Jurisdictions

The majority of land within the South Mono PMU is National Forest land managed by the Inyo National Forest (Table 8-1). The Bureau of Land Management manages 34 percent of the PMU while County/City land (including LADWP holdings) makes up 8 percent. Private lands make up only 3 percent of this PMU.

Table 8-1. Land ownership in the South Mono PMU.

LAND MANAGER OR OWNER	PMU TOTALS	
	ACRES	PERCENT OF PMU
Total PMU Acres	**579,483**	
National Forest	312,084	54
Private	17,662	3
Bureau of Land Management	200,775	34
State Land	3,944	<1
County/City Land	44,578	8
Tribal Lands	441	<1

8.1.3 Topography and Climate

Elevations within the South Mono PMU range from 1300 meters (4250 feet) to 3400 meters (11,100 feet) at Glass Mountain. Average elevation within the PMU is 2150 meters (7000 feet). Major features within the PMU include Long, Adobe and Benton Valleys, the south end of Mono Lake; Crowley Lake, and the Benton and Glass mountain ranges. Large valleys characterize the region with gentle slopes separated by steep ranges. Annual precipitation is 14 inches, mostly falling as snow. Average maximum temperature is 83 degrees (F) in July. Average minimum temperature is 8 degrees (F) in January.

8.1.4 Vegetation Communities and Distribution

Several vegetation communities exist within the South Mono PMU including shrublands (170,000 hectares), grassland (12,981 hectares), pasture/hay (2,483 hectares) and forested areas (29,000 hectares) (Vogelmann et al. 2001). The shrubland habitat within the South Mono PMU consists primarily of five main types of sagebrush including low sagebrush (*Artemesia arbuscula spp. arbuscula*), Wyoming big sagebrush *(Artemesia tridentata spp. wyomingensus*), silver sagebrush (*Artemesia cana spp. viscidula*), mountain big sagebrush (*Artemesia tridentata spp. vaseyana*), and basin big sagebrush (*Atremesia tridentata tridentata*). Mountain big sagebrush and Wyoming big sagebrush are nearly equal in proportion while an impressive mosaic of the five types of sagebrush exists, especially mountain big and low sagebrush. Pure stands of sagebrush are rare in this PMU with most of the areas containing a mixture of other shrubs as well (primarily bitterbrush, Purshia tridentata).

Much of the low sagebrush in the PMU exists within Long Valley. Wyoming big sagebrush is common in the lower elevations throughout this PMU. In Long Valley, Wyoming big sagebrush is found primarily along the base of the Glass Mountain range. Mountain big

sagebrush seems to dominate the mid-elevation levels within this PMU while higher elevations tend to be a mixture of mountain big sagebrush and low sagebrush. At higher elevations, other plants are also common, including plateau gooseberry (*Ribes velutinum*), and balsamroot *(Balsamorhiza sagittata).*

Meadow habitats are limited in distribution throughout most of this PMU. Adobe Valley offers very little meadow habitat with some narrow riparian/meadow fringe areas, including irrigated meadows, along Adobe Creek and Indian Creek. Mono Basin area meadows exist primarily along Parker and Walker Creeks, and potentially some areas on the fringe of Mono Lake. Parker Meadow offers one of the few extensive irrigated meadows in the northern portion of this PMU. Meadow habitat is limited in the Glass Mountain range to small creeks and drainages. Meadow habitat is fairly extensive in the Long Valley portion of this PMU. A significant portion of the meadow habitat in Long Valley is due to extensive irrigation. Natural meadows occur in areas around Convict Creek, McGee Creek, Hot Creek and the Owens River.

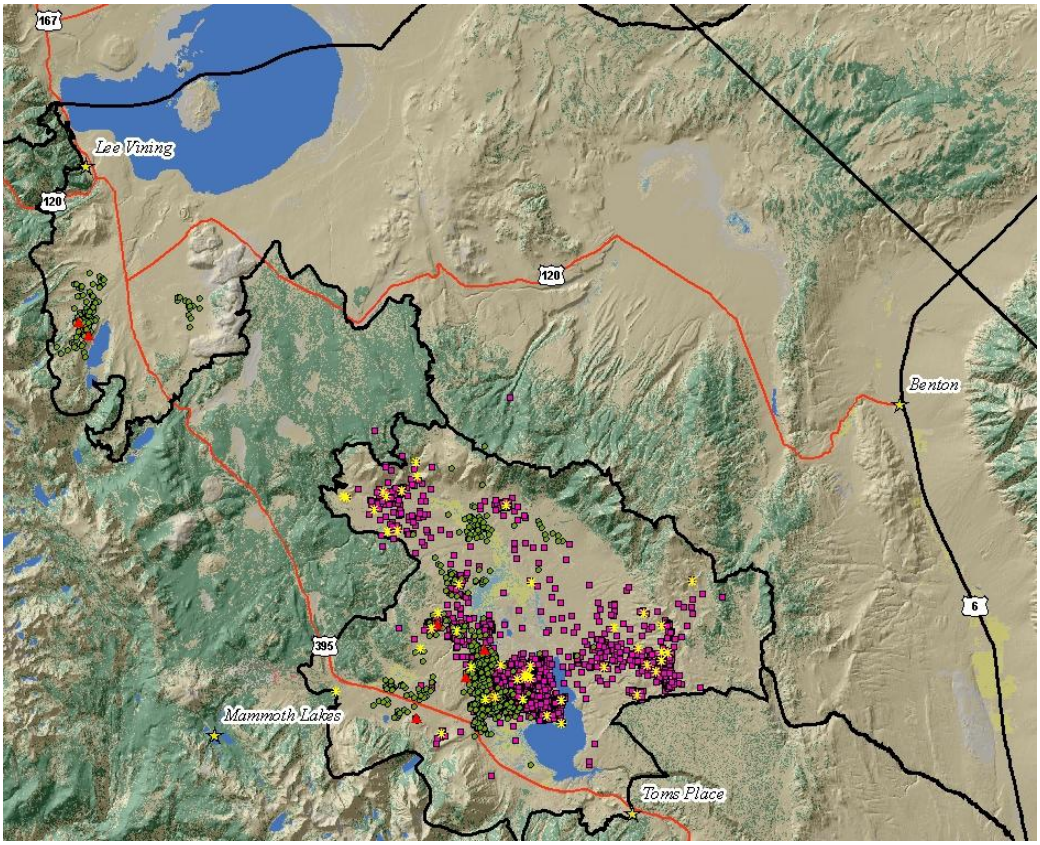
Although cheatgrass is present throughout this PMU, it has not established itself as a dominant vegetation type in any extensive areas. The vegetation communities within this PMU have responded well to fire events, with sagebrush communities re-establishing themselves in previously burned areas including past fires in the east Mono Basin and the McLaughlin fire.

8.2 Sage-grouse Habitat Description and Condition Assessment

Long Valley is primarily R0 (key) and R2 (understory limited) sagebrush habitats, with small amounts of R3 (Pinyon-juniper encroached) and R4 (potential sagebrush sites without sagebrush) areas. R1 (sagebrush limited) sagebrush conditions in the Long Valley area are the result of past fires, or chemical or mechanical treatments.

Radio telemetry has been used to identify seasonal use areas for sage-grouse throughout the South Mono PMU. Location data for sage-grouse were obtained by Gibson (unpublished data, 1984-2000) and the USGS (unpublished data, 2003). Individual bird locations as well as nest locations are given in Figure 8-2.

Figure 8-2. Radio-marked grouse locations in the South Mono PMU. (circles = USGS bird locations, triangles = USGS nest locations, squares = Gibson bird locations, star=Gibson nest locations)



8.2.1 Breeding Habitat

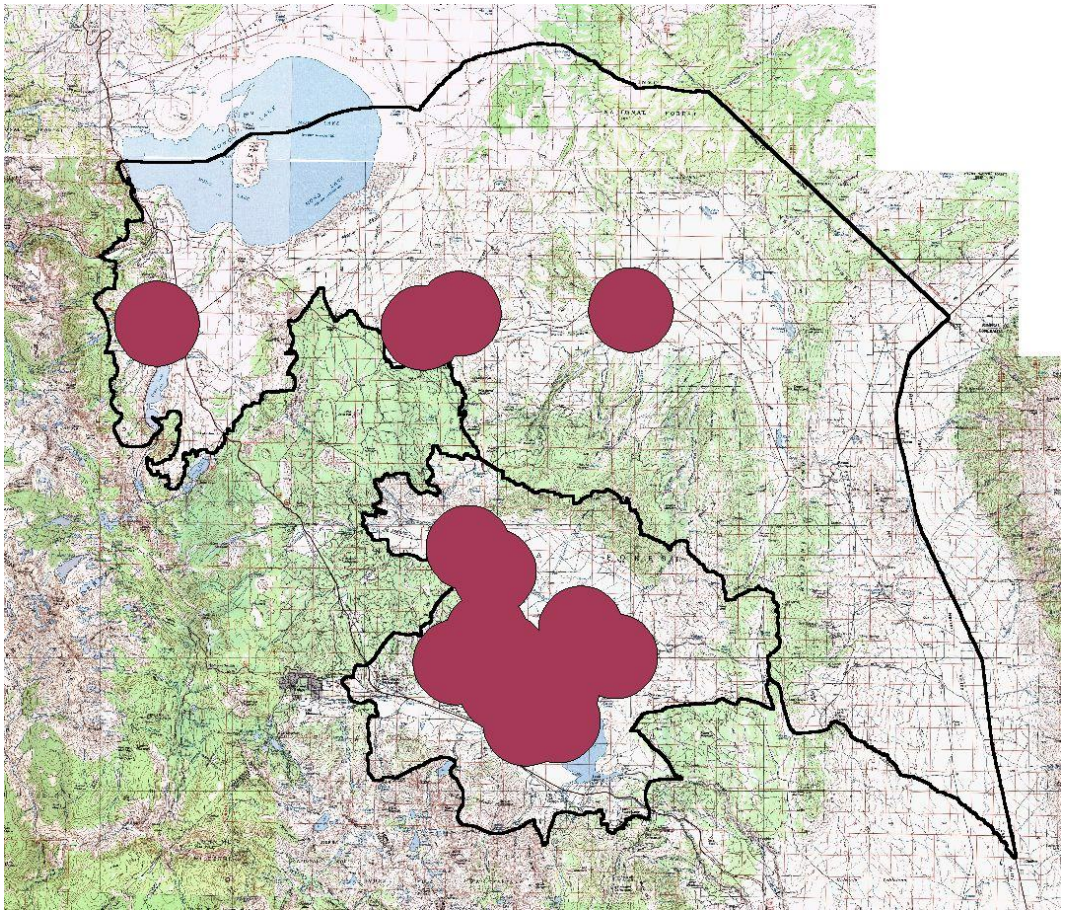
There are nine consistently counted active leks in Long Valley, one in the Parker Meadows area, and two in the Granite Mountain area. Table 8-3 lists the leks identified within the PMU and their status. Detailed lek count data can be found in Appendix ____.

Table 8-3. Activity status of known leks in the South Mono PMU.

LEK NAME	STATUS **
Long Valley 1	ACTIVE
Long Valley 2	ACTIVE
Long Valley 3a	ACTIVE
Long Valley 4	ACTIVE
Long Valley 5	ACTIVE
Long Valley 6	INACTIVE
Long Valley 7	INACTIVE
Long Valley 8	ACTIVE
Long Valley 9	ACTIVE
Long Valley 10a	ACTIVE
Long Valley 11	INACTIVE
Long Valley 12	INACTIVE
Long Valley 13	ACTIVE
Long Valley 14	INACTIVE
Parker Meadows	ACTIVE
Adobe (Granite Mountain)	ACTIVE
Gaspipe (Granite Mountain)	ACTIVE
”ACTIVE” leks are those where male birds have been observed during the strutting season within the last 5 years	

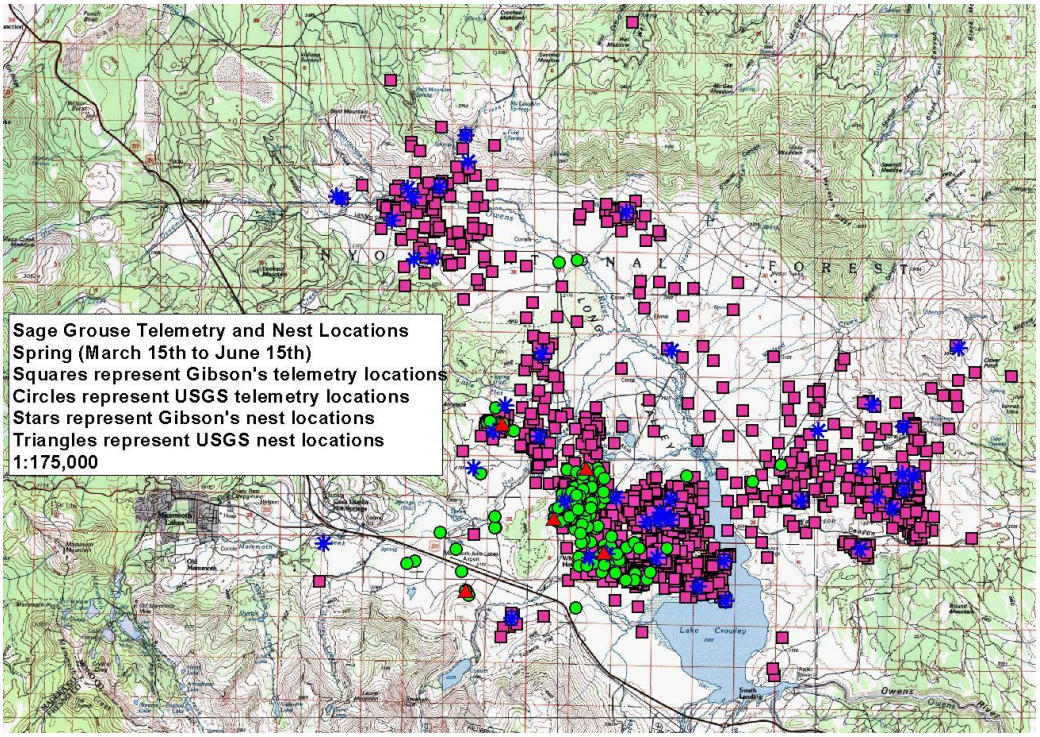
Conelly et al. (2000) suggests that for all non-migratory populations of sage-grouse, habitat within 3.2 km of known leks should be given a high priority for protection. Figure 8-3 shows 3.2 km buffers around all known leks in the South Mono PMU to provide a basis for identifying critical breeding habitat.

Figure 8.3. Active leks in the South Mono PMU with 3.2 km buffer.



Radio-marked sage-grouse in Long Valley nested in close proximity to known leks (Table 8-4). Seasonal habitat use by radio-marked sage-grouse indicates several high use areas within Long Valley during the breeding season (Gibson, unpublished data, USGS unpublished data) (Figure 8-4).

Figure 8-4. Radio-marked sage-grouse locations during Spring (March 15th to June 15th) in the Long Valley region (Gibson 1984-2000, USGS 2003 unpublished data) N=112 birds.



The following areas were of particular importance: the area northwest of Crowley Lake and South of Benton Crossing Road; northwest of Benton Crossing Road between Whitmore Hot Springs and Alkali Lakes; the north end of Hot Creek downstream of Hot Creek Gorge; both north and south of Little Hot Creek; the south slope and foot of Bald Mountain down into the north end of Long Valley especially between Clark Canyon and McLauglin Creek; near the butte 2.5 km NE of the Owens River and 2.75 km NW of O'Harrel Canyon; the Watterson Canyon area south and east of lek 10A. These are just some of the important breeding habitat use areas which are derived from radio-tracking information. Sage-grouse were not marked at all leks and we would expect that even more areas would be considered critical nesting habitat.

Table 8-4. Mean distance from nest to nearest known lek within Mono County. (Gibson, unpublished data 1984-2000, USGS unpublished data 2003).

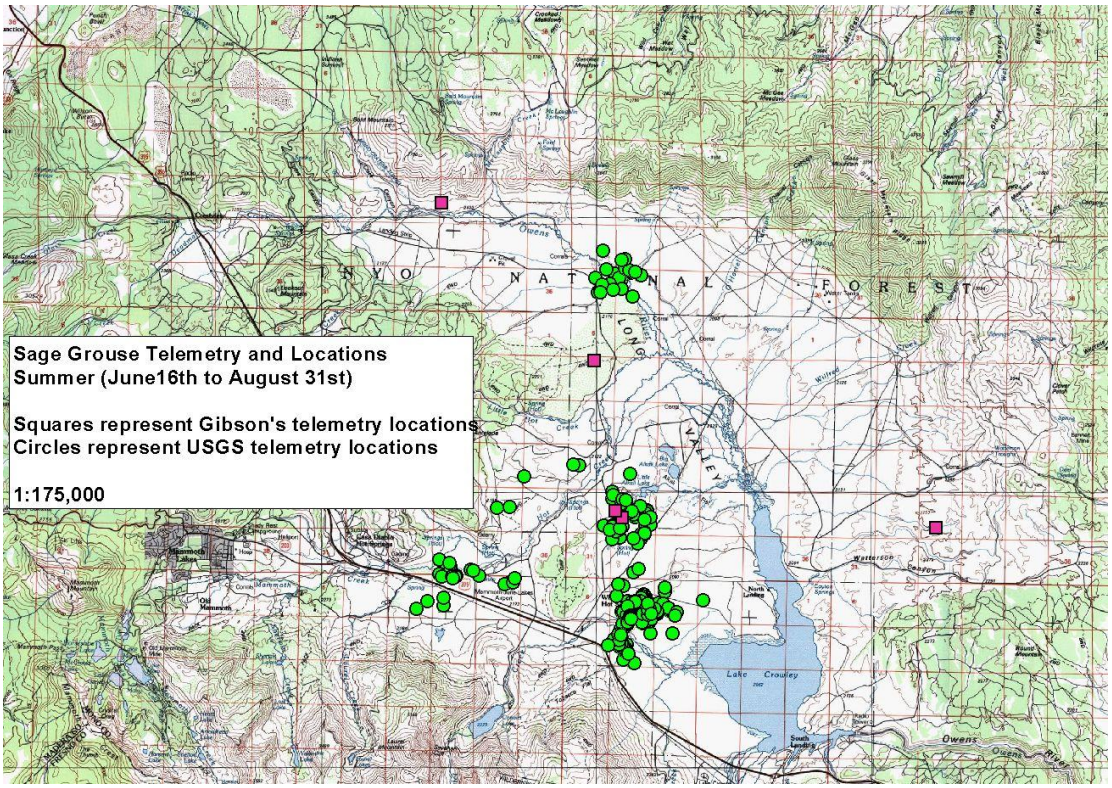
YEAR	NUMBER OBSERVED	DISTANCE TO NEAREST LEK (KM)
1984	3	3.18
1985	8	2.32
1986	11	2.92
1991	8	3.35
1993	4	2.36
1997	2	3.42
1998	6	2.63
2000	3	3.26
2003	26	1.53
Average for All Years	71	**2.38** (standard deviation = 1.77km)

Vegetation sampling conducted by the BLM in the early 1990s indicates that canopy cover within one mile of leks was within the WAFWA guidelines or 30-40 percent canopy closure. They also sampled areas 1-2 miles from the known leks in the area and found that canopy closure again was in the range of the guidelines or 20-50 percent. The grass component of the vegetation sampling did not meet objectives in the guidelines, with the grass spacing less than objectives, however, this may be due to a variety of factors including site potential, extended drought, or grazing effects (BLM unpublished Progress Report). Vegetation data recorded at nest sites in Long Valley (n=11) indicated an average shrub canopy cover of 46% (USGS unpublished data).

8.2.2 Summer/ Late Brood Habitat

Locations of radio-marked sage-grouse during the late brood rearing and summer season are concentrated in several areas of Long Valley, although sample size is small (n=15). Sage-grouse observations during late brood rearing are shown in Figure 8-5.

Figure 8-5. Radio-marked sage-grouse locations during late brood rearing and Summer (June 16th to August 31st) in the Long Valley region (Gibson 1984-2000, USGS 2003 unpublished data) N=15 birds.

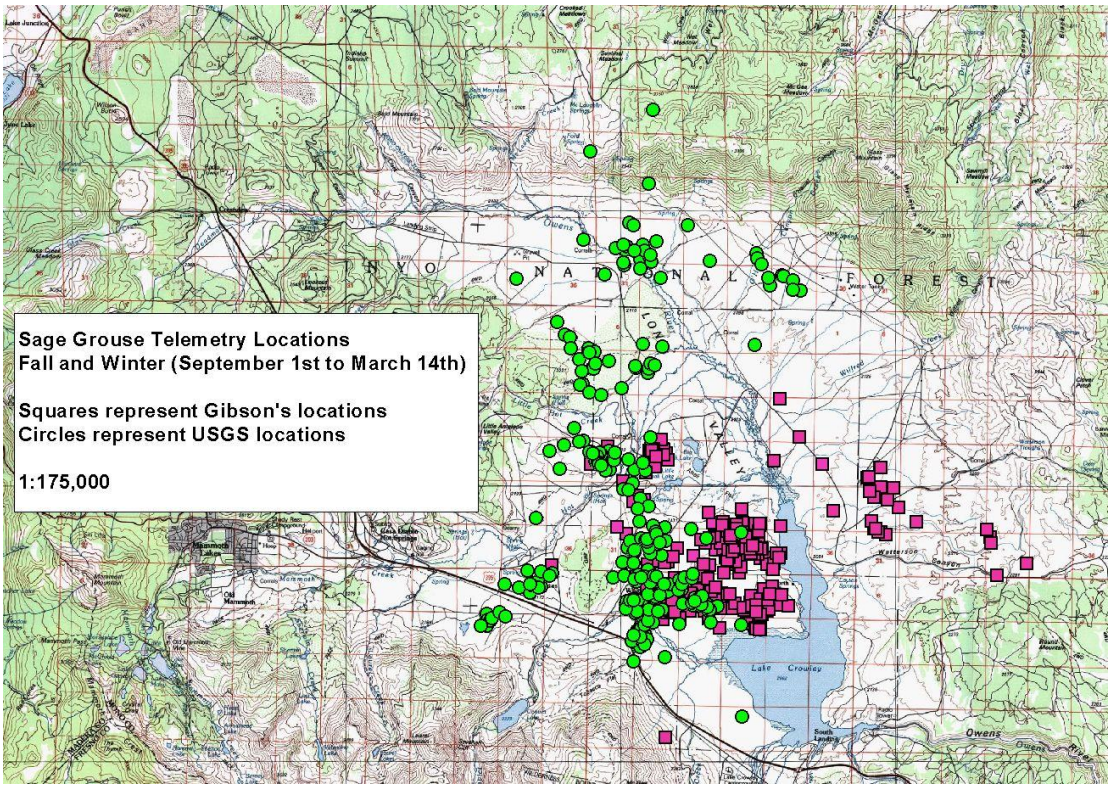


The following were highly used areas by radio-marked grouse during summer: north of Highway 395 between Mammoth Airport and the fish hatchery and west of the hatchery to Mammoth Creek; south of Highway 395 and west of Laurel Lake; between Whitmore Hot Springs and Alkali Lakes northwest of Benton Crossing Road; south of lek 5; north, east and west of lek 1; west and southwest of lek 2; Owens River 3 km upstream from confluence with Little Hot Creek at power lines; north and south of Convict Creek.

8.2.3 Winter Habitat

Fall and winter sage-grouse use areas within Long Valley derived from radio telemetry studies are depicted in Figure 8-6.

Figure 8-6. Radio-marked sage-grouse locations during Fall and Winter (September 1-March 15) in the Long Valley region (Gibson 1984-2000, USGS 2003 unpublished data) N=49 birds.



The following areas were used extensively by radio-marked grouse over the fall and winter periods: near Benton Crossing Road, north of lek 2 and east and west of leks 3 and 3A; between lek 4 and 4A, north of Benton Crossing Road; between Whitmore Hot Spring and Alkali Lakes; north of Little Hot Creek about 4km west of the confluence with the Owens River; the Owens river area about 4km linear upstream of confluence with Little Hot Creek (near power lines); southeast of O'Harrel Creek; Hot Creek downstream of Hot Creek Gorge; between the Mono Airport and Hatchery north of Highway 395; and east of Laurel Ponds south of Highway 395.

Winter habitat in the Long Valley portion of the PMU likely consists of the mountain big sagebrush and Wyoming sagebrush areas throughout the valley. Extremely deep snow may drive sage-grouse out of the valley in some years. During winters of heavy snowfall in Long Valley sage-grouse have been observed east of the Benton Range, and in Adobe Valley in unexpected numbers. Sage-grouse in the Parker Meadows area were observed on the east side of Highway 395 during much of the winter in 2003 in the area just west of the Mono Craters.

8.3 Sage-grouse Population

8.3.1 Historical Distribution

Sage-grouse were likely distributed in many of the same areas where they are found today. Little information exists on the detailed distribution and relative population size of sage-grouse in this PMU prior to lek counts which began (recorded data) in 1953.

8.3.2 Current Distribution

Annually, the Department of Fish and Game, Bureau of Land Management and other resource agencies assess the status of sage-grouse breeding populations in Mono County, California, by surveying all known leks for activity, searching for new leks, and obtaining peak counts of the number of males attending each known lek. Three apparently distinct breeding populations have been identified within the South Mono PMU, including Long Valley, Parker and Granite Mountain. Long-term lek data for Long Valley are available annually from 1953 through the present. For Granite Mountain, lek counts were first conducted in1984, and data have been collected annually since that time. Lek data for the Parker population extend back only as late as 2002 when formal counts were first conducted.

Beginning in 1987, the method for conducting lek counts in Mono County was standardized in an attempt to obtain the annual peak high male count for all known active leks in the Long Valley and Granite Mountain portions of the PMU. Annual monitoring efforts prior to 1987 did not always involve multiple lek counts because of problems associated with personnel and weather constraints. The method used to establish the peak single day count typically involved 1 experienced person counting at each lek on at least 3 separate days conducted during the period when female and male presence was at a maximum (Connelly et al. 2003). The peak single day count was taken on the day with the highest cumulative number of males counted on all leks visited within the PMU. Leks were monitored for activity from early March to judge the likely period of peak lek occupation.

The Long Valley breeding population occurs in the southern portion of the PMU, generally within the area known as Long Valley. Long Valley is an east-west oriented caldera situated between the Glass Mountain range on the north and the Sierra Nevada on the south (see Section _____ for a complete description of location and habitats within the PMU). It is located approximately 30 miles (48 km) north of Bishop and 5 miles (8 km) east of Mammoth Lakes. Major land marks within the Long Valley portion of the PMU include the Owens River, Hot Creek, Crowley Lake and Little Antelope Valley. Land within the PMU is administered by the U.S. Forest Service (USFS), Inyo National Forest, Mammoth Ranger District; the Bureau of Land of Management (BLM), Bishop Field Office; the Los Angeles Department of Water and Power (LADWP); and numerous private individuals. To date, a total of 14 strutting grounds have been identified in the Long Valley breeding complex. Of these, a total of 6 are dependable, long-term leks. Initial population monitoring efforts in Long Valley began in 1953 with the counting of just 1 lek. In 1956, another large lek (# 2) was added to the survey, followed by 5 more leks (#'s 3a, 4, 5, 6 and 7) in 1957. In 1960, two large leks (#'s 8 and 9) were discovered. Lek 10a was added to the survey in 1973 followed by leks 11 and 12 in 1979 and lek 13 in 1981. A final lek, #14, was discovered and added to the survey in 1989.

The Parker breeding population is located in the extreme northwest portion of the PMU in vicinity of the north June Lake Loop, around Grant Lake and Parker Creek, and the southern

half of the Mono Basin. It is located approximately 10 miles (16 km) north of June Lake and 6 miles (9.6 km) south of Lee Vining. CDFG file information indicates that biologists were aware of strutting activity in the Parker Meadows as early as 1953. However, because the Parker population provided little in the way of hunting opportunity when compared with the Long Valley and Bodie Hills segments, formal lek counts were not conducted. As a result, long term lek data for determining trend is not available for the Parker breeding population. Beginning in 2002, a heightened awareness regarding the questionable status of sage-grouse in Mono county, lead to increased monitoring of known lek sites and increased efforts to identify new grounds. According to CDFG file information, only two years of lek data (2002 and 2003) exist for the Parker breeding complex where a total of 3 strutting areas have been identified. Of these 3 sites, only one of the grounds appears to be a dependable, long term lek based on the number of breeding males counted there in the past two years.

The Granite Mountain breeding complex is located south of Mono Lake along the northern flank of the Glass Mountain range, from Big Sand Flat east to Adobe Valley. To date, two lek sites, Adobe and Gaspipe, have been identified in the Granite Mountain area. Adobe Lek, the easternmost site, has been monitored annually since 1984. Gaspipe Lek, discovered in 1990, has been monitored annually since that time. An historic lek in Big Sand Flat has not been active in recent years. Although the Granite Mountain area is treated as a breeding complex for the purpose of this discussion, it is unknown whether sage-grouse using Adobe and Gaspipe Leks interact with each other and/or with the Long Valley, Parker or Bodie Hills populations. There is some evidence that Adobe Valley is used by sage-grouse from Long Valley during winters of heavy snowfall. The wintering area identified in 2003 for Parker Meadows sage-grouse is very near the area known to be used by Gaspipe sage-grouse in the spring.

Population Estimates

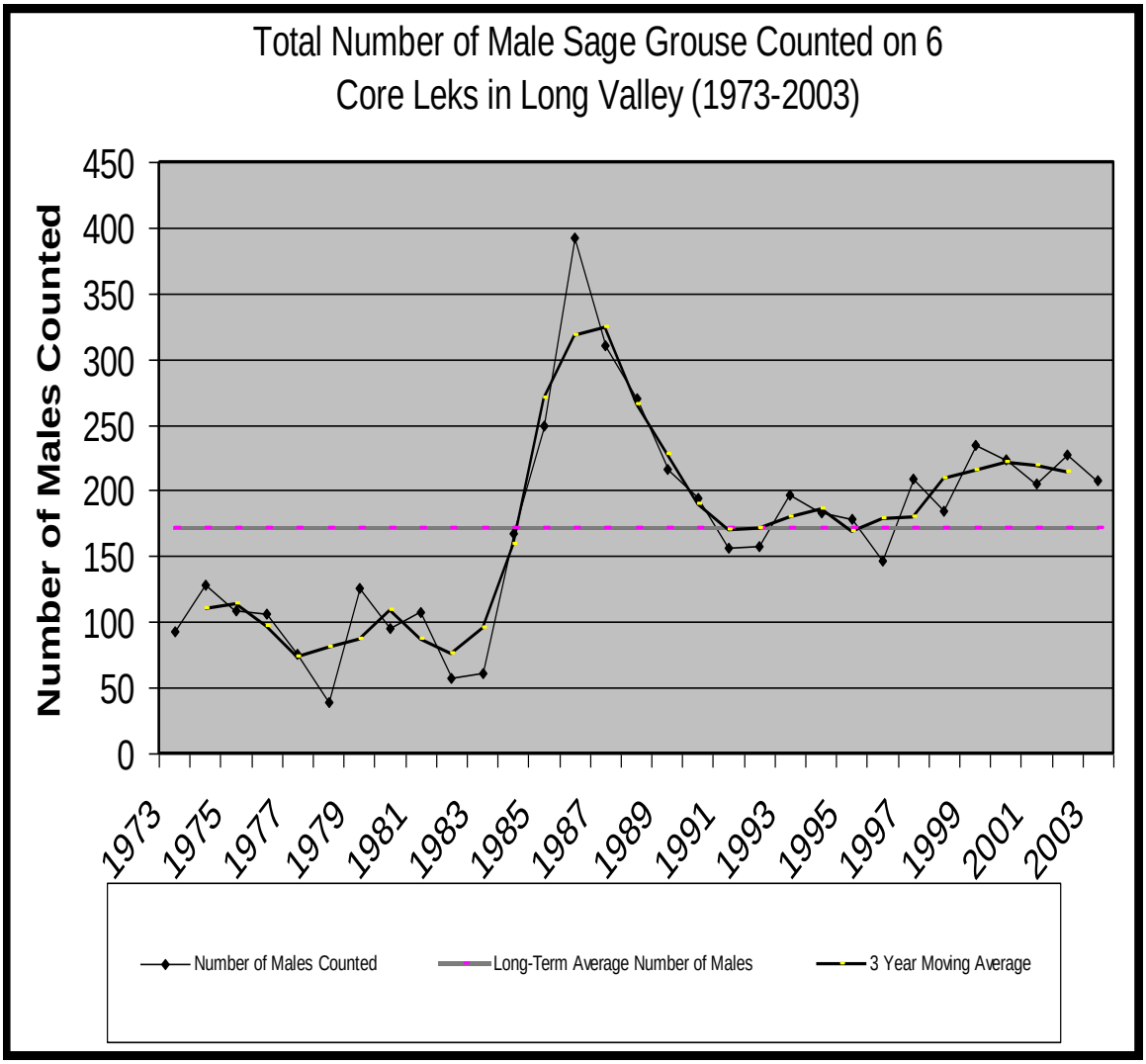
Two population expansion estimators, Emmons and Braun (1984) and Walsh (2002), were used to estimate the upper and lower limits of the most recent spring sage-grouse population in the South Mono PMU. The low estimate (Emmons and Braun 1984) assumes that there are 2.00 hens per male, while the number of undetected males (adult males not attending leks and immature males) is 25% that of visible males. The high estimate (Walsh 2002) assumes that only 50% of all males attend leks and that there are 2.73 hens per male. The assumption that 10% of all leks in the PMU are still undetected was applied to both estimators.

Based upon the average of peak lek counts conducted from 2001-2003, the most recent spring population estimate for the Long Valley was between 1,015 and 1,515 grouse. For Parker, the most recent spring population estimate, based on only two years of available data, was between 71 and 106 grouse. For Granite Mountain, the most recent spring population estimate based on the last three years of data was between 39 and 58 grouse. Thus, cumulatively, these three subpopulations comprise a current spring population estimate of between 1,125 and 1,680 grouse in the South Mono PMU. Of these, approximately 90% occur within the Long Valley breeding complex.

Long Valley Population Trend. Six core leks (1, 2, 4, 8, 9 and 10a) were used to assess the long term breeding population trend in Long Valley from 1973 to the present. These six leks were used for establishing long term trend because they have 1) been counted by sage-grouse managers on a consistent basis since 1973, and 2) functioned as core leks combining to average 87% of all breeding males counted annually in the Long Valley

breeding complex. The highest total number of strutting males observed on the 6 core leks combined, for years in which adequate sample size was obtained, was 363 grouse in 1986 (Figure 8.3.1). Since 1973, the average number of males, hereafter referred to as the long term average, counted on the 6 core leks combined was 171 grouse (Figure 8-7).

Figure 8-7. Total Number of Male Sage-Grouse Counted on Six Core Leks in Long Valley (1973-2003).



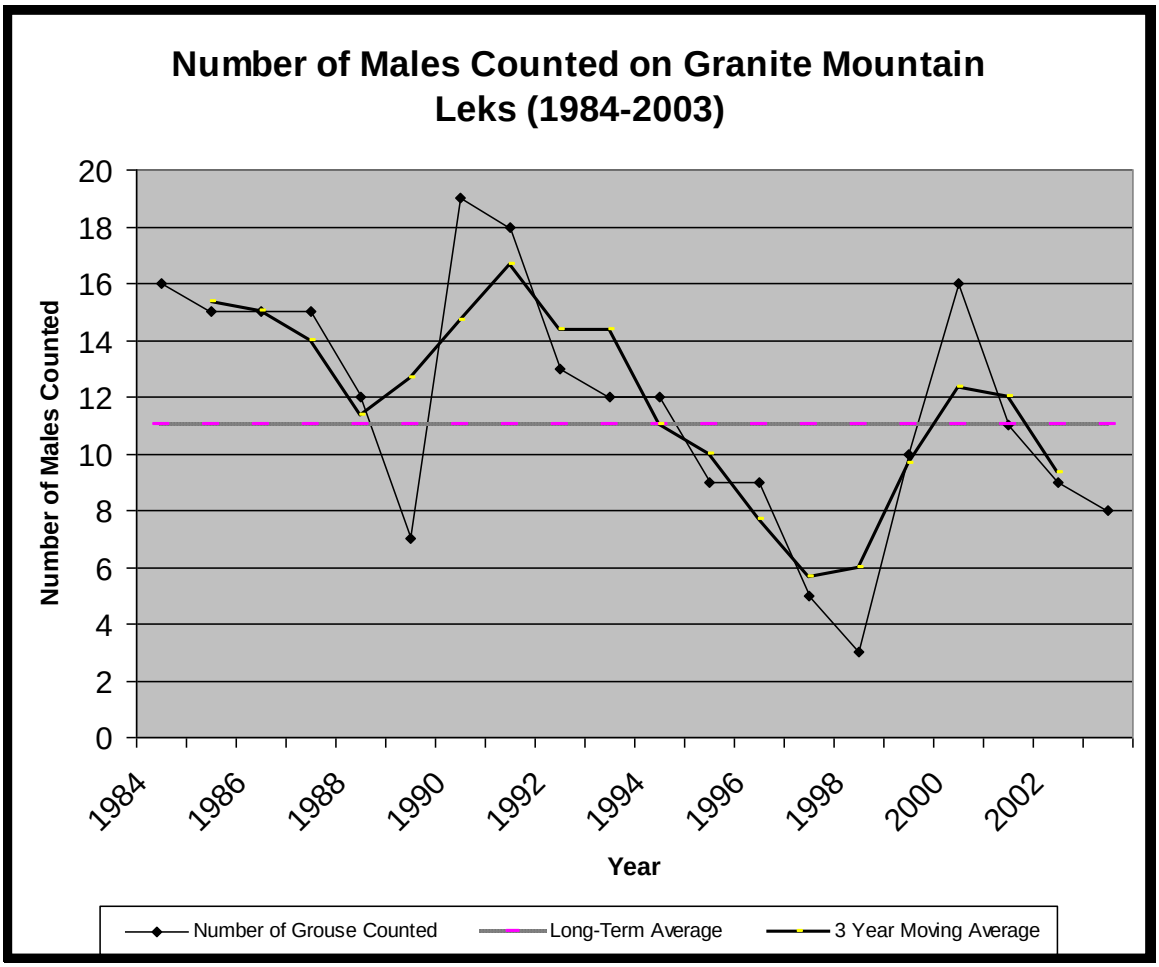
The long term trend in breeding population for Long Valley was evaluated from 1973 to the present for the 6 cores leks using a three year moving average, where each year is an average of that year and the year before and after. This trend was marked by several distinct changes in spring population, which appear related to changes associated with fall sage-grouse hunting regulations in Mono County (Figure 8.6). From 1973-1983, three year averages for the number of males counted on core leks ranged from 43 percent to 67 percent of the long term average (Figure 8.6). This low trend in population coincided with a period from 1970-1982 when licensed sage-grouse hunting occurred annually in Mono County.

Granite Mountain Population Trend. Only two active leks, Gaspipe and Adobe, are known within the Granite Mountain area. Although Granite Mountain is within the boundaries of the South Mono hunt zone, hunting pressure is thought to be relatively light due to the area's remote location and small population size. Survey data from Adobe Lek

have been collected continuously since 1984, while data from Gaspipe Lek have been collected since 1990. The high peak male count for both leks combined was 19 grouse in 1990, while the low was just 3 grouse in 1998 (Figure 8.7). The long-term average for the 20 years of existing data was 11 males. The long-term average might be higher if pre-1990 data were known for Gaspipe Lek, as high counts for Adobe Lek were in the mid 1980s.

The long term trend in breeding population for Granite Mountain was evaluated for the period from 1984-2003. From 1984-1993, the 3 year trend in population ranged from 130 percent to 150 percent of the 20 year average (Figure 8.7). This trend declined from 1994-1999, when 3-year averages ranged from 50%-100% of the long-term average. The current trend in population has declined to approximately 20% below the long-term average (Figure 8-8).

Figure 8-8. Number of Males Counted on Granite Mountain Leks (1984-2003).



Parker Population Trend. Although CDFG has known about the presence of the Parker breeding complex since 1953, lek data are only available from 2002 and 2003 when formal surveys were first initiated. The peak single day male count at Parker was 17 grouse in both of these years.

8.4 South Mono PMU Risk Assessment and Conservation Actions

Existing and potential risks for the South Mono PMU include grazing management, recreation, hunting, poaching, landfill, predation, wild horses, fences and transmission lines, fire/fire suppression/controlled burns, pinyon-juniper encroachment, water management, urbanization/changing land use, mining/geothermal development, succession – habitat degradation, cheatgrass / invasive exotic plants, road kill hazards, scientific study, herbicides, and lack of information. Some of the most critical risk factors are discussed in detail below.

8.4.1 Pinyon-Juniper Encroachment

Pinyon-juniper (PJ) encroachment is occurring in portions of the PMU. PJ habitats run primarily from the Northern part of the PMU along the Nevada/California border from the eastern part of the Mono Valley through the Inyo National Forest from Deep Wells to the Adobe Hills. The PJ habitats skirts around Adobe Valley and runs south along the Benton Range. There are also smaller pockets of PJ in the northern part of Long Valley. Pinyon-juniper can provide additional nesting and perching habitat for predatory birds such as ravens that prey on sage-grouse chicks, particularly during the early brood stage. The replacement of sagebrush range sites with pinyon juniper-woodlands is fragmenting the sagebrush habitats and diminishing habitat connectivity.

The risks from pinyon-juniper encroachment are manageable and predictable, but potentially expensive to mitigate. Climate change may have a significant impact on the speed and extent of pinyon/juniper encroachment on sagebrush habitats (Trimble 1989).

The impacts can become permanent and irreversible without appropriate management. If pinyon-juniper encroachment is not managed in these areas, a permanent change of the site potential can occur that would alter plant successional pathways and preclude the natural recovery of the sagebrush ecosystem. If sagebrush and its associated herbaceous understory are replaced, recovery of sagebrush sites to desirable sage-grouse habitat will require significant human intervention and expense.

Additional Data Needs to Verify and Further Characterize the Risk:

- On-site inventories are needed to rank the “stage” of encroachment and identify sites with the highest potential for recovery if trees are removed.
- Monitoring bird movements with radio telemetry is needed to verify population distribution patterns in relation to habitat connectivity.
- Identify critical habitat areas with pinyon-juniper encroachment for potential treatment.

Initial Conservation Strategy:

Identify quality sagebrush habitats adjacent to sage-grouse use areas where young PJ trees are becoming established for the initial PJ control projects. The PJ density should be low (10%) to maximize success. Photo points should be established for long term monitoring.

Review the WAFWA Guidelines and consult with local range ecologists to determine the criteria for site selection and the appropriate size of the treatment area.

Conservation Action: Pinyon Juniper Reduction

Risk: Loss of sagebrush habitat in the South Mono PMU due to encroachment of pinyon-juniper.

Objective: Remove pinyon-juniper overstory where it is encroaching into sagebrush habitat adjacent to sage-grouse seasonal use areas.

Action: Remove pinyon-juniper overstory by organizing and directing Christmas tree and firewood cutting in areas identified by PMU working group.

Rationale: Areas to be identified by the PMU working group will have the greatest potential to return to good quality sage-grouse habitat once pinyon and juniper are removed.

Legal Authority: Projects addressing this risk are within the management responsibility of the Inyo National Forest and the BLM.

Procedural Requirements: Projects addressing this risk are within the management responsibility of the Inyo National Forest and the BLM.

Level of Partnership Commitment: Both USFS and BLM plan to continue to work closely with local groups to allow Christmas tree cutting in areas identified as key PJ thinning areas.

Funding Source: Quail Unlimited is a proposed partner in this project. The National Forest and BLM will use volunteers to oversee the project.

Implementation Process:

1. Project Planning: Forest Service and BLM (2004):
    a. Identify action locations.
    b. Enter into budget planning.
    c. Identify Proposed Action for treatment
    d. Schedule Heritage and Biological surveys
    e. Complete Environmental Analysis.
2. Project Implementation Forest Service and BLM (2005):
    a. Budget for project
    b. Budget for Partners
3. Project Monitoring: Forest Service and BLM (2005-2006):
    a. Forest Service and BLM monitor implementation for consistency with the proposed action. Monitor change in percent canopy cover of pinyon-juniper before treatment and one year after treatment. Complete additional treatment required to accomplish the project proposal.
    b. California Department of Fish and Game along with BLM, USFS, and USGS continue monitoring sage-grouse populations through lek counts for changes in numbers of males visiting leks and through radio telemetry monitoring of sage-grouse.
    c. Report accomplishment to USFWS, Reno Office.

8.4.2 Urbanization/Changing Land Use

Although private lands comprise only a small amount of this PMU, the impacts from these lands can be far reaching. In addition, expansion of existing infrastructure within the PMU such as the proposed Mammoth Airport expansion could increase potential conflicts between urbanization and sage-grouse habitats within the PMU.

Additional Data Needs to Verify and Further Characterize the Risk:

- Identify current zoning ordinances on private lands within the PMU.
- Develop a map of private lands areas with critical habitat concerns.

Initial Conservation Strategy:

- Establish partnerships with private landowners and determine their interest in conservation planning and federal conservation incentive programs for private lands.
- Provide habitat assessments on private land to identify management opportunities for sage-grouse.
- Support zoning that will maintain, enhance, or preserve critical sage-grouse habitat.
- Identify, propose, and initiate land acquisition and conservation easement opportunities for important seasonal sage-grouse habitats under current/future threat of development.

8.4.3 Fences/Transmission Lines

Construction of transmission lines, roads, airstrips, and fences are risks to sage-grouse in the South Mono PMU that affect habitat quantity and populations on a yearlong basis. Breeding habitats, brood habitats, and migratory habitat can be impacted. Transmission lines provide perches for predatory birds. Sage-grouse mortality caused by direct impacts to fences has been documented in the South Mono PMU. Lek numbers 13, 7, and 14 are in close proximity to transmission lines. A transmission line from Little Antelope area to the Glass Mountains goes through a lek area, brooding, nesting, and wintering habitats. A sage-grouse use area on the south side of Highway 395 is being impacted by a transmission line. A local transmission line on Benton Crossing Road is potentially impacting sage-grouse in the area. Future geothermal development near Mammoth may expand transmission line corridors.

New developments that pose this type risk are being managed on federal lands in conjunction with the National Environmental Policy Act (NEPA) process, and on private lands in California in accordance with the California Environmental Quality Act (CEQA). This risk has the potential to affect breeding, nesting, and roosting habitats. This risk could also affect the connectivity of the habitat for sage-grouse movements.

Factors that modify the risk include snow cover, brush height, design of both fence and transmission line structures, location of structures, habitat type, land ownership, competing land uses, bird behavior, and adjacent land uses. Fences are a valuable rangeland management tool. Mitigation of potential impacts to sage-grouse caused by fences includes their design (such as let down fences) and placement.

Raptor perch inhibitors are being used on some transmission line poles within the PMU. However, these perch inhibitors are only on the insulators and not on the center of the poles.

Additional Data Needs to Verify and Further Characterize the Risk:

- Research current and future planning/project documents in regard to new fencing or transmission lines.
- Map the current extent of fences and transmission lines within the South Mono PMU and identify the type of fence and power line/pole construction.
- Conduct radio telemetry monitoring of sage-grouse to determine seasonal movements and to facilitate identifying the causes of mortality to telemetered birds. Use this information to identify potential conflict areas such as specific transmission lines that are being used as perch/hunt areas by raptors, and to fences that bisect sage-grouse movement corridors and are causing direct mortality of sage-grouse. This risk is manageable and predictable and can be either inexpensive or expensive to mitigate.
- Determine the seasonal peaks of raptor predation.

Initial Conservation Strategy:

- Work with land management agencies and land owners to mark new fences, install let down fences or relocate fence construction away from critical habitat areas.
- Maintain existing corridors for power lines and transportation routes. Locate new utility corridors away from critical sage-grouse habitat.
- Modify aerial structures to prevent avian predator perching or nesting. Work with transmission line companies to modify or add raptor perch inhibitors in critical areas.
- The let down fence adjacent to lek 2 is working. Extend a portion of that fence line to further reduce mortalities.

8.4.4 Recreational Activities

Risks to sage-grouse populations in the South Mono PMU from recreational activities are affecting multiple birds on multiple sites year round, but especially during the breeding and nesting seasons. Some critical sage-grouse habitats in the South Mono PMU are accessible for public recreation year round. This risk potentially affects sage-grouse habitat quality and quantity as well as the population. The timing of the recreational activities coincides with the July 4th trout fishing opener, deer season (fall season), and during the month of May when the Mammoth motocross event occurs. The motocross event requires a USFS permit. This risk is manageable but sufficient effort is required to mitigate potential impacts via policy, permit recommendations, and enforcement.

Factors that may modify the risk include the likelihood of increased urbanization and visitation to the area, the increase in special events, and any significant changes in timing of events. Other factors that may modify this risk are weather, habitat quality, sage-grouse population levels, and wild horse population levels. Managers will have to be alert to the

possibility of increases in public use in some areas following restricted public use in other areas.

This risk of 'recreational activities' has been documented by the observation of all night activities, observations of angler and hunter camping adjacent to key sage-grouse habitats during sensitive periods in sage-grouse life history, strutting sage-grouse observed flushing when approached by large groups of people, and the direct observation of dog training activities within the PMU. Also, the PMU group members have in general observed an increase in human presence in the Crowley Lake and Long Valley area over time.

Additional Data Needs to Verify and Further Characterize the Risk:

- Identify seasonal use areas by sage-grouse in the South Mono PMU by radio telemetry and use this information to evaluate potential recreational impacts to sage-grouse and their habitat. Using radio telemetry monitoring, evaluate the relationship between nest abandonment incidents and recreational activities; between snowmobile use and winter sage-grouse use areas; and between fishing activities and sage-grouse use areas.

- Obtain and deploy trail counters, and evaluate data obtained by them.

- Evaluate recreational activities that may modify habitat, such as hot tub users modifying channels, and OHV off-trail riding.

Initial Conservation Strategy:

- Limit public access to lek sites during the breeding season.

- Establish wildlife-viewing points for the public at safe distances from the leks and develop educational programs and materials to inform people about the problems caused by human disturbance. Coordinate educational activities through Bird Chautauqua, Audubon, and other conservation groups.

- Limit the use of snowmobiles and discourage other winter recreation activity within critical winter habitats.

- Deploy trail counters, analyze data and adjust trail use (closures, reroutes) as needed to minimize disturbance to sage-grouse if activities are determined to be impacting sage-grouse population stability.

- CDFG coordinate with local land management agency biologists when evaluating special use permits (motocross, special hunts, dog training) to ensure that best available information is used when developing special conditions for the permits.

- Request increased law enforcement activities at specific times/events to insure regulations/permit requirements are followed.

- Close redundant roads.

- Establish a threshold of recreational disturbance that will trigger specific emergency actions.

8.4.5 Predation

Predation on sage-grouse is a threat to the population that is affected by many conditions including availability of other prey species, habitat condition, and climate. The range and size of predator populations can be expanded by human activities such as road and fence construction, landfills, and housing development. Predator densities can also increase with the number and availability of prey species. However, predation pressure may vary unpredictably with predator density. Management of predatory species is possible and has been performed in the past. Active predator control should be considered a last resort conservation strategy and performed by Wildlife Services of the Animal, Plant and Health Inspection Service within the Department of Agriculture. Free-roaming domestic animals (e.g. cats or dogs) represent an additional predation risk. Enforcement of leash laws is under the jurisdiction of Mono County. Facilitation of predation by raptors through the presence of utility poles and transmission lines is another predatory risk and addressed separately.

Additional Data Needs to Verify and Further Characterize the Risk:

- Through radio telemetry monitoring, evaluate sage-grouse mortality rates and causes.
- Evaluate raven and gull populations associated with local landfills or refuse exchange centers.
- Evaluate the effects of active predator control on population dynamics of sage-grouse.

Initial Conservation Strategy:

- Educate private landowners to reduce predation by domestic pets.
- Provide optimal habitat of sage-grouse for all seasons to minimize predation.
- Reduce raven and gull populations associated with local landfills or refuse exchange centers via prudent refuse management practices or propose to move refuse site.
- Avoid routing overhead transmission lines through critical habitat (e.g. leks, brood rearing areas).

8.4.6 Sport Hunting

Sport hunting is the physical act of removing individual birds from the population during a regulated season and by regulated methods of take (shotgun, archery, falconry). However, hunting seasons are only scheduled when specific population criteria are met. Sport hunting of sage-grouse occurs within the South Mono PMU within a designated hunting zone called the South Mono/Inyo Hunt Zone. This zone is illustrated in the genetic sampling area map in Chapter 2. This hunt zone includes portions of Mono and Inyo counties. A portion of the hunt zone is closed to hunting in order to reduce take of adult hens that often use the meadow area adjacent to lek #2 during the late summer and early fall season. The hunting season for sage-grouse in the South Mono PMU is a two day permit only hunt. Permit numbers are based upon population levels and are adjusted annually as necessary.

From 1984-1987, the Department of Fish and Game closed all licensed sage-grouse hunting in Mono County. During this same period, the trend in population increased, reaching peak

3-year levels of 186 percent and 190 percent of long term average in 1986 and 1987, respectively (Figure 8.6). Therefore, it appears that in the decade prior to the 1984-1987 season closure, the sage-grouse population in Long Valley was approximately one-quarter of its peak unhunted density. Licensed sage-grouse hunting in Mono County was again reopened in 1987, but this time under a limited permit system. Permits were issued each season through a statewide drawing for two specific hunt areas, North Mono and South Mono. From 1987-1990, a total of 250 single bird permits were issued annually for the South Mono hunt area, which included both the Long Valley and Granite Mountain areas (Table 8-4). During this same period, the trend in breeding males steadily declined to about even with the long-term average, or about half of the unhunted density observed from 1984-1987 (Figure 8.6).

Table 8-4. Permit Numbers Authorized for the North and South Mono Hunt Areas, Inyo-Mono Counties, California, 1987-2002.

YEAR	NUMBER OF PERMITS		BAG LIMIT (PER SEASON)	SEASON DATES
	SOUTH MONO	NORTH MONO		
1987	250	300	1/1	Oct. 10-11
1988	250	300	1/1	Oct. 8-9
1989	250	300	1/1	Oct. 14-15
1990	250	300	1/1	Oct. 13-14
1991	125	450	1/1	Oct. 5-6
1992	125	450	1/1	Oct. 3-4
1993	125	300	1/1	Oct. 2-3 (falcon Oct 9-Dec 7)
1994	125	300	1/1	Oct 1-2 (falcon Oct 8-Dec 6)
1995	100	150	1/1	
1996	50	150	1/1	
1997	50	100	1/1	
1998	20	20	1/1	
1999	20	20	1/1	
2000	25	25	1/1	
2001	25	25	1/1	
2002	25	25	1/1	Sep 14-15 (falcon Oct 1- Dec 2)

From 1991-1994, the quota in the South Mono hunt zone was reduced to 125 single bird permits (Table 8.4). During this same period, the trend in population continued to hover around the long-term average (Figure 8.6). From 1996 and 1997, despite another quota reduction to 50 single bird permits (Table 8-4), the trend in population remained about even with the long-term average. Since 1998, the trend in population has stabilized at between 123 percent and 129 percent of the long-term average (Figure 8.6). This trend coincided with yet another quota reduction to 25 single bird permits in the South Mono hunt zone (Table 8-4).

CDFG's current limited-quota permit system is effective because it eliminates the potential for excessive over harvest due to weather and other influences. Additionally, the current system employs a mail-in hunter reporting system that provides wing data necessary for evaluating harvest and production trends.

Initial Conservation Strategy:

- Continue routine population monitoring to assess trends in breeding populations and annual production.

- Permit and schedule hunting seasons only when specific population criteria indicate that the population will not suffer from loss of individuals.

Conservation Action: Licensed Hunting Management

Risk: Direct mortality of sage-grouse from licensed hunting in the PMU.

Objective(s): Ensure that licensed hunting does not adversely affect sage-grouse populations in the South Mono PMU. Maintain the current conservative approach to managing sage-grouse harvest levels in the South Mono PMU.

Actions:

1. Develop and implement a comprehensive strategy for the management of licensed sage-grouse hunting in the South Mono PMU.
2. Maintain a conservative approach to managing harvest levels through the current limited-quota permit system.
3. Identify population thresholds for season closures.
4. Incorporate population trend data into permit allocation decisions.
5. Modify hunt area boundaries to more accurately reflect breeding populations or to protect sub-populations at risk.
6. Adjust season dates as necessary to moderate disproportional harvest of females and broods on water sources.
7. Improve hunter feedback requirements to facilitate data collection opportunities.
8. Coordinate and standardize harvest management strategies with NDOW to ensure that similar limited-quota harvest methods are adopted and employed within the Bi-State area.
9. Re-evaluate this Hunting Action Plan annually.

Rationale: It is important that the CDFG develop a comprehensive harvest management strategy for sage-grouse in the South Mono PMU, with criteria for making harvest management decisions based on population trend, annual hunter success, and weather influences. Additionally, the plan should specify hunter reporting requirements and how these data will be used to evaluate harvest and production trends. Most importantly, the plan should be coordinated with NDOW to ensure that similar limited-quota harvest strategies are adopted and employed throughout the Bi-State area. Finally, the plan should be reviewed an updated annually using an adaptive management approach.

Legal Authority**:** All actions addressing this risk are under the management authority of the California Department of Fish and Game.

Procedural Requirements**:** The California Department of Fish and Game will develop a formal harvest management plan for sage-grouse in the South Mono PMU.

Level of Partnership Commitment: The CDFG is committed to improving all aspects of harvest management within the South Mono PMU. The South Mono PMU Planning Group

members have expressed a clear desire to improve upon existing hunting management where possible.

Funding Source(s): The Sage-grouse Harvest Management Plan for the South Mono PMU will be developed by the California Department of Fish and Game.

Implementation Process:

1. Review existing harvest management actions and population trend information within the South Mono PMU.
2. Develop a Harvest Management Plan for the South Mono PMU.
3. Implement the Harvest Management Plan.
4. Annually review and, if necessary, update the Harvest Management Plan based on the most current population trend and hunter harvest information.

8.4.7 Poaching

Local California Department of Fish and Game Wardens and other local law enforcement offices are aware of the sage-grouse hunting season and any suspicious activity is investigated. There are no recent accounts of sage-grouse poaching within the PMU. The effectiveness of law enforcement is influenced by budgetary constraints and increased urbanization.

Additional Data Needs to Verify and Further Characterize the Risk:

- Obtain reports from Game Wardens, other patrol officers, and citation records from local courts.

Initial Conservation Strategy:

- Contact all law enforcement offices within the South Mono PMU prior to the hunting season each year and provide them with the updated regulations. Ask them to report any poaching activity to the PMU leader. Adjust strategy as needed based upon the feedback from law enforcement offices.

- Increase public awareness regarding sage-grouse conservation efforts and hunting regulations.

- Provide sage-grouse hunting regulations with X Zone deer tag packets.

- Increase penalties and limit road access.

8.4.8 Livestock Grazing

Livestock grazing occurs throughout the South Mono PMU under the authority, permitting, and management of the US Forest Service Inyo Ranger District, and the Bureau of Land Management Bishop Field Office.

Fences are an essential part of livestock grazing operations; however, the type and position of fences used in livestock operations may result in grouse mortality (See Fence/Transmission Line Risk 8.4.3).

Factors influencing the risk of livestock operations include environmental (e.g. drought, late or heavy snowfall), water use, invasive or exotic plants and adjacent land use/allotment decisions.

Additional Data Needs to Verify and Further Characterize the Risk:

- Monitor utilization or stubble height at known nesting sites prior to the nesting season.
- Monitor utilization or stubble height on late brooding habitat.
- Monitor birds movements with radio telemetry to identify nesting, early brood, and late brood habitats.
- Identify habitat used during late fall and winter, particularly during heavy snow years.
- Identify roosting sites using radio telemetry.
- Determine the site potential of nesting habitat to produce optimal habitat conditions for nesting.
- Monitor vegetation trends to determine the status of current conditions in comparison to the potential natural community (PNC).
- Inventory and conduct Proper Functioning Condition (PFC) evaluations on meadows and riparian habitats used or potentially used by sage-grouse.
- Identify irrigation patterns (when and where) and determine the process for making irrigation decisions.

Initial Conservation Strategy:

- Maintain current grazing management practices on National Forest allotments where current utilization levels are consistent with maintaining or enhancing nesting and brood habitats.
- Distribute livestock by using supplements, water distribution and fencing (preferably let-down fences) when potential habitat degradation is indicated.
- Use an adaptive management approach during drought periods to modify grazing if cover requirements for nesting are not met.
- Conduct educational workshops for livestock operators on grazing strategies and methods for maintaining or improving sage-grouse habitat.
- Coordinate management activities and communication among agencies, ranchers and researchers for clarification of problems and a more effective adaptive management approach.
- Construct exclosures on selected meadows if it is determined that complete rest from grazing would benefit sage-grouse habitat conditions.

- Maintain sage-grouse use on all currently used meadows.

- When possible, modify water sources to restore wet meadow and riparian habitats.

8.4.9 Overall Sagebrush Habitat Condition

The South Mono PMU has an impressive mosaic of sagebrush communities. Much of the habitat is in fairly good condition, with no major areas of invasive plant species. Some PJ encroachment is evident throughout the PMU but further investigation of the effect of this encroachment on sage-grouse populations is warranted before PJ management is enacted. Sagebrush is old and decadent in some areas with little desirable understory. Other factors that affect the quality of sagebrush habitats include wildfire, drought, insects, and range improvement budgets for federal land management agencies.

Additional Data Needs to Verify and Further Characterize the Risk:

- Quantify and map vegetation types to document the age and structural character of sagebrush in key areas.

- Review National Forest Management Guidelines for approved land management techniques.

- Monitor condition and trend of key sagebrush habitats in terms of sage-grouse habitat requirements.

- Conduct rangeland health assessments on key sagebrush habitats.

Initial Conservation Strategy:

- Emphasize monitoring, analysis, and management of sagebrush range sites for sage-grouse on public lands.

- Integrate specific objectives for sage-grouse habitat into land management plans.

- Conduct workshops for livestock operators and private landowners on management techniques that can be used to maintain or enhance sagebrush habitats.

- Increase fire suppression priorities in critical sagebrush habitats, particularly areas prone to cheatgrass invasion.

8.4.10 Wild Horses

Local risks to sage-grouse exist from wild horse populations primarily in the Granite Mountain area. Preferred foraging areas for wild horses are the meadows, riparian and spring-influenced areas (such as River Springs in Adobe Valley) also used by grouse during nesting and brood rearing stages, potentially resulting in habitat degradation and population disturbance. Environmental factors, such as drought or wildfire, may influence the degree of risk posed by wild horses. Mountain lion predation may influence wild horse numbers or location within the PMU.

No Herd Management Area (HMA) or related goals, or Appropriate Management Level (AML) exist for wild horses in the South Mono PMU. Wild horse management is performed under the authority of the BLM and Forest Service.

Additional Data Needs to Verify and Further Characterize the Risk:

- Evaluate wild horse population size and areas of use in relation to grouse use areas.

- Evaluate and document the impact of wild horses on nesting and brood rearing habitats of grouse.

Initial Conservation Strategy:

- The BLM and Forest Service should complete an HMA Plan with an established AML.

- Emergency plans should be adopted to gather wild horses moving out of the HMA or if population numbers increase above AML.

8.4.11 Mining/Geothermal/Energy Development

The South Mono PMU has numerous existing and potential sites for resource extraction, including but not limited to sand and gravel, hard rock mining, wind energy, and geothermal resources. The majority of these activities occur on public lands (BLM, FS, County/LADWP lands) as most of the lands (~97%) within the PMU are public lands. Risks from these activities to sage-grouse may affect habitat quality, habitat quantity and the population directly. The effects from these risks can occur at any time throughout the year, including the nesting, brood rearing, and winter season. Potential effects on habitat can occur at multiple scales and multiple sites depending on the scope and nature of the development. The effects of these types of activities on existing sage-grouse populations within this PMU could be on individual or multiple birds with the potential for cumulative effects on all birds in the PMU.

The risk to sage-grouse from mining/geothermal/energy development can occur at any time throughout the year. These types of operations have taken place in the past in varying degrees, and are now occurring at multiple sites within the PMU (geothermal energy plant, sand and gravel operations, hard rock mining, etc). These types of developments are predicted to increase in the future although there are no current hard rock, geothermal or sand and gravel applications for new development on file at this time. Some of the operations already proposed or in place are described below.

<u>1. Basalt Canyon Exploration Project Description (approved, one well already drilled)</u>

This geothermal exploration well project, termed the Basalt Canyon Exploration Project (Project), is located west of U.S. Highway 395 (US 395) and north of California Highway 203 (Highway 203), entirely on Inyo National Forest (INF) lands within the Mono-Long Valley Known Geothermal Resource Area (KGRA) (sites are on Federal Geothermal Leases CA-11667 and CA-14408, within Section 31, Township 3 South, Range 28 East (T3S, R28E), and Section 36, T3S, R27E, Mount Diablo Baseline and Meridian (MDB&M)). Mammoth Pacific, L.P. (MPLP) proposes the following activities as part of the Project: construction of two well sites (out of seven possible locations) including drilling pads and a reserved pit for the storage of waste drilling mud; the improvement or construction, as necessary, of required access roads to the two constructed well sites; the drilling (and redrilling, as may be necessary) of up to two geothermal resource exploration wells; the flow-testing of each drilled well into portable storage tanks; the flow-testing of each drilled well into the other exploration well drilled as part of this Project via a temporary pipeline laid along the access road(s); and the continued monitoring of well pressure and other data in each well. MPLP

commenced operations in the fall of 2001 and eventually completed the first of the two permitted exploration wells.

2. Basalt Canyon Pipeline Project Description (proposed and being evaluated)

The purpose of the project is to develop and produce geothermal fluid from Federal Geothermal Lease CA-14408 and deliver this fluid to the existing MPLP power plants located on private lands east of U.S. Highway 395 at Casa Diablo. These fluids are needed because the existing project wells are producing less and cooler geothermal fluid to the power plants than was the case during the first years of their operations (an expected outcome of any type of geothermal development). As a result, these two power plants currently produce less electrical energy than they were designed and permitted to produce. New replacement or "make-up" wells are needed to supply additional, hotter geothermal fluid to these power plants to increase their electrical output back up to the original design and operating capacity. The Basalt Canyon Geothermal Pipeline Project is designed to interconnect with, and supply this additional, hotter geothermal fluid to these power plants.

Five drill holes have been previously approved for the Basalt Canyon Geothermal exploration program (81-36, 12-31, 23-31, 35-31, 55-31). Two of these five drill holes will be constructed as geothermal wells. Exploration well 12-31 has been completed and a production well is planned for this site (the pipeline would extend at least as far as this site). The other production well be constructed depending on the results from exploration at the other four sites. The pipeline would connect the two production wells with the geothermal power plants located on private lands at Casa Diablo. The Project would consist of the construction and operation of up to 1.8 miles (terminating at site 81-36) of nominal 16-inch diameter insulated, welded-steel pipe, which would be constructed above ground on low piers and underground where necessary to cross under existing roads.

The precise alignment of the pipeline could vary slightly depending on final engineering and actual conditions encountered in the field. The pipeline is routed to pass by each of the five previously approved potential well sites that could supply geothermal fluid, although the pipeline would only be constructed from the western-most well to actually be connected to the pipeline. A maximum of 9,500 feet of production pipeline would be required to reach from the westernmost well site (81-36) to the interconnection point with the existing power plant production pipelines.

From the west, the pipeline route first parallels Sawmill Road on the north side, the side of the road on which four of the five potential wells are located, so that only if well 35-31 were connected to the pipeline would a short spur pipeline be needed to cross under Sawmill Road. The pipeline would be placed about 10 to 15 feet off of the edge of Sawmill Road so that the existing vegetation between the road and the pipeline would help screen the view of the pipeline from the road.

Southeast of well site 35-31 the pipeline turns east, away from Sawmill Road and towards well site 55-31. In this area the route has been selected to avoid encroaching on any of the ephemeral riparian conservation areas delineated by Inyo National Forest consistent with the direction of the Sierra Nevada Framework Plan. The route here also crosses under the existing Southern California Edison (SCE) transmission line in a manner and location that maintains SCE's existing access to the transmission line for any required maintenance.

Further east, in the vicinity of well site 55-31, the pipeline is routed through an area of vegetation mapped as Jeffrey Pine Forest where the pipeline would be hidden from view by the trees. To the extent possible, the pipeline alignment through this area will avoid existing trees. However, in those few instances were trees must be cleared, marketable logs will be disposed of according to specific instructions from the Inyo National Forest.

At the western edge of the Caltrans right-of-way (ROW) for U.S. Highway 395 the pipeline route turns southeast (between the ROW and the existing snow fence) so that the pipeline can cross under U.S. Highway 395 at right angles to the roadbed and remain on federal lands. The pipeline route in this location is well below the level of the roadbed of U.S. Highway 395 and the southbound exit ramp to California Route 203 and, thus, is hidden from the view of vehicles traveling on these roads. On the east side of the highway the pipeline route crosses under Antelope Springs Road, then parallels the east side of Antelope Springs Road southeast to Casa Diablo Cutoff Road, where it turns northeast and parallels Casa Diablo Cutoff Road to interconnect with the production well pipelines entering the power plants. All but approximately the last 400 feet of this pipeline route is located on public lands within the Inyo National Forest.

3. Upper Basalt Canyon Exploration Project Description (proposed and being evaluated)

MPLP proposes to conduct the Upper Basalt Geothermal Exploration Project (Project), consisting of two geothermal resource exploration drilling programs, on portions of Federal Geothermal Leases CA-11667, CA-11672 and CA-14407. The area to be explored, termed the Upper Basalt Geothermal Exploration Area (Project area), consists of Section 25 and portions of Section 26, Township 3 South, Range 27 East (T3S, R27E) and portions of Sections 30 and 31, T3S, R28E, Mount Diablo Baseline and Meridian. All of the lands are located within the Inyo National Forest (see Figure 3). The purpose of the proposed Project is to locate, sample, drill, test and monitor potential geothermal resource development target zones on these geothermal leases.

Nine drill sites have been proposed, with each drill site designed to explore a specific geophysical or geologic target. For the Slim Hole Exploration Program portion of the Project, MPLP proposes the construction of up to nine slim hole drill pads, each with a reserve pit for the storage of waste drilling mud, and the improvement or construction, as necessary, of required access roads; the drilling (and redrilling, as necessary) of up to nine slim holes, one each from each of the nine proposed drill sites, each to a total depth of approximately 1,500 feet (into the geothermal zone); measuring the temperature profile of each hole; bailing or flowing enough fluid from each hole to obtain a sample for water chemistry; and monitoring reservoir pressure in each hole after completion. MPLP anticipates drilling of the first slim hole to commence in the fall of 2002, or as soon as the required permits are obtained.

MPLP proposes the following activities as part of the Geothermal Well Exploration Program portion of the Project: construction of up to four well drilling pads, each with a reserve pit for the storage of waste drilling mud, on up to four of the nine proposed drill sites; the improvement or construction, as necessary, of required access roads to each of the four constructed well drilling pads; the drilling (and redrilling, as may be necessary) of up to four geothermal resource exploration wells, each to a total depth of approximately 1,500 feet (into the geothermal zone) from one of the constructed well drilling pads; the flow-testing of each drilled well into portable storage tanks; the flow-testing of each drilled well into another

drilled exploration well via a temporary pipeline laid along the access road(s); and the continued monitoring of well pressure and other data in each well.

4. Rhyolite Plateau Exploration Project Description

The proposed project is located in the Rhyolite Plateau geothermal exploration area, within existing geothermal leases, in T3S R27E, Sections 14, 15, 16, 22, and 28. In general, the area is west of U.S. Highway 395 and north of California Highway 203, north of the Town of Mammoth Lakes. The purpose of the project is to locate, sample, drill, test, and monitor potential commercial geothermal resource development target zones. The proposed activities include the construction of up to eleven slim hole drill pads approximately 120 X 120 feet, construction of up to eleven exploration well drilling pads approximately 200 X 300 feet in size, and the construction of approximately 1800 feet of temporary access roads. In addition, roads used to access the exploration well sites will require the creation and/or maintenance of an all-weather surface with a minimum road bed width of ten feet, a maximum grade of ten percent, and a turning radius of no less than 50 feet. Temporary pipelines may be used between exploration wells to conduct geothermal fluid during long-term tests associated with the exploration wells. Pipelines will be laid on the surface on the disturbed shoulders of the access roads. Fugitive dust generated during construction and travel over access roads and well sites will be minimized by watering and by limiting of vehicle speeds, as necessary.

This risk is manageable through various means although some types of operations are more manageable than others. Sand and gravel operations and geothermal resources are under greater regulation by public agencies than hard rock mining activities under current management policies. The Forest Service and BLM both have management plans in effect that consider effects of proposed mining and geothermal development on sage-grouse although the level of protection may vary between agencies. The BLM considers the sage-grouse a sensitive species in California. This designation ensures potential effects on sage-grouse populations are considered in the permitting process with respect to BLM lands. The LADWP also has a policy in place that takes into consideration the potential biological effects of proposed actions on their lands. Any action taken on their lands must comply with county ordinances as well.

Market forces are probably the most important factor which will modify this risk in the future. The price of precious minerals (gold) and the need for energy and natural resources in this region will likely have a major impact on future development of these resources. In addition, urban development may increase demand for energy or resource extraction (sand and gravel for roads, etc.) and there is a potential for increased recreational activity such as OHV use if new roads are created with any future geothermal, mining, energy developments. The current philosophy of Mono County and the city of Mammoth can modify the existing risk as well. Both groups have fairly strict regulations on any new mining activities and tend to promote very strong environmental and recreation oriented policies. A summary of the review process is given below.

Evaluation Process for Geothermal and Locatable Minerals Proposals

The analysis of the majority of geothermal or locatable mineral proposals follows the highly summarized evaluation process described below. Some prospecting or exploration proposals are limited enough not to need a lengthy project description and meet the requirements for a shorter evaluation process.

1. The proponent prepares a detailed project description and submits it to the Forest Service (or to BLM for a geothermal project on a federal lease; the Forest Service works with the BLM for geothermal projects on Forest Service administered land). The project description covers all of the activities that will occur during the life of the project, including the reclamation activities that will occur once the project operation is terminated.

2. The agency reviews the proposal for completeness and if it is incomplete asks for additional information. (The back and forth dialogue between the proponent and agency can go on for some time). This part of the process involves internal review of the project by Forest Service resource specialists. Forest Service personnel can also involve resource specialists from other agencies where appropriate. This review can also result in the Forest Service working with the proponent to reconfigure or relocate proposed operations or facilities where there are obvious and avoidable conflicts with other resources.

3. Once the Forest Service (or BLM) determines the project description is complete they work through the environmental review process, including:

    a. Public notification and receipt of comments on the proposed project.

    b. Analysis of potential impacts and documentation of the analysis in an Environmental Assessment (EA) or Environmental Impact Statement (EIS) per federal National Environmental Policy Act (NEPA) requirements.

    c. Public comment on the analysis and receipt and review of comments (which may result in additional analysis or rewriting the document).

    d. Completion of a decision on the environmental analysis, which generally includes selection of the project alternative or of a modified project alternative generated during the environmental analysis.

    e. Address appeals, if any.

4. Upon completion of the environmental review, the project as described in the selected alternative is approved.

5. The Forest Service (or the BLM for a geothermal project on a Federal lease) then oversees project operations to make sure the project is implemented as approved, including completion of reclamation activities at the end of the project life.

The first three steps in the process can take months or years to compete depending on the project complexity, location, and resources potentially impacted, and can involve consultation with numerous individuals and agencies.

Additional Data Needs to Verify and Further Characterize the Risk:

- Develop GIS layers which identify past, present, and proposed geothermal, hard rock mining, sand and gravel mining, and other energy development within the PMU.

- Initiate a study which examines the effects of current geothermal/mining/energy developments on greater sage-grouse populations within the PMU or the Bi-State region.

- Continue to gather biological data on greater sage-grouse within the PMU in order to assess potential impacts of proposed actions on current populations.

Initial Conservation Strategy:

- Incorporate conservation strategies into the respective agency management plans to ensure sage-grouse are considered when issuing land use permits, if they are not already considered.

- Examine the level of protection and consideration given to sage-grouse via the County Panning Process and work to incorporate into future guidelines.

8.4.12 Development Of Needed Data Layers To Improve Decision Making

Sage-grouse conservation must be founded on sound information and a reasonable hope that an action will have the desired impacts. Many of the risk factors identified in the South Mono PMU identify data layers that are essential for understanding and mitigating potential risks to local sage-grouse populations. Currently there are no contiguous data layers for the South Mono PMU which contain detailed landscape information for the entire PMU. Information does exist for some of the lands within the PMU but this information varies by landowner and jurisdiction. The level of information available for a variety of topics is limited to smaller parcels within the PMU, and not at the PMU scale.

Conservation Action: Development of Data Layers

Risk: This action item addresses information needs listed in several of the risk sections including PJ encroachment, geothermal risks, and urbanization.

Objective: Develop data layers which document vegetation communities, hydrologic features, geothermal areas, soil types, zoning classifications, mining and energy developments and infrastructure, and fences, roadways and power lines.

Action: Compile existing data layers for this PMU and collect new data where necessary to fill in information gaps. A project leader (a contractor or existing team member willing to fill in this role) will work with various landowners to complete each of the data layers.

Rationale: Developing the data layers would help to quantify the amount of available habitats within the PMU for seasonal use by sage-grouse. This could help to identify areas that are limited by particular habitat characteristics or areas where specific management actions could be most effective. Ongoing research into bird movements and habitat use could be combined with any or all of these data layers to aid in future decision-making processes.

Legal Authority**:** Many of these data layers can be compiled from existing information under the jurisdiction of the principal landowners primarily the US Forest Service, the BLM, and

LADWP. On the ground data gathering on private land would require the permission of the landowner.

Procedural Requirements**:** The data gathering and integration into data layers should require minimal procedural requirements. Any sensitive information incorporated into the data layers should be reviewed by the appropriate land manager.

Funding Source**:** Potential funding for the development of these data layers would likely come from the major land owners/managers in the area including USFS, BLM, and LADWP. Application has already been made for USGS funds to augment the ongoing sage-grouse research by helping to create some of these data layers.

Implementation Process: This projected could be implemented as soon as funds become available to do so.

Project Area: The South Mono PMU

8.4.13 Stakeholder Involvement

Private land and grazing allotments within the PMU provide some of the most productive habitats for brood rearing sage-grouse. These areas also include many heavily used leks, and important wintering areas. Land use decisions for these areas may have disproportionate effects on sage-grouse. Public support of management and policy decisions within the PMU is necessary for effective and continued implementation of management strategies and research efforts.

Conservation Action: Stakeholder Involvement Workshop

Risk: Multiple risks can be addressed including grazing, recreational activities, urbanization/changing land use, fences/transmission lines, and poaching. All risks directly or indirectly affect habitat quality or affect survival of individual birds.

Objective: Conduct a public meeting/workshop to facilitate information sharing with private landowners and provide an update of the current status of sage-grouse knowledge and research/management activities.

Action: Active involvement of private citizens will be encouraged through public announcements and contacting those individuals that showed previous interest in sage-grouse conservation activities. An initial meeting will be held in Mono County and include personnel from agencies responsible for management or research of sage-grouse or sage-grouse habitat. Periodic meetings will be held to ensure dissemination of relevant information, and keep interested parties informed of the current state of knowledge.

Rationale: Well-informed stakeholders can continue to work with agency personnel to develop viable conservation actions. Public education activities can foster involvement and a sense of ownership in management goals.

Legal Authority: Not applicable.

Procedural Requirements:

1. Public notice of meeting will be announced in popular media and interested parties will be contacted at least two weeks prior to scheduled workshop.
2. Prior distribution of findings and activity schedules among agencies is suggested to facilitate a comprehensive discussion.

Funding Source: Funding requirements of this action item are relatively modest. Funding is being sought by USGS personnel to facilitate additional meetings in the South Mono PMU. Funds from this grant should be available for a public information workshop. Agencies will be expected to provide travel arrangements for personnel attending the workshop.

Implementation Process:

1. Identification of issues/subjects of specific concern, interagency information dissemination (June 2004)
2. Workshop/Meeting announcement (July 2004)
3. Meeting Date (August 2004)
4. Identify future topics of discussion and plan additional meetings to satisfy public interest and/or resolve issues of contention.

Project Area Locations: Location to be determined on consensus and ability to address local needs in regions with active management or research or specific concerns.

9.0 Conservation Goals, Objectives, and Priorities

To be completed.

The following general concepts have not been finalized by the Bi-State Planning Group, and only represent some of the initial concepts that have been discussed. Further work on the Conservation Goals and Objectives is in progress.

Conservation Goals address the threats and guide the management actions at the local planning level. Conservation Objectives are specific, quantifiable objectives for each goal to measure progress toward the goal or make future changes to the goal in an adaptive management strategy.

9.1 Ensure No Net-Loss of Sage-grouse Breeding Populations within the Bi-State Planning Area.

Objective 1-1 Continue aerial surveys of leks.

Objective 1-2 Initiate aerial surveys in Inyo and Mono Counties.

9.2 Maintain and Restore (Improve) Sagebrush and Associated Habitats Critical to the Long-Term Viability of Sage-grouse Populations within the Bi-State Planning Area.

Objective 2-1 Map and identify key existing sagebrush habitats within each PMU that are not rated R0.

Objective 2-2 Based on sage-grouse use and distribution as indicated by telemetry, identify areas to treat on all seasonal ranges where habitat evaluation indicates pinyon juniper encroachment, or decadent or excessive sagebrush canopy may adversely affect sage-grouse habitat use.

Objective 2-3 Minimize the threat of catastrophic wildfire in sagebrush habitats.

Objective 2-4 After all affected interests agree that sufficient distribution data showing key seasonal sage-grouse habitats have been gathered, identify key areas for treatment to increase habitat quality and quantity within occupied sage-grouse habitats.

Objective 2-5 Review management activities that may contribute to the spread of noxious species to determine if additional management measures are necessary to minimize weed infestations and spread rate.

Objective 2-6 Compare historical pinyon juniper distribution with current pinyon juniper distribution to determine the amount of encroachment that has occurred.

9.3 Identify and Eliminate or Substantially Reduce Threats to Sage-grouse Populations and Habitats within the Bi-State Planning Area.

Objective 3-1 By 2005, determine if any fences near known occupied or potential sage-grouse habitat contribute to sage-grouse mortality directly or by providing perch sites for avian predators.

Objective 3-2 Evaluate whether or not pesticides/herbicides known to be harmful to sage-grouse are being used in or near occupied habitat.

Objective 3-3 Increase law enforcement presence in the area.

Objective 3-4 Evaluate areas for seasonal closures to known sage-grouse use areas during strutting and nesting seasons between February and May.

9.4 Identify and Implement Scientifically and Economically Sound Management Strategies Applicable to the Management of Sage-grouse Populations and Habitats within the Bi-State Planning Area.

Objective 4-1 - Increase law enforcement presence in the area.

Objective 4-2 Manage habitat in accordance with site potentials to optimize habitat characteristics as described by Connelly (2002) or locally approved standards.

Objective 4-3 Evaluate possibility of installing artificial wildlife water developments (guzzlers) in areas with limited and/or unreliable natural water sources where water is a limiting factor.

Objective 4-4 Evaluate all existing spring developments occurring in potential or occupied sage-grouse habitat. Repair or modify as necessary, in order to maintain water and riparian vegetation at the source.

9.5 Identify Important Data Gaps and Implement (Scientific) Data Collection Efforts Specific to Sage-grouse Populations and Habitats within the Bi-State Planning Area.

Objective 5-1 Investigate new potential lek sites through planned field activities.

Objective 5-2 Place radio collars on adult sage-grouse in each PMU by 2005.

Objective 5-3 Continue to identify and verify seasonal and critical sage-grouse habitats

Objective 5-4 Maintain wild horse populations at appropriate management levels in existing herd management areas.

9.6 Develop Active, Well Informed, Local Planning Groups Committed to the Development and Implementation of Sage-grouse Conservation Actions within the Bi-State Planning Area.

Objective 6-1	Continue the ongoing work of the Bi-State Local Planning Group.
Objective 6-2	Create working partnerships with non-governmental organizations, such as Deep Springs College, to assist with data collection.
Objective 6-3	Expand grant application efforts to obtain additional funding for specific conservation projects.
Objective 6-4	Create an "Adopt-a-Lek" program where an interested party or group can donate money to support sage-grouse conservation efforts.

10.0 Monitoring

To be completed.

The Bi-State Planning Group recognizes the importance of monitoring to identify successful conservation actions and measure conservation success. The Bi-State Planning Group is aware of efforts at the State level and between land management agencies to develop uniform monitoring protocols that will yield consistent, comparable results between various locations in the Nevada-California plan area. The Bi-State Planning Group anticipates completing the Monitoring section of this plan prior to the 2005 field season.

11.0 Adaptive Management

To be completed.

The Bi-State Planning Group is committed to the adaptive management approach for sage-grouse conservation. The following general approach is given as an initial step that identifies the primary concepts for adaptive management.

An Adaptive Conservation Strategy is a mechanism for sharing information and influencing policy across sites and ecosystems. Adaptive management practices are specific actions designed to reach conservation goals and evaluate policies (Elliot et al. 2003). The following information is summarized from the Adaptive Conservation Strategy Guide written by Elliot et al. in 2003 and published by the Point Reyes Bird Observatory on their website (http://www.prbo.org/cms/docs/consplans/ACSGUIDEweb.pdf).

Adaptive management practices are designed to reach specific management goals, test and evaluate management or policy actions. Results from monitoring and experimental studies are used to refine and augment Adaptive Conservation Plan management and policy recommendations. Adaptive Conservation Plans utilize existing information and desired outcomes to recommend management and policy actions. These two complimentary cycles are necessary to provide direction toward specific goals and measure progress from past to intended conditions.

Adaptive Conservation Plans will be designed to provide recommendations (if necessary) to habitat management, restoration, protection, monitoring, research design, policy and land use decisions, and education activities. Included should be a means to evaluate both financial effectiveness and ecological response to management efforts.

Both Passive (observational) and active (experimental) adaptive management practices will be employed. Passive practices, such as monitoring and observational research, provide useful foundations to suggest management activities. Active practices will allow comparisons between regions and conservation policies. The procurement of funding for long-term monitoring studies has historically been overlooked in many “adaptive management” scenarios. Long-term datasets are critical to evaluate the impacts of policies and management activities; especially for sage-grouse, whose populations have been identified as cyclic and/or highly variant (Crawford et al. 2004).

Adaptive Conservation Strategies require collaboration among all stakeholders, teamwork, keeping data current, shared information, effective communication, flexibility among partners and funding sources, and a result-oriented commitment to monitoring, research and management. The goals of an ACS are far-reaching, but can only be achieved through local projects. Cooperation, understanding and flexibility combined with standardized methodologies, and sound research design provides the foundation for an effective ACS. The Bi-State Conservation Plan allows for many of the key elements for adaptive conservation strategies to be built into the plan. The PMU groups form the local partnership necessary to implement local projects, promote communication and are committed to monitoring, research and management.

The Two Components of an Adaptive Conservation Strategy.

- Adaptive Management:

- Identify management and policy recommendations, assumptions and set specific management goals for site-specific adaptive management plans.
- Implement management actions
- Monitor and analyze response to management actions.
- Revise, Repeat and Reevaluate management actions or monitoring scheme.

- Adaptive Conservation Plans:
  - Synthesize findings from multiple adaptive management projects, as well as peer-reviewed, and gray literature to advance resource management recommendations and policy decisions.
  - Disseminate ACP recommendations via hard copy and on-line resources to partnering audiences and through outreach activities.
  - Evaluate and reassess specific management activities and ACPs
  - Repeat at appropriate timetables.

The Bi-State Planning Committee recognizes the value and benefit generated from cooperative information sharing and results-driven monitoring and research. As a consortium of interested parties and agencies, we will cooperatively participate in both recommending management and policy actions and in designing and implementing monitoring projects and research studies to address data gaps. This interactive and evolving effort will incorporate standardized survey methodologies, sound research design, and focus on addressing identified goals and information needs.

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