Massacre Population Management Unit
Population Conservation Plan

INTRODUCTION

The Massacre Sage Grouse Population Management Unit encompasses almost 2,000 square miles of sage grouse habitat in north central Washoe County. The area is bounded on the west by highway 447 and the California-Nevada state line. It is bordered on the east by the Black Rock Desert and on the north by Highway 8A and the Sheldon National Wildlife Refuge. Elevations vary from approximately 4,000 feet on the valley floors to over 9,000 feet at Granite Peak. Yearly precipitation levels vary from 8 inches in the valley floors to over 18 inches at the higher elevations. Vegetation types range from salt desert shrub communities in the dryer valley floors to aspen and mountain mahogany in the upper elevations. Overall, sagebrush is a dominant vegetation type in this PMU with low sagebrush, Wyoming big sagebrush and mountain big sagebrush occurring in similar amounts.

CONSERVATION ASSESSMENT

Sage Grouse in this population management unit occur over a large geographic area with little or no occurrence of habitat fragmentation. Over 80 percent of the land in this PMU is under federal ownership and is managed by the Bureau of Land Management. No large-scale changes in land management practices are anticipated for this PMU. A qualitative population viability analysis was done by Nevada Division of Wildlife biologists using parameters outlined in Appendix 6 of the governor's sage grouse plan. This analysis of factors in the Massacre PMU indicates a low probability of extirpation within the next 20 years.

Population estimates based on lek counts over the last ten years indicate relatively stable bird numbers with a spring breeding population of 2,000 to 3,000 sage grouse and a fall estimate of 4,000 to 6,000 birds depending on production and recruitment rates. Chronically low production rates appear to be the primary factor influencing this population. The following assessment of management risks, conservation actions and monitoring will provide NDOW and others guidance in the collection of data and management of sage grouse in this population management unit.

FACTOR: Harvest

WAFWA Guideline

Where populations are hunted, harvest rates should be 10% or less than the estimated fall population to minimize negative effects on the subsequent year's breeding population.

Risk: Over Harvest of the Population. Rated Medium.

Hunting is the most obvious direct mortality factor that people observe on sage grouse. Hunting is also one of the most manageable mortality factors. Harvest trends for the Massacre PMU have been collected from hunter bag checks and questionnaire data since the mid 1950's. During the 1960's when sage grouse were hunted separately from other species during a September season, and bag limits were very liberal, harvest levels exceeded 3,000 birds during some years with over 1,500 hunters pursuing grouse in the Massacre area. Conservative October seasons begun in 1986 have reduced both hunter participation and the total number of birds harvested. Hunter numbers have averaged 250 over the last ten years with an average harvest of 450 birds. These October seasons have produced an eighty-percent reduction in hunter numbers and birds harvested from peak years during the 1960's. Season timing and to a lesser extent changes in bag limits have been very effective tools for matching harvest rates to sage grouse population levels. Figure 1 portrays these changes in harvest rates over the last forty years.

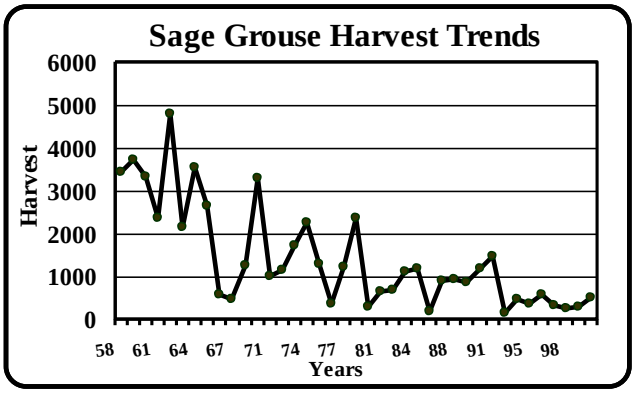

Figure 1.

Risk: Over Harvest of Females and Young. Rated Low.

Nevada studies on hunted and non-hunted areas over a four-year period were conducted in the Massacre PMU during the 1980's (Zunino 1987, Stigar 1989). Harvest rates of 25 percent were made on the hunted area, rather than the normal 7-11 percent. Based on lek counts and late summer density surveys, the number of birds increased on both the hunted and non-hunted area, but increases on the hunted area were lower than the non-hunted. These data suggest that populations are able to withstand some level of exploitation. Wing data collected during these hunts indicated that hunting birds in September produced high harvest rates on the female segment of the population. Sixty to seventy percent of the harvest during this four-year study was made up of females. Harvest ratios obtained during October seasons are generally made up of 50 percent males and 50 percent females. Delaying hunting in the fall helps to maintain low harvest rates and reduces the impact on the female segment of the population.

Risk: Over Harvest of marginal and isolated populations.

The Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU. Sage Grouse in this population management unit occur over a large geographic area with little or no occurrence of habitat fragmentation. Grouse numbers are estimated at 4,000 to 5,000 birds in the fall with birds inhabiting most of the 1,962 square miles in this PMU.

Risk: Over Harvest of genetically unique populations.

The Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU. Sage Grouse in this population management unit occur over a large geographic area with little or no occurrence of habitat fragmentation. Grouse numbers are estimated at 4,000 to 5,000 birds in the fall with birds inhabiting most of the 1,962 square miles in this PMU. Genetic mixing occurs within the Massacre PMU and also with adjacent PMU's.

Risk: No Harvest Data for Population Estimates. Rated Low.

Nest success and the recruitment of juveniles into the population is usually cited as the most significant parameter influencing the population dynamics of sage grouse. Production data is used to generate fall population estimates and is vital to understanding the status and trend of a sage grouse population. Production or recruitment can be monitored by brood counts or wing composition surveys. Brood counts are labor-intensive and usually result in inadequate sample size or miss leading information. Gathering reliable production data from brood counts over a large landmass like the Massacre PMU can be very difficult. Estimates of sage grouse nesting success and juvenile to adult hen ratios should be obtained through adequate samples of hunter harvested wings when there is no risk to the population.

Risk: Crippling Loss.

The Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU. Certainly within a hunted population crippling loss occurs. However, no data is available for the Massacre PMU to suggest that this risk is occurring at a level that is impacting population trend.

Risk: Poaching. Rated Low.

NDOW game wardens indicate that some illegal take of sage grouse occurs within the Massacre PMU. Most of this activity occurs during the late summer months when birds are closely associated with water sources and most vulnerable. Most of this take is considered to be opportunistic and no data exists that indicates organized poaching occurs within this PMU. Illegal take of sage grouse in this PMU is probably not at a level that is impacting population trend however, the population subgroup

recommends law enforcement patrols occur during late summer and fall to document any problems with illegal take.

FACTOR: Population Status and Trend

WAFWA Guideline

Routine population monitoring should be used to assess trends and identify problems for all hunted and nonhunted populations. Check stations, wing collections and questionnaires can be used to obtain harvest information. Breeding population (lek counts) and production data can be used to monitor population levels.

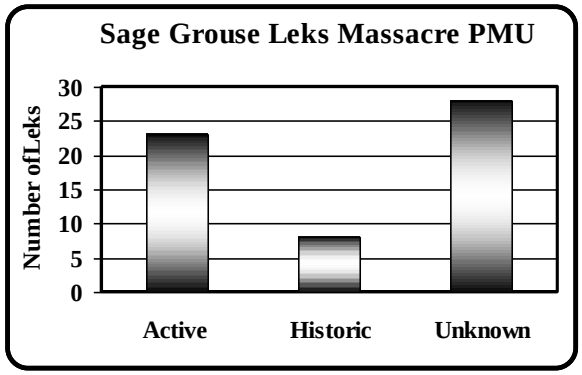

Figure 2.

Risk: Unable to Determine Trend of Population. Rated Medium.

Having reliable information to determine how many sage grouse are in a population and whether or not bird numbers are increasing, stable or declining is vital to making proper management decisions. Sage grouse can be found throughout the 1,963 square miles of the Massacre PMU. This fact coupled with the remoteness of the area and difficulty in travel complicate attempts to define populations and generate population estimates. Lek counts provide the best index to breeding populations however, lek counts done to date from the ground by both volunteers and NDOW personnel produce an incomplete picture of the population. Aerial lek surveys are the best method for obtaining information on population numbers and trend of sage grouse in this population management unit and others. However, NDOW does not conduct aerial surveys in this PMU. Budget and manpower constraints are the reasons for not conducting these surveys. Figure 2 shows the current status of leks in the Massacre PMU.

Risk: Unable to Determine Effects of Conservation Plan. Rated Medium.

Nest studies using artificially created nests to simulate sage grouse nests resulted in extremely high predator losses in the Massacre PMU and minimal losses in an Elko County location (Stigar 1989, Alstatt 1995). Ravens were the significant predators on the nests in Washoe County. Predator control was initiated beginning in the spring of 2000 within the Massacre PMU. This conservation action to increase production and recruitment should be monitored by brood counts or wing surveys.

Brood counts are labor-intensive and usually result in inadequate sample size or miss leading information. Gathering reliable production data from brood counts over a large landmass like the Massacre PMU can be very difficult. Estimates of sage grouse nesting success and juvenile to adult hen ratios should be obtained through adequate samples of hunter harvested wings when there is no risk to the population.

FACTOR: Predation

WAFWA Guideline

For small, isolated populations and declining populations, assess the impact of predation on survival and production. Predator management should be implemented only if the available data (e.g., nest success<25%, annual survival of adult hens <45%) support the action.

Risk: Excessive nest losses by avian predators. Rated Medium.

Low productivity of sage grouse in the Massacre PMU may be the result of excessive predation during nesting and or poor habitat condition. Research indicates that predation is linked to habitat conditions. Habitat risk factors in the Massacre PMU will be assessed to determine their effects on low productivity. Nest studies using artificially created nests to simulate sage grouse nests resulted in extremely high nest losses in northern Washoe County and minimal losses on the Elko County location (Stigar 1989, Alstatt 1995). Live canopy cover of shrubs and live ground cover of understory grasses and forbs were significantly more abundant on the Elko County site. Ravens were the significant predators on the nests in Washoe County.

A study of the effect of predator control on sage grouse production was initiated beginning in the spring of 2000 within the Massacre PMU in the Grassy-Stevens Camp area. The division contracted with wildlife services to conduct predator control over approximately 250 square miles with emphasis on ravens. At the conclusion of this project or at any point of the project, where data supports the implementation of predator treatments to sustain or enhance sage grouse populations, the Division of Wildlife will amend this plan and propose appropriate measures to the Wildlife Commission for support and funding.

Risk: Excessive nest losses by terrestrial mammals.

No data exists to indicate that this is occurring in the Massacre PMU. At this time the Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU.

Risk: Excessive losses on broods by avian predators.

No data exists to indicate that this is occurring in the Massacre PMU. At this time the Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU.

Risk: Excessive losses on broods by terrestrial mammals.

No data exists to indicate that this is occurring in the Massacre PMU. At this time the Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU.

Risk: Excessive losses on adults by avian predators.

No data exists to indicate that this is occurring in the Massacre PMU. At this time the Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU.

Risk: Excessive losses on adults by terrestrial mammals.

No data exists to indicate that this is occurring in the Massacre PMU. At this time the Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU.

FACTOR: Bird Health

WAFWA Guideline

Manage breeding habitats to support 15-25% canopy cover of sagebrush, perennial herbaceous cover averaging >18 cm in height with >15% canopy cover for grasses and >10% for forbs and a diversity of forbs (Barnett and Crawford 1994, Drut et al. 1994a, Apa 1998) during spring.

Risk: Low production rates caused by poor nutrition. Rated Medium.

Studies of red grouse (in Scotland) and ruffed grouse diets in relation to reproduction indicate that high quality diets result in greater production (Moss et al. 1974, 1975, Beckerton and Middleton 1982). The pre-laying period for females may also be critical to Sage Grouse populations. The nutritional and energy reserves gained in winter from a diet of sagebrush peak just prior to breeding (Beck and Braun 1978). As spring forbs begin to appear, females shift their diet to include forbs and availability of forbs with high nutritional value appear to influence the productivity of Sage Grouse hens (Barnett 1993, Barnett and Crawford 1994). The hen must consume a diet with sufficient amounts of the essential amino acids, vitamins and minerals to produce an egg and to supply that egg with all of the nutrients needed by the egg throughout the incubation

period. For optimum survival and early growth of the chicks, the hen must also provide a yolk with sufficient reserves for the newly hatched chick (Scott 1972).

Nutritional studies specific to sage grouse populations in northwestern Nevada need to be conducted to ascertain if there is a link between nutrition and poor productivity of sage grouse in the Massacre PMU. Current studies on the Sheldon National Wildlife Refuge may provide results that could be used within the Massacre PMU.

Risk: Disease related problems.

No data exists to indicate that this is occurring in the Massacre PMU. At this time the Washoe-Lassen-Modoc population subgroup did not consider this to be a risk to sage grouse in the Massacre PMU.

FACTOR: Genetics

Risk: Unique population not viable.
Risk: Unique population.
Risk: Genetic mixing.

The Washoe-Lassen-Modoc population subgroup did not consider the above to be a risks to sage grouse in the Massacre PMU. Sage Grouse in this population management unit occur over a large geographic area with little or no occurrence of habitat fragmentation. Grouse numbers are estimated at 4,000 to 5,000 birds in the fall with birds inhabiting most of the 1,962 square miles in this PMU. Genetic mixing occurs within the Massacre PMU and also with adjacent PMU's. Radio-telemetry data show movement between Sheldon and Massacre PMU's and Sheldon and Beaty□s Butte Allotment in Oregon. Recent genetic work suggests sage grouse across the range are not unique, with the possible exception of southern Nevada and California.

CONSERVATION STRATEGY

Goals:

Maintain limited harvest program to allow for recreation use and data collection at levels below population thresholds.

Generate population estimates.

Complete Wildlife Services project to determine predator impact on sage grouse population.

Complete research on Sheldon Wildlife Refuge to determine bird health

Objectives:

Keep yearly harvest levels below 10 percent of fall population estimate.

Generate yearly population estimates.

Survey and inventory leks to determine 25 trend leks by 2006.

Determine predator criteria for application of treatments by 2006.

Determine bird health and disease with blood samples by 2006.

Conservation Actions

1. The Nevada Division of Wildlife and the Nevada Wildlife Commission will utilize Season Timing, Bag limits and Permit Systems to control the harvest of sage grouse in the Massacre PMU on a biennial basis.

2. NDOW law enforcement officers will conduct patrols in the Massacre PMU to determine the extent of illegal harvest.

3. Develop population estimates for sage grouse in this PMU.

4. Research will be conducted to determine if avian predator control will improve production and recruitment rates of sage grouse in the Massacre PMU.

5. Collect wing composition data to determine production, harvest composition and fall population estimate.

6. Research on nutrition is being conducted on the Sheldon National Wildlife Refuge will be applied to management in the Massacre PMU.

Adaptive Management

NDOW will monitor sage grouse harvest in the Massacre PMU using the monitoring actions described above. If data gathered from this monitoring indicates a change is needed in the harvest program to meet WAFWA guidelines NDOW and the Wildlife Commission will use appropriate conservation actions described above to meet WAFWA guidelines.

Wildlife Services and NDOW will conduct and monitor predator control and its effects on sage grouse production in the Massacre PMU. Results from this research will be used to guide management decisions in Massacre and other PMU's.

Information gathered from nutritional studies being done on the Sheldon may be applied to the management of sage grouse in the Massacre PMU.

Lassen, Washoe and Modoc Counties Sage Grouse Plan

Prioritization Table for Massacre PMU

Risk Factors	Conservation Actions that Address Risks
High Risk	
No High Risks Identified	
Medium Risk	
Unable to Determine Population Trend	3 5
Unable to Determine Effects of Conservation Measures of Plan	3 5
Excessive nest losses by Avian Predators	4
Nutrition	6
Low Risk	
Over Harvest of Population	1 2 3 5
Over Harvest of Females and Young of Year	5
Poaching	2
No Harvest Data for Population Estimates	5

Lassen Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Conservation Actions to Address Population Risks

Conservation Action # 1

The Nevada Department of Wildlife and the Nevada Wildlife Commission will utilize season timing, bag limits and if needed permit systems to control the harvest of sage grouse in the Massacre PMU on a biennial basis.

What is the objective of this action?

Keep harvest levels below 10 percent of the fall population estimate as recommended by WAFWA guidelines.

Why is this action being conducted?

It has been determined that harvest levels above 10 percent of fall population numbers can cause additive mortality to sage grouse populations.

How will this action be carried out? Who will oversee and conduct this investigation?

NDOW will generate population estimates and collect harvest data through hunter-harvested wings and 10 percent questionnaire data. This information will be used to determine harvest percentages and make recommendations to the Nevada Wildlife Commission on season lengths, bag limits and or the need for a permit system.

Where will these actions take place?

Information will be collected and analyzed for the Massacre PMU.

When will these actions be conducted?

These investigations will be completed on both an annual and biannual basis.

How will the results be applied to future conservation actions?

Based upon the results of these investigations changes in harvest strategies will be recommended to the Nevada Wildlife Commission as needed.

Lassen Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Conservation Actions to Address Population Risks

Conservation Action # 2

Research will be conducted to determine if avian predator control will improve production and recruitment rates of sage grouse in the Massacre PMU.

What is the objective of this action?

Determine if predator removal will increase production and recruitment rates of sage grouse in the Grassy Stevens Camp area within the Massacre PMU.

Why is this action being conducted?

NDOW has determined that sage grouse nest success and chick survival within the Grassy Stevens area are below levels needed for population growth or maintenance (chick/hen ratio greater than or equal to 2.25). Chicks /Hen were estimated at 1.04 in 2001.

How will this action be carried out? Who will oversee and conduct this investigation?

Wildlife Services will place baits in the field and monitor baits during the project duration. Wildlife Services will provide the NDOW with Global Positioning System (GPS) coordinates for the locations of the treated areas. Wildlife Services will provide licensed applicators. Raven densities will be monitored during the project duration using standard survey methods. Wildlife Services will conduct a post-treatment analysis of the effectiveness of the control project. Wildlife Services will provide reports of all surveys conducted to the NDOW (*Nevada Predator Management Plan Project 1*). NDOW will determine chick/hen ratio thru the collection of hunter-harvested wings annually.

Where will these actions take place?

The project treatment was conducted in the Grassy/Hart Camp area of Washoe County with control areas on the Sheldon National Wildlife Refuge and the Lone Willow area of Humboldt County. Total size of the project area is approximately 250 square miles.

When will these actions be conducted?

These studies have been conducted for the last three years from 2000 to 2003 and are scheduled to continue through 2004. To date 86,303 dollars have been expended on this project with an average cost of 28,767 dollars per year. Money for this project has come from hunter contributions to the NDOW predator control program.

How will the results be applied to future conservation actions?

This study reflects the complexity of the predator-prey-habitat relationships that exist. Based on results to date predator control may or may not play a role in population regulation in the Grassy-Stevens Camp area. Under some conditions predation is additive and control would produce a positive response in a sage grouse population. What these conditions are still need to be determined. This study may need to be taken one step further with a greater emphasis on condition and utilization of pre-laying, nesting and early brood rearing habitat by sage grouse and other species.

Lassen Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Conservation Actions to Address Population Risks

Conservation Action # 3:

NDOW will develop population estimates for sage grouse in the Massacre PMU.

What is the objective of this action?

Use aerial survey techniques to inventory leks in the Massacre PMU and establish 25 trend leks by 2006 to be surveyed on an annual basis to generate a minimum spring breeding estimate.

Why is this action being conducted?

Current population estimates based on lek counts indicate a spring breeding population of 2,000 to 3,000 birds and a fall estimate of 4,000 to 6,000 birds depending on recruitment and production rates. These estimates are currently based on ground counts, which have been highly variable, from year to year. Accurate population estimates are necessary for harvest programs and as a reflection of habitat trends.

How will this action be carried out? Who will oversee and conduct this investigation?

The Nevada Department of Wildlife will conduct intensive aerial lek surveys using rotary aircraft to determine total active leks and the number of birds utilizing these breeding grounds. NDOW will utilize the same methodology that has been in place on the Sheldon since 1994. A minimum breeding population estimate will be established using formulas currently accepted by the scientific community.

Where are the actions going to take place?

The entire PMU will be surveyed for lek attendance. There are currently 59 leks identified within the PMU of which 16 have been identified as active, 35 as unknown, and 8 as historic. Active leks will be given first priority when surveying, unknown, and historic status leks will be surveyed if time allows. As flights are taking place, if new leks are discovered a Universal Transverse Mercator (UTM) location will be taken, a place name will be assigned, and the number of birds observed will be recorded. In addition, any substantial notes or comments will also be recorded.

When will these actions be conducted?

These surveys are scheduled for April and May 2004. Four days of aerial surveys are scheduled. Estimated costs of this project include approximately $4,000 for helicopter time, $1,500 for travel expenses and $2,400 for salaries for a total of $7,900 per year to conduct this work. The surveys will have to be conducted on an annual basis as close to the same dates as possible for each consecutive year. The surveys will be ongoing for at least the next four years.

How will the results be applied to future conservation actions?

Minimum spring population estimates will allow the NDOW and the Wildlife Commission to maintain harvest at or below 10% of the population, which meets WAFWA guidelines. These population estimates will enable State and Federal Agencies to assess population status and trend.

Lassen Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Conservation Actions to Address Population Risks

Conservation Action # 5

Nevada Department of Wildlife will collect wing composition data to determine production and harvest composition.

What is the objective of this action?

Determine the productivity levels and the sex and age of harvested sage grouse in the Massacre PMU.

Why is this action being conducted?

Productivity levels will be used to generate fall population estimates and to determine if other actions implemented within this plan are having a positive effect on recruitment rates of sage grouse in this PMU. Sex and age data will be used to determine harvest effects on specific segments of the population. Changes in season timing and or bag limits can be implemented if these data show that current harvest actions are impacting bird numbers. This action provides the best measure of population health regarding nesting success and chick survival.

How will this action be carried out? Who will oversee and conduct this investigation?

NDOW will place wing collection barrels at locations throughout the Massacre PMU. Harvested wings will be analyzed on an annual basis by NDOW biologists. Information on sex, age and production will be recorded and used to determine whether or not the conservation actions of this plan are addressing the risks outlined for the Massacre PMU.

Where will these actions take place?

Information will be analyzed for the Massacre PMU.

When will these actions be conducted?

These investigations will be completed on both an annual and biannual basis.

How will the results be applied to future conservation actions?

Results from wing composition data regarding female/male harvest, nest success and chicks per hen estimates will be compared to WAFWA guidelines where applicable. If those values are not meeting guidelines that would sustain a healthy sage grouse population, then changes in harvest strategies will be recommended to the Nevada Wildlife Commission.

Lassen Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Conservation Actions to Address Population Risks

Conservation Action # 6

Research being conducted on bird health within the Sheldon PMU will be applied to management within the Massacre PMU.

What is the objective of this action?

Utilize data from studies occurring in an adjacent PMU (Sheldon) to determine if bird health is a problem affecting sage grouse within Massacre PMU. Objectives of the ongoing work in the Sheldon include:

1. Determine relationships between condition of the hen during the pre-laying period, weight of chicks at hatching and chick survival.
2. Determine relationships between brood-rearing habitat components and habitat characteristics within cover types and chick survival.
3. Determine what factors are important in regulating chick survival and ultimately sage grouse populations by comparison of health and reproductive parameters, habitat components and chick survival rates among 3 areas within similar cover types but different management practices and levels of grouse productivity.

Why is this action being conducted?

Little is known about bird health in the Massacre PMU. If research on the Sheldon indicates that there are management actions that will improve bird health this information can be used as future conservation actions in the Massacre PMU.

How will this action be carried out? Who will oversee and conduct this investigation?

NDOW will utilize results from the Sheldon NWR as a benchmark for what is achievable in terms of grouse health in northwestern Nevada.

Where will these actions take place?

Information collected on the Sheldon may be applied to bird populations in the Massacre PMU.

When will these actions be conducted?

These investigations will be completed on an annual basis.

How will the results be applied to future conservation actions?

Based upon the results of these investigations changes in management actions will be recommended for the Massacre PMU.

Sage Grouse Habitat Management Risks, Conservation Measures, and Monitoring Actions
Massacre Population Management Unit
This Habitat Risk Assessment concerns the areas managed by the BLM's Surprise Field Office and the Winnemucca Field Office, assessed by the Massacre Habitat Subgroup

The Massacre PMU consists of approximately 1,254,564 acres of mostly uninhabited land in northern Washoe, western Humboldt, and extreme northeast Pershing Counties of Nevada. More than 90% of this area is managed by the United States Bureau of Land Management (BLM). The remainder of the area consists of scattered parcels of private land and a small amount of Bureau of Indian Affairs (BIA) managed lands (Summit Lake Reservation).

Elevations range from 4000 feet on the edges of the Black Rock Desert to more than 9000 feet at the top of Granite Peak. Annual precipitation ranges from 4 inches in the valley bottoms to more than 16 inches on the higher mountain slopes. The majority of the PMU consists of sagebrush-dominated communities, with relatively small inclusions of riparian, mountain mahogany, western juniper, aspen, and desert shrub communities throughout the area. Livestock and wild horse grazing, upland bird and big game hunting, and recreational driving, hiking, riding, and camping are the primary land uses which occur in the Massacre PMU.

The Massacre PMU provides year-round habitat for a fairly stable population of sage grouse. Sage grouse seasonal habitat types are well distributed and well connected throughout the PMU. Making major changes to existing management (livestock, wild horses, fire, recreation, mining) is a risk because we cannot be absolutely sure why the PMU is maintaining itself, or what impact major changes could have. Therefore, changes in management in the PMU should be carefully considered in terms of scale and degree of risk, and they should be initiated slowly.

Mapping

In accordance with the Nevada Governor's Sage Grouse Conservation Strategy (Goal #1, Objective #2, page 32), habitat conditions within the Surprise Field Office managed portion of the Massacre PMU was assessed and evaluated, as follows:

R0 – 480,868 acres (62% of PMU)
R1 – 28,771 acres (4% of PMU)
R2 –245,654 acres (32% of PMU)
R3 – 18,652 acres (2% of PMU)
R4 – 0 acres (0% of PMU)

Note: 1) 36,109 acres were not classified, and met no criteria for sage-grouse habitat.
2) There is a 14,000 acre difference between the overall analyzed PMU boundaries and the sum of the above R values. This is thought to be due to changes that were made in the Massacre PMU boundary during the analysis period. The relative percentage of each habitat type in the PMU should be correct.

In accordance with the Nevada Governor's Sage Grouse Conservation Strategy (Goal #1, Objective #2, page 32), habitat conditions within the Winnemucca Field Office managed portion of the Massacre PMU was assessed and evaluated, as follows:

R0 – 121,570 acres (26% of PMU)
R1 – 71,877 acres (16% of PMU)
R2 – 162,533 acres (35% of PMU)
R3 – 5,335 acres (1% of PMU)
R4 – 0 acres (0% of PMU)

Note: 1) 30,578 acres were not classified, and met no criteria for sage-grouse habitat.
2) There is a 14,000 acre difference between the overall analyzed PMU boundaries and the sum of the above R values. This is thought to be due to changes that were made in the Massacre PMU boundary during the analysis period. The relative percentage of each habitat type in the PMU should be correct.

Sage Grouse Habitat Conservation Goals

1. Promote habitat conditions that support wintering, breeding, nesting, and brood-rearing success.

2. Provide secure sage grouse winter, breeding, and nesting habitat with minimal disturbance and harassment.

3. Permit no net, long-term loss of sage grouse habitat as a result of actions authorized by federal and state agencies; minimize habitat losses resulting from natural disturbances (wild land fire, insects, disease, etc.); work with landowners to minimize habitat losses on private lands.

4. Continue existing, and initiate new, efforts to restore historical sage grouse habitat.

Factor: Habitat

Risk #1: Temporary conversion of sagebrush communities to perennial herbaceous communities

Season/Habitat affected: All

The Surprise and Winnemucca Field Offices have been keeping some record of fires in the resource area since 1949; complete records of fires have been kept since the early 1980's. Since 1949, approximately 13,102 acres are known to have burned in 21 separate incidents (12,360 acres in 13 fires since the early 1980's). This is less than 2% of the acres that occur in the Surprise and Winnemucca Field Office managed portions of the PMU. More than half of the burned acreage occurred during one incident – the Corral Fire on Boulder Mountain which burned 7,040 acres in 1996. Most fires have been caused by lightning strikes from late July to early October. Median fire size is 57 acres. Approximately 1,500 acres (10% of the total burned acres) were burned during prescribed fire or escaped prescribed fire. The heaviest concentration of lightning caused fires in the Surprise Resource Area portion of the PMU has occurred in the Hays Range and Boulder Mountain area. Within the Winnemucca Field Office there have been few fires; the latest fire was in 1999 named the Division fire that encompassed 271 acres. This area is not prone to fires within the Winnemucca portion of the Massacre PMU. Fires have occurred primarily at elevations above 5,500 feet, most often in mountain big sagebrush communities (potential sage grouse nesting and brood rearing habitat). These fires have generally returned to strong native perennial herbaceous communities following fire, and they begin to see substantial increases in sagebrush approximately 10 years following fire.

Prescribed fire continues to be recognized as a tool, particularly for restoring aspen, riparian, and high elevation big sagebrush communities to natural fire regimes (see Appendix #2, Cowhead/Massacre General Decision #15, Home Camp Allotment Management Plan, Bare Multiple Use Decision, and the Winnemucca District Fire Management Plan 1998).

One decision (Subunit #1, decision #8) places limits on heavy equipment use for wildfire suppression, in response to wilderness and primitive area objectives around High Rock Canyon. See the Draft RMP and Draft EIS for the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area (NCA) and Associated Wilderness, and other Contiguous Lands in Nevada the Sonoma/Gerlach MFP III 1982 and the Winnemucca District Fire Management Plan 1998. The Massacre PMU falls within RL3, which has agreements with the Susanville District of the BLM for lands north of Gerlach. The four wildfire rehabilitation plans (Nolan, Buzz/Black, Cottonwood, and Corral), and all prescriptive fire plans emphasize resting burned areas for a minimum of two growing seasons, with the objective of restoring native herbaceous vegetation for soil stabilization. A few of these plans also include objectives for restoring mule deer habitat by managing specifically for bitterbrush and mountain mahogany (see Corral Wildfire Rehabilitation Plan and Sonoma/Gerlach MFP III). However, mountain big

sagebrush restoration for sage grouse habitat has not been included as an objective in any of the current Activity or Land Use Plans. The vast majority of wild and prescriptive fires in the Surprise and Winnemucca Field Office managed portions of the Massacre PMU have occurred on higher elevations in which there are large blocks of mountain big sagebrush surrounding the burned areas. These blocks provide a natural seed source for sagebrush, the burned areas provide additional habitat variety for wildlife, and sagebrush recovery generally occurs naturally**.**

Contributing Management Action: Wild and/or prescribed fire or herbicide use on areas with a strong native understories.
Risk Rating: High

The risk of temporarily converting large acreages of land from sagebrush to perennial herbaceous vegetation is low in the Surprise Field Office managed portion of the Massacre PMU as well as the Winnemucca portion of the Massacre PMU. There are few natural or artificial starts, and the variety of vegetation types and topography and the amount of rock limits the size and extent of most fires. In addition, the Surprise and Winnemucca Field Offices currently follow a policy of full suppression on all wildfires, and resources are generally sufficient to begin immediate control of most fires. The risk of large fires is locally higher in the Hays Range and around Boulder Mountain, where larger areas have burned relatively recently.

The risk of temporarily converting smaller acreages of land from sagebrush to perennial/annual herbaceous vegetation is high in the Surprise and Winnemucca Field Office managed portions of the Massacre PMU. There is no active fire plan to specify areas that should be left with islands of unburned fuel. As a result, general firefighting techniques in the Surprise Field Office are standard practice, including back burning and burning out islands of unburned fuel. The Winnemucca Field Office limits back burning, and burning out islands of unburned fuel. Much of the area in the Surprise Field Office is occupied by over mature stands of big sagebrush which need disturbance to return them to productive sagebrush communities. Small-scale prescribed fire is planned for many of these stands in the higher elevations in the Surprise Field Office. Prescribed fire commonly escapes from control lines and burns additional, unplanned acres.

Conservation Measure(s): *Rehabilitate burned areas when needed. Use native seed mixture which includes sagebrush and forbs that are appropriate for the site. Emphasize full fire suppression and limit back burning and burning out islands of unburned fuel, on R-0 sites to prevent conversion to R-1 sites.*
Responsible Parties: BLM
Monitoring: *Inspect seeded areas during the first two growing seasons to ensure seed mixtures are appropriate and effective.*

Conservation Measure(s): *Keep livestock off of burned areas for a minimum of two growing seasons (rest pasture, fence burned area, or herd livestock). Develop further*

prescriptive grazing management as needed to ensure meeting both overstory and understory objectives.
Responsible Parties: BLM, livestock permittees
Monitoring: *Frequently check burned areas for livestock during the first two growing seasons following fire to ensure compliance with rest. Periodically check burned areas to ensure compliance with further grazing management prescriptions. Monitor burned area vegetation to ensure overstory and understory objectives are being met. Vegetation monitoring should include, 1) annual site inspections/photo points to confirm that native, perennial vegetation has stabilized soils and that cheatgrass and noxious weeds are not encroaching, and 2) line transects every 3-5 years to track recovery of sagebrush and herbaceous vegetation canopy cover.*

WAFWA Guidelines: (See Appendix #1). 1, 5, 6, 7, 8, 9, 11, 13, 14, 18, 19, 20, 29, 30, 31, 32, and 33.

1. ["Monitor habitat conditions and only propose treatments if warranted by range condition (i.e., the area no longer supports habitat conditions described in the following guidelines under habitat protection). Do not base land treatments on schedules, targets, or quotas "(Connelly et al. 2000).]

Surprise Field Office policy/decision: With the exception of non-native species seedings, land treatments (prescribed fire, brush reduction, juniper reduction, native seeding) are conducted for one of two reasons. Small areas around private lands, structures, and other important resource sites are treated to reduce the risk of wildfire. All remaining vegetation treatments are conducted to restore ecological site conditions. Decisions to implement vegetation treatments are made on a case-by-case basis, and not as part of schedules, targets or quotas.

Winnemucca Field Office policy/decision: With the exception of non-native species seedings, land treatments (prescribed fire, brush reduction, juniper reduction, native seeding) are conducted for one of two reasons. Small areas around private lands, structures, and other important resource sites are treated to reduce the risk of wildfire. All remaining vegetation treatments are conducted to restore ecological site conditions. Decisions to implement vegetation treatments are made on a case-by-case basis, and not as part of schedules, targets or quotas.

5. [" Manage breeding habitats to support 15-25% canopy cover of sagebrush, perennial herbaceous cover averaging >18 cm in height with >15% canopy cover for grasses and >10% for forbs and a diversity of forbs (Barnett and Crawford 1994, Drut et al. 1994a, Apa 1998) during spring (Table 3) (Appendix I). Habitats meeting these conditions should have a high priority for wildfire suppression and should not be considered for sagebrush control programs. Sagebrush and herbaceous cover should provide overhead and lateral concealment from predators. If average sagebrush height is >75 cm, herbaceous cover may need to be substantially greater than 18 cm to provide this

protection. The herbaceous height requirement may not be possible in habitats dominated by grasses that are relatively short when mature. In these cases, local biologists and range ecologists should develop height requirements that are reasonable and ecologically defensible. Cover on leks does not have to meet the above requirements (Connelly et al. 2000).]

Surprise Field Office policy/decision: With the exception of non-native species seedings, all of the lands in the Surprise Field Office managed portion of the Massacre PMU are being managed for mid-, late-, or potential natural communities, as defined by the NRCS ecological site potentials (see Cowhead/Massacre LUP; Subunit #1, decision #6; Subunit #2, decision #5; Subunit 3, decision #4; and the Tuledad/Home Camp LUP Range Management decision #1). Where mid-, late-, or potential natural community is compatible with 15-25% canopy cover of sagebrush, >15% canopy cover of grasses, and >10% canopy cover of forbs, breeding habitat will be managed to meet these cover classes. Where mid-, late-, or potential natural community should have sagebrush canopy covers in the 15-25% range, and current sagebrush canopy cover is greater than 25%, especially if sagebrush canopy cover is suppressing the herbaceous understory, management to restore appropriate sagebrush covers may require reducing sagebrush cover to less than 15% in the short term.

Winnemucca Field Office policy/decision: With the exception of non-native species seedings, all of the lands in the Winnemucca Field Office managed portion of the Massacre PMU are being managed for mid-, late-, or potential natural communities, as defined by the NRCS ecological site potentials (see Leadville Allotment FMUD 1994, Buffalo Hills FMUD 1993, Soldier Meadows Allotment FMUD1994, Coyote Allotment AMP 1973, and Sonoma/Gerlach MFP III 1982). Where mid-, late-, or potential natural community is compatible with 15-25% canopy cover of sagebrush, >15% canopy cover of grasses, and >10% canopy cover of forbs, breeding habitat will be managed to meet these cover classes. Where mid-, late-, or potential natural community should have sagebrush canopy covers in the 15-25% range, and current sagebrush canopy cover is greater than 25%, especially if sagebrush canopy cover is suppressing the herbaceous understory, management to restore appropriate sagebrush covers may require reducing sagebrush cover to less than 15% in the short term.

Current policy is for full wildfire suppression throughout the Surprise and Winnemucca Field Offices, including all sage grouse breeding habitat. However, prescribed fire and other vegetation treatments continue to be considered for use in areas that meet the needs for sage grouse breeding habitat, if treatment is needed to maintain or improve ecological site conditions. Where vegetation treatment is proposed in areas used by sage grouse, the timing, size, and pattern of treatment are adjusted to minimize impacts on seasonal sage grouse habitat.

The guideline to maintain 18 cm of herbaceous cover around sagebrush for nest screening can be met, without changing current utilization guidelines of moderate use (see Cowhead/Massacre general decision #3, most AMP's, Leadville Allotment FMUD 1994, Buffalo Hills FMUD 1993, Soldier Meadows Allotment eFMUD 1994, Coyote Allotment AMP 1973, and Sonoma/Gerlach MFP III 1982), where: 1) ecological sites are meeting the mid/late/PNC seral stage objectives, and 2) where blue bunch wheatgrass is the dominant or a co-dominant species. Blue bunch wheatgrass is generally a significant portion of the community on loamy soils at higher elevations (>6000 feet), and on deep loamy soils and/or north facing slopes at lower elevations. The guideline would not be fully met where blue bunch wheatgrass is not a dominant/co-dominant species (either because the site does not have the potential to support blue bunch wheatgrass, or because the site is in an early seral stage), or where the community has moved beyond PNC and brush species are reducing the vigor/density of blue bunch wheatgrass. On sites dominated by other species of native, perennial grasses (such as Idaho fescue and Thurber's needle grass), the 18 cm herbaceous cover guideline is being met on very productive sites, and on areas which are less accessible to livestock and wild horses (especially on steeper slopes and areas that are more than ½ mile from water).

6. [" For non-migratory grouse occupying habitats that are uniformly distributed (i.e., habitats have the characteristics described in guideline 5 and are generally distributed around the leks), protect (i.e., do not manipulate) sagebrush and herbaceous understory within 3.2 km of all occupied leks. For non-migratory populations, consider leks the center of year-round activity and use them as focal points for management efforts (Braun et al. 1977)"(Connelly et al. 2000).]

7. ["For non-migratory populations where sagebrush is not uniformly distributed (i.e., habitats have the characteristics described in guideline 5 but irregularly distributed with respect to leks), protect suitable habitats for <5km from all occupied leks. Use radio-telemetry, repeated surveys for grouse use, or habitat mapping to identify nesting and early brood rearing habitats "(Connelly et al. 2000).]

8. ["For migratory populations, identify and protect breeding habitats <18 km of leks in a manner similar to that described for non-migratory sage grouse. For migratory sage grouse, leks generally are associated with nesting habitats but migratory birds may move >18 km from leks to nest sites. Thus, protection of habitat within 3.2 km of leks may not protect most of the important nesting areas (Wakkinen et al. 1992)"(Connelly et al. 2000).]

Surprise Field Office policy/decision: Response for 6, 7, and 8. Studies have not been conducted to determine if the leks in the Surprise Field Office managed portion of the Massacre PMU are migratory or non-migratory. Habitat is fairly uniformly distributed around most leks. The distribution of leks in the resource area is such that there are no areas within the Massacre PMU, which are more than 18 km from a lek.

Winnemucca Field Office policy/decision: Response for 6, 7, and 8. Studies have not been conducted to determine if the leks in the Winnemucca Field Office managed portion of the Massacre PMU are migratory or non-migratory. Habitat is fairly uniformly distributed around most leks. The distribution of leks in the resource area is such that there are no areas within the Massacre PMU, which are more than 18 km from a lek.

Current Field Office policy is to consider leks the center of year-round activity and to, "Prohibit all vegetation manipulation within two miles (3.2 km) of sage grouse strutting areas" (Tuledad/Home Camp LUP, Wildlife Decision #9, Leadville Allotment FMUD 1994, Buffalo Hills FMUD 1993, Soldier Meadows Allotment eFMUD 1994, Coyote Allotment AMP 1973, and Sonoma/Gerlach MFP III 1982).
In addition; it is Field Office policy to consider wildlife habitat needs prior to implementation of any land treatment projects. The timing, size, and pattern of treatment are adjusted to minimize short-term impacts on sage grouse habitat, and other wildlife habitat. Treatment projects tend to be relatively small in size, and all consider site-specific impacts on sage grouse seasonal habitat needs.

9. ["In areas of large-scale habitat loss (>40% of original breeding habitat), protect all remaining habitats from additional loss or degradation. If remaining habitats are degraded, follow guidelines for habitat restoration listed below" (Connelly et al. 2000).]

Surprise Field Office policy/decision: There are few, if any, areas within the Surprise Field Office portion of the Massacre PMU that can be characterized as having lost more than 40% of the original sage grouse breeding habitat. The policy of full wildfire suppression reduces the risk of losing large portions of sage grouse breeding habitat. Vegetation treatment is conducted on a site-specific basis, and the needs for sage grouse nesting habitat are considered whenever projects are proposed. Therefore, should large blocks of sage grouse breeding habitat be lost to wildfire, additional vegetation treatment in the area would not be proposed.

Winnemucca Field Office policy/decision: There are few, if any, areas within the Winnemucca Field Office portion of the Massacre PMU that can be characterized as having lost more than 40% of the original sage grouse breeding habitat. The policy of full wildfire suppression reduces the risk of losing large portions of sage grouse breeding habitat. Vegetation treatment is conducted on a site-specific basis, and the needs for sage grouse nesting habitat are considered whenever projects are proposed. Therefore, should large blocks of sage grouse breeding habitat be lost to wildfire, additional vegetation treatment in the area would not be proposed.

11.["Suppress wildfires in all breeding habitats. In the event of multiple fires, land management agencies should have all breeding habitats identified and prioritized for suppression, giving the highest priority to breeding habitats that have become fragmented or reduced by >40% in the last 30 years "(Connelly et al. 2000).]

Surprise Field Office policy/decision: There are few, if any, areas within the Surprise Field Office portion of the Massacre PMU that can be characterized as

having lost more than 40% of the original sage grouse breeding habitat. It is current Surprise Field Office policy to suppress all wildfires, regardless of where they occur. To date, current staffing levels have been sufficient to respond to all fires as they occur. Therefore, fire suppression has not needed to be prioritized. Should prioritization for wildfire suppression become necessary in the future, urban interface areas would probably receive the highest priority, followed by low elevation sites prone to cheatgrass invasion, then by high elevation areas (including most sage grouse breeding habitats).

Winnemucca Field Office policy/decision: There are few, if any, areas within the Winnemucca Field Office portion of the Massacre PMU that can be characterized as having lost more than 40% of the original sage grouse breeding habitat. It is current Winnemucca Field Office policy to suppress all wildfires, regardless of where they occur. To date, current staffing levels have been sufficient to respond to all fires as they occur. Therefore, fire suppression has not needed to be prioritized. Should prioritization for wildfire suppression become necessary in the future, urban interface areas would probably receive the highest priority, followed by low elevation sites prone to cheatgrass invasion, then by high elevation areas (including most sage grouse breeding habitats).

13.["Before initiating vegetation treatments, quantitatively evaluate the area proposed for treatment to ensure that it does not have sagebrush and herbaceous cover suitable for breeding habitat (Table 3) (Appendix I). Treatments should not be undertaken within sage grouse habitats until the limiting vegetation factor(s) has been identified, the proposed treatment is known to provide the desired vegetation response, and land use activities can be managed after treatment to ensure that vegetation objectives are met "(Connelly et al. 2000).]

Surprise Field Office policy/decision: With the exception of non-native species seedings and fuel reduction projects, land treatments in the Surprise Field Office managed portion of the Massacre PMU are conducted with the objective of maintaining or restoring ecological site conditions. Ecological sites in mid to late seral stage generally provide the most ideal sage grouse breeding habitat possible for the site. Few land treatments are currently conducted in the resource area. All are relatively small in size, and all consider site-specific impacts on sage grouse seasonal habitat needs. The timing, size, and pattern of treatment are adjusted to minimize short-term impacts on sage grouse, and other wildlife habitat. At the current scale of implementation, land treatments in the Surprise Resource Area are providing a net benefit to sage grouse habitat.

Winnemucca Field Office policy/decision: With the exception of non-native species seedings and fuel reduction projects, land treatments in the Winnemucca Field Office managed portion of the Massacre PMU are conducted with the objective of maintaining or restoring ecological site conditions. Ecological sites in mid to late seral stage generally provide the most ideal sage grouse breeding habitat possible for the site. Few land treatments are currently conducted in the resource area. All

are relatively small in size, and all consider site-specific impacts on sage grouse seasonal habitat needs. The timing, size, and pattern of treatment are adjusted to minimize short-term impacts on sage grouse, and other wildlife habitat. At the current scale of implementation, land treatments in the Winnemucca Field Office are providing a net benefit to sage grouse habitat.

14.["Restore degraded rangelands to a condition that again provides suitable breeding habitat for sage grouse by including sagebrush, native forbs (especially legumes), and native grasses in reseeding efforts (Apa 1998). If native forbs and grasses are unavailable, use species that are functional equivalents and provide habitat characteristics similar to those of native species "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Rehabilitation seed mixtures always include native species of grasses, shrubs (including big sagebrush), and forbs. Non-native species, such as crested wheatgrass and forage kochia are only used in areas where native species have little or no chance of successfully reseeding. Current BLM policy is to support native species habitat and communities whenever possible.

Winnemucca Field Office policy/decision: Rehabilitation seed mixtures always include native species of grasses, shrubs (including big sagebrush), and forbs. Non-native species, such as crested wheatgrass and forage kochia are only used in areas where native species have little or no chance of successfully reseeding. Current BLM policy is to support native species habitat and communities whenever possible.

18. ["When restoring habitats dominated by mountain big sagebrush, regardless of the techniques used (e.g., fire, herbicides), treat <20% of the breeding habitat (including areas burned by wildfire) within a 20-year period (Bunting et al. 1987). The 20-year period represents the approximate recovery time for a stand of mountain big sagebrush. Additional treatments should be deferred until the previously treated area again provides suitable breeding habitat (Table 3). In some cases, this may take <20 years and in other cases >20 years. If 2,4-D or similar herbicides are used, they should be applied in strips in a manner that minimizes their effect on forbs "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Wall Canyon East AMP, Objective #4 - Allows for treating up to 15% of Mountain big sagebrush sites every 5 years (up to 60% every 20 years). Cowhead/Massacre LUP, Decision #16 C, 3(a) and 4(a) – Allow for treating up to 90% of any particular treatment area.

Current Field Office policy is to consider wildlife habitat needs prior to implementation of any land treatment projects. The timing, size, and pattern of treatment are adjusted to minimize short-term impacts on sage grouse habitat, and other wildlife habitat. Treatment projects tend to be relatively small in size, and all consider site-specific impacts on sage grouse seasonal habitat needs. At the

current scale of implementation, land treatments in the Surprise and Winnemucca Resource Areas are providing a net benefit to sage grouse habitat.

Current funding levels allow for little land treatment annually. As a result, there is little risk that large portions of sage grouse breeding habitat would be treated, other than through prescribed fire on the higher elevation mountain big sagebrush sites.

Winnemucca Field Office policy/decision: Specific policies or decisions are not in place that address restoration of habitats dominated by mountain big sagebrush.

19.["All wildfires and prescribed burns should be evaluated as soon as possible to determine if reseeding is necessary to achieve habitat management objectives. If needed, reseed with sagebrush, native bunchgrasses, and forbs whenever possible" (Connelly et al. 2000).]

Surprise Field Office policy/decision: All burns of a significant size (over about 100 acres), or which occur in areas susceptible to noxious weed or cheatgrass invasion, are immediately evaluated to determine if reseeding is necessary. Where it is determined that reseeding is needed, a seed mixture that is appropriate for the site is determined, and reseeding is completed as soon as possible (generally before the next growing season). It is current BLM policy to support native species habitat and communities whenever possible. Therefore, rehabilitation seed mixtures are always composed of native species of grasses, shrubs (including big sagebrush), and forbs. Non-native species, such as crested wheatgrass and forage kochia are only used in areas where native species have little or no chance of successfully reseeding.

Winnemucca Field Office policy/decision: All burns of a significant size (over about 100 acres), or which occur in areas susceptible to noxious weed or cheatgrass invasion, are immediately evaluated to determine if reseeding is necessary. Where it is determined that reseeding is needed, a seed mixture that is appropriate for the site is determined, and reseeding is completed as soon as possible (generally before the next growing season). It is current BLM policy to support native species habitat and communities whenever possible. Therefore, rehabilitation seed mixtures are always composed of native species of grasses, shrubs (including big sagebrush), and forbs. Non-native species, such as crested wheatgrass and forage kochia are only used in areas where native species have little or no chance of successfully reseeding.

20.["Until research unequivocally demonstrates that use of tebuthiuron and similar acting herbicides to control sagebrush has no long-lasting negative impacts on sage grouse habitat, use these herbicides only on an experimental basis and over a sufficiently small area that any long-term negative impacts are negligible. Because these herbicides have the potential of reducing but not eliminating sagebrush cover within grouse breeding habitats, thus stimulating herbaceous development, their use as

sage grouse habitat management tools should be closely examined ”(Connelly et al. 2000).]

Surprise Field Office policy/decision: Due to political pressure surrounding the safety of agricultural chemical use on public lands (primarily concerns about wildlife habitat, water quality, and recreational human exposure), herbicides have not been used in the Surprise Resource Area for many years. Experiments, using herbicide spraying on sites with severely degraded understories, are currently planned on the Home Camp Allotment to determine if such treatment can recover native herbaceous understories. However, research cannot be said to have unequivocally demonstrated that herbicides have no long-lasting negative impacts on sage grouse habitat, or any other resource value on public lands. Until it does, political pressure to not use chemicals on public lands will continue. Therefore, it is not anticipated that herbicide use will become a standard, widespread practice for restoring sites with degraded understories in the near future.

Winnemucca Field Office policy/decision: Due to political pressure surrounding the safety of agricultural chemical use on public lands (primarily concerns about wildlife habitat, water quality, and recreational human exposure), herbicides have not been used in the Winnemucca Field Office for many years. However, research cannot be said to have unequivocally demonstrated that herbicides have no long-lasting negative impacts on sage grouse habitat or any other resource value on public lands. Until it does, political pressure to not use chemicals on public lands will continue. Therefore, it is not anticipated that herbicide use will become a standard, widespread practice for restoring sites with degraded understories in the near future.

29. [“Maintain sagebrush communities on a landscape scale, allowing sage grouse access to sagebrush stands with canopy cover of 10-30% and heights of at least 25-35 cm regardless of snow cover. These areas should be high priority for wildfire suppression and sagebrush control should be avoided.

Surprise and Winnemucca Field Office policy/decisions: There is virtually no risk that sagebrush will not be maintained on a landscape scale in the Surprise and Winnemucca Field Offices. Sage grouse have, and will continue to have, access to a wide variety of sagebrush communities with appropriate canopy covers and heights suitable for winter habitat needs throughout the Surprise and Winnemucca Resource Area portions of the Massacre PMU.

It is current Surprise and Winnemucca Field Office policy to suppress all wildfires, regardless of where they occur. To date, current staffing levels have been sufficient to respond to all fires as they occur. Therefore, fire suppression has not needed to be prioritized. Should prioritization for wildfire suppression become necessary in the future, urban interface areas would probably receive the highest priority, followed by low elevation sites prone to cheatgrass invasion (including large portions of sage grouse winter habitat), then by high elevation areas.

Few land treatments are currently conducted in the resource area. All are relatively small in size, and all consider site-specific impacts on sage grouse seasonal habitat needs, including winter habitat. The timing, size, and pattern of treatment are adjusted to minimize short-term impacts on sage grouse, and other wildlife habitat. At the current scale of implementation, land treatments in the Surprise and Winnemucca Resource Areas are providing a net benefit to sage grouse habitat.

30. Protect patches of sagebrush within burned areas from disturbance and manipulation. These areas may provide the only winter habitat for sage grouse and their loss could result in the extirpation of the grouse population. They are also important seed sources for sagebrush re-establishment in the burned areas. During fire suppression activities do not remove or burn any remaining patches of sagebrush within the fire perimeter.

Surprise Field Office policy/decision: There is no active fire plan to specify areas that should be left with islands of unburned fuel. As a result, general firefighting techniques are standard practice, including back burning and burning out islands of unburned fuel during wildfire suppression. At the current scale of wildfire, prescribed fire, and vegetation treatment, there is virtually no risk of losing all, or even a significant portion, of the sage grouse winter habitat in the Surprise Resource Area. However, the practice of removing unburned islands of fuel does slow re-establishment of sagebrush within burned areas.

Winnemucca Field Office policy/decision: There is no active fire plan to specify areas that should be left with islands of unburned fuel. However the Winnemucca Field Office discourages burning out islands in Sage-grouse habitats. At the current scale of wildfire, prescribed fire, and vegetation treatment, there is virtually no risk of losing all, or even a significant portion, of the sage grouse winter habitat in the Winnemucca Field Office portion of the Massacre PMU.

31. In areas of large-scale habitat loss (>40% of original winter habitat), protect all remaining habitats.

Surprise Field Office policy/decision: There are few, if any, areas within the Surprise Field Office portion of the Massacre PMU that can be characterized as having lost more than 40% of the original sage grouse winter habitat. See WAFWA Guideline #9 for further discussion.

Winnemucca Field Office policy/decision: There are few, if any, areas within the Winnemucca Field Office portion of the Massacre PMU that can be characterized as having lost more than 40% of the original sage grouse winter habitat. See WAFWA Guideline #9 for further discussion.

32. Reseed former winter range with the appropriate subspecies of sagebrush and herbaceous species unless the species are re-colonizing the area in a density that would allow recovery (Table 3) within 15 years.

Surprise Field Office policy/decision: All burns of a significant size (over about 100 acres), or which occur in areas susceptible to noxious weed or cheatgrass invasion, are immediately evaluated to determine if reseeding is necessary. Where it is determined that reseeding is needed, a seed mixture that is appropriate for the site is determined, and reseeding is completed as soon as possible (generally before the next growing season). Rehabilitation seed mixtures always include native species of grasses, shrubs (including big sagebrush), and forbs.

Winnemucca Field Office policy/decision: All burns of a significant size (over about 100 acres), or which occur in areas susceptible to noxious weed or cheatgrass invasion, are immediately evaluated to determine if reseeding is necessary. Where it is determined that reseeding is needed, a seed mixture that is appropriate for the site is determined, and reseeding is completed as soon as possible (generally before the next growing season). Rehabilitation seed mixtures always include native species of grasses, shrubs (including big sagebrush), and forbs.

Most high elevation areas that burn recover adequate sagebrush cover within 15 years, regardless of the extent of the burn. Most low elevation areas that burn require reseeding to prevent cheatgrass encroachment; they frequently do not recover sagebrush and good sage grouse habitat regardless of how they are seeded. Most mid elevation areas do not burn large or blocky areas; they tend to burn in small mosaics, up drainages, and on deeper, more productive soils. Sagebrush seed sources are present adjacent to the burned areas, and these sites rarely require seeding to re-establish good sage grouse habitat.

33. Discourage prescribed burns >50 ha and do not burn >20% of an area used by sage grouse during winter within any 20–30 year interval (depending on estimated recovery time for the sagebrush habitat) ”(Connelly et al. 2000).]

Surprise Field Office policy/decision: Due to cost constraints, most prescribed burns in the Surprise Resource Area cover more than 50 ha (20 acres). However, few prescribed burns are conducted in sage grouse winter habitat. Current funding levels allow for little land treatment annually. As a result, priority is given to areas that will respond reliably well, and which will benefit the largest number of resources. In general, these are higher elevation sites, which provide sage grouse breeding and brood rearing habitat, rather than winter habitat. Few treatments are proposed in sage grouse winter habitat because rehabilitation at these elevations is very slow and expensive. Fire in particular is rarely prescribed on low elevation Wyoming big sagebrush sites because of their susceptibility to cheatgrass encroachment.

Winnemucca Field Office policy/decision: Due to cost constraints, most prescribed burns in the Winnemucca Resource Area cover more than 50 ha (20

acres). However, few prescribed burns are conducted in sage grouse winter habitat. Current funding levels allow for little land treatment annually. As a result, priority is given to areas that will respond reliably well, and which will benefit the largest number of resources. In general, these are higher elevation sites, which provide sage grouse breeding and brood rearing habitat, rather than winter habitat. Few treatments are proposed in sage grouse winter habitat because rehabilitation at these elevations is very slow and expensive. Fire in particular is rarely prescribed on low elevation Wyoming big sagebrush sites because of their susceptibility to cheatgrass encroachment.

Risk #2: Long-term or permanent conversion of sagebrush communities to perennial herbaceous communities

Season/Habitat affected: All

There are eight crested wheatgrass seedings, covering approximately 25,800 acres in the Massacre PMU. This represents approximately 3% of the acres that occur in the Surprise Field Office managed portion of the PMU. The majority of the acres treated in response to the Cowhead/Massacre Land Use Plan had specified leave areas, and they were completed to "adhere to Nevada Department of Wildlife, "Guidelines for Vegetal Control Programs in Sage Grouse Habitats in Nevada (1969, revised 1972)." Six of the seedings, including 20,200 acres support dense stands of primarily crested wheatgrass. These areas are used to defer livestock grazing of native rangelands. At this time the BLM has no plans to re-introduce sagebrush to these areas or manage for an increase in native species. Two of the seedings, including about 5,600 acres no longer support significant amounts of crested wheatgrass, and they have been re-colonized by sagebrush. The BLM plans to reduce sagebrush in portions of these seedings and re-seed with primarily native herbaceous vegetation (see Appendix #2, Home Camp Allotment Management Plan). The objectives for these seedings would be to continue to support early season livestock use, to defer use by livestock on native rangelands, and to improve the condition of the seedings for sage grouse nesting and brood rearing habitat.

Contributing Management Action: Non-native species seedings
Risk Rating: Low

The risk of permanently converting additional acres of sagebrush communities to perennial herbaceous communities as a result of non-native species seedings is low. The majority of the acres identified for vegetation treatment (spraying or seeding) in the Cowhead/Massacre Land Use Plan have been completed (see Appendix #2, Subunit #2, decision #14 and Subunit #3, decision #8). Within the Tuledad/Home Camp LUP area, most of the sites, which have been identified as having the potential for successful treatment, have been developed. Most existing seedings would be maintained as herbaceous communities. However, at this time there are no plans to develop

additional crested wheatgrass seedings. In addition, it is current BLM policy to support native species habitat and communities whenever possible. In the future, where seedings need maintenance, sage-grouse and other wildlife species habitat needs will be considered in terms of the percentage of the area which is treated annually and over time, the pattern of treatment (mosaic vs block), the type of treatment (mechanical, chemical, fire), and the species used to reseed the area following treatment.

Conservation Measure(s): *Where possible, use native seed mixtures appropriate to the soil, climate and landform. Use management to increase sagebrush in existing seedings.*
Responsible Parties: BLM and Permittees
Monitoring: *Vegetation monitoring should include, 1) annual site inspections/photo points to confirm that native, perennial vegetation has stabilized soils and that cheatgrass and noxious weeds are not encroaching, and 2) line transects every 3-5 years to track recovery of sagebrush and herbaceous vegetation canopy cover.*

Contributing Management Action: Fire on low elevation areas with strong understories
Risk Rating: Low

The risk of permanently converting additional acres of sagebrush communities to perennial herbaceous communities as a result of fire on low elevation areas with strong understories is also low. Fire is rarely prescribed on low elevation areas, regardless of the condition of the understory, because of the susceptibility of these areas for cheatgrass encroachment and because these sites seldom become significantly more valuable for either wildlife habitat or livestock forage following fire. When fire is prescribed on low elevation areas, the prescription is cool, tightly controlled, and covers small acreages. Wildfire starts on low elevation big sagebrush communities with strong native perennial understories are rare in the Surprise and Winnemucca Field Office managed portions of the Massacre PMU. The native bunchgrass and sagebrush communities on these sites do not normally provide adequate continuous fuels to carry wildfire under anything other than unusually hot, windy, and dry weather conditions. The natural fire regime on these sites is much longer than on higher elevation sites.

Conservation Measure(s): *Continue to emphasize wildfire suppression on lower elevations. Only use prescribed fire on low elevations when there are no other reasonable options for maintaining resource objectives.*
Responsible Parties: BLM
Monitoring: *Frequently check burned areas for livestock during the first two growing seasons following fire to ensure compliance with rest. Periodically check burned areas to ensure compliance with further grazing management prescriptions. Monitor burned area vegetation to ensure overstory and understory objectives are being met.*

WAFWA Guidelines: (See Appendix #1). 5, 6, 7, 8, 9, 11, 13, 19, 29, 31, and 32 See discussion under Risk #1; 17.

17. ["When restoring habitats dominated by Wyoming big sagebrush, regardless of the techniques used (e.g., prescribed fire, herbicides), do not treat >20% of the breeding habitat (including areas burned by wildfire) within a 30-year period (Bunting et al. 1987). The 30-year period represents the approximate recovery time for a stand of Wyoming big sagebrush. Additional treatments should be deferred until the previously treated area again provides suitable breeding habitat (Table 3). In some cases, this may take <30 years and in other cases >30 years. If 2,4-D or similar herbicides are used, they should be applied in strips in a manner that minimizes their effect on forbs. Because fire generally burns the best remaining sage grouse habitats (i.e., those with the best understory) and leaves areas with sparse understory, use fire for habitat restoration only when it can be convincingly demonstrated to be in the best interest of sage grouse "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Wall Canyon East AMP, Objective #5 - Allows for treating up to 10% of Wyoming big sagebrush sites every 10 years (up to 30% every 30 years). Cowhead/Massacre LUP, Decision #16 C, 3(a) and 4(a) – Allow for treating up to 90% of any particular treatment area.

Winnemucca Field Office policy/decision: Specific policies or decisions are not in place that address restoration of habitats dominated by Wyoming big sagebrush.

Current funding levels allow for little land treatment annually. As a result, priority is given to areas that will respond reliably well, and which will benefit the largest number of resources. In general, these are higher elevation sites, which provide scarce summer habitat for wildlife, as well as mid/late season forage for livestock and wild horses, and recreational opportunities. These higher elevations are capable of supporting taller grass species and denser herbaceous understories, which produce better sage grouse nesting habitat. Few treatments are proposed in Wyoming big sagebrush sites because rehabilitation at these elevations is very slow and expensive, and these sites generally do not have the potential to produce ideal sage grouse nesting habitat. Fire in particular is rarely prescribed on Wyoming big sagebrush sites because of their susceptibility to cheatgrass encroachment.

There is little risk of deliberately treating too many acres of Wyoming big sagebrush sites per year. The larger risk in Wyoming big sagebrush sites is not treating them. This allows them to continue producing less herbaceous vegetation than is ideal for successful sage grouse nesting. Ultimately, if the sagebrush overstory becomes too dense, the understory is weakened and the sites become even more susceptible to cheatgrass invasion.

Risk #3: Conversion of sagebrush communities to annual herbaceous communities or noxious weeds

Season/Habitat affected: All

Contributing Management Action: Fire on areas with weak understories, usually low elevations.
Risk Rating: High

The risk of conversion of sagebrush communities with weak understories to annual herbaceous communities as a result of fire is high. Approximately 10% (65,872 acres) of the Surprise Field Office managed portion of the Massacre PMU and 10% of the Winnemucca Field Office portion (46,671 acres) of the Massacre PMU has the potential to be dominated by cheatgrass. Cheatgrass is a strong component of the understory on many of the lowest elevations, and it is very competitive with native herbaceous vegetation, especially when these areas burn. Historic livestock grazing practices that removed the understory vegetation contributed to the establishment of cheatgrass; rehabilitating these communities requires brush disturbance, seeding, and careful livestock management. Rehabilitation in these communities is very slow, risky, and extremely expensive. As a result, little rehabilitation has been attempted in areas with strong cheatgrass components until after a wildfire has burned through the community and cheatgrass has become the dominant (or sole) species on the site. Aggressive fire suppression is emphasized on sites with strong cheatgrass components, in an attempt to prevent them from becoming solid stands of cheatgrass; however, fires which start in these communities are frequently wind driven, fast moving, and difficult to control.

Conservation Measure(s): *Initiate emergency rehabilitation measures using site specific seeding or other appropriate treatments with emphasis on low elevation and/or south facing slopes. Increase priority for fire suppression and Emergency Site Rehabilitation (ESR) on R-2 sites to prevent shift to an R-4. Limit back burning and burning out islands of unburned fuel.*
Responsible Parties: BLM
Monitoring: *Vegetation monitoring should include, 1) annual site inspections/photo points to confirm that native, perennial vegetation has stabilized soils and that cheatgrass and noxious weeds are not encroaching, and 2) line transects every 3-5 years to track recovery of sagebrush and herbaceous vegetation canopy cover.*

Contributing Management Action: Noxious weed invasion
Risk Rating: Low

The risk of conversion of sagebrush communities to noxious weeds is moderate. The seed source and vectors to transport seed (roads, vehicles, livestock, wind, and water) are here. However, the type of noxious weeds which tend to occupy sagebrush habitat generally require significant soil disturbance, such as that found along roads and heavily used livestock/wild horse trails, around livestock/wild horse watering sites, and around mines, excavations, agricultural sites, and project developments. Known populations include Russian knapweed, perennial pepper weed, Scotch thistle, bull thistle, Canada thistle, musk thistle, Mediterranean sage, dyers woad, and hoary cress. Perennial pepper weed represents the largest risk to sage grouse habitat in the Surprise and Winnemucca Field Office portions of the Massacre PMU. However, the risk is primarily

due to conversion of meadow communities along riparian corridors, rather than conversion of sagebrush communities. Russian knapweed and hoary cress are the next most important threat to sage grouse habitat, due to the widespread distribution of the two species in disturbed big sagebrush communities.

Table #1: Noxious Weeds

Species	Known Extent in Massacre PMU	Susceptible Sites
Perennial Pepper weed	**Numerous populations** 9 miles of Wall Canyon Creek (ranch to upper reservoir) 30 miles of NV Hwy 447 (south Duck Flat to Gerlach, Winnemucca FO) 23 miles of NV Hwy 34 (Black Rock Desert to Leadville Cyn, Winn. FO) Private lands in Long Valley and south Surprise Valley.	Strongly associated with water in perennial and ephemeral drainages and wetlands. Also associated with roads and disturbed areas. Aggressive suppression efforts.
Russian Knapweed	**Numerous populations** 30 miles of NV Hwy 447 (south Duck Flat to Gerlach, Winnemucca FO) 43 miles of NV Hwy 34 (Gerlach to Red Ball Junction, including a 130 acre block at the Swingle Ranch, primarily Winnemucca FO) Private lands in south Surprise Valley.	Strongly associated with roads, abandoned agricultural areas, and other disturbed areas. Aggressive suppression efforts
Scotch Thistle	**17 populations** Grassy Canyon and Long Valley	Usually associated with disturbed areas. Aggressive suppression efforts.
Bull Thistle	**11 populations** Widely scattered	Closely associated with springs and wet areas. Non-aggressive suppression
Canada Thistle	**3 populations** Little High Rock Lake, upper Kissler Spring, and Wall Canyon Creek	Disturbed areas in/near water (dams, roads, reservoirs) Moderate suppression efforts.
Musk Thistle	**1 population** Private land near NV Hwy 447 (Winnemucca FO)	Usually associated with disturbed areas. Aggressive suppression efforts
Dyers Woad	**1 population** Red Ball Junction on highway 34	Roads and disturbed areas Aggressive suppression efforts
Mediterranean Sage	**1 population** Hays Canyon Road	Roads and disturbed areas Aggressive suppression efforts
Hoary Cress	**Widespread**	Roads and disturbed areas Non-aggressive suppression
Medusa head	**Widespread**	Roads and disturbed areas Aggressive suppression efforts
White top	**11 known populations**	Roads and disturbed areas Aggressive suppression efforts

***Conservation Measure(s)**: Aggressively treat noxious weed and other invasive plants where they threaten sage-grouse habitat.*
Responsible Parties: BLM, local counties
***Monitoring:** Monitor treatments annually until controlled/eliminated.*

WAFWA Guidelines: (See Appendix #1). 5, 6, 7, 8, 9, 11, 14, 19, 29, 30, 31, 32, and 33 See discussions under Risk #1; 16 and 21

16. ["Do not use fire in sage grouse habitats prone to invasion by cheatgrass and other invasive weed species unless adequate measures are included in restoration plans to replace the cheatgrass understory with perennial species using approved reseeding strategies. These strategies could include, but are not limited to use of pre-emergent herbicides (e.g., Oust®, Plateau®) to retard cheatgrass germination until perennial herbaceous species become established "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Rehabilitation in communities with a strong cheatgrass component is very slow, risky, and extremely expensive. As a result, little rehabilitation has been attempted in these areas until after a wildfire has burned through the community and cheatgrass has become the dominant (or sole) species on the site. Fire is rarely prescribed on low elevation areas because of their susceptibility to cheatgrass encroachment, and because these sites seldom become more valuable for either wildlife habitat or livestock forage following fire. Where rehabilitative fire is prescribed on low elevation areas, the prescription is cool, tightly controlled, and covers small acreages.

Winnemucca Field Office policy/decision: Rehabilitation in communities with a strong cheatgrass component is very slow, risky, and extremely expensive. As a result, little rehabilitation has been attempted in these areas until after a wildfire has burned through the community and cheatgrass has become the dominant (or sole) species on the site. Fire is rarely prescribed on low elevation areas because of their susceptibility to cheatgrass encroachment, and because these sites seldom become more valuable for either wildlife habitat or livestock forage following fire. Where rehabilitative fire is prescribed on low elevation areas, the prescription is cool, tightly controlled, and covers small acreages.

Due to political pressure surrounding the safety of agricultural chemical use on public lands (primarily concerns about wildlife habitat, water quality, and recreational human exposure), pre-emergent herbicides have not been used in the Surprise and Winnemucca Field Offices for many years, and it is not anticipated that herbicide use will become a standard, widespread practice for restoring sites with cheatgrass encroachment in the near future.

21. ["Avoid land use practices that reduce soil moisture effectiveness, increase erosion, cause invasion of exotic plants, and reduce abundance and diversity of forbs "(Connelly et al. 2000).]

Surprise Field Office policy/decision: With the exception of non-native species seedings, all of the lands in the Surprise Field Office managed portion of the Massacre PMU are being managed for mid-, late-, or potential natural communities, as defined by the NRCS ecological site potentials (see Cowhead/Massacre LUP;

Subunit #1, decision #6; Subunit #2, decision #5; Subunit 3, decision #4; and the Tuledad/Home Camp LUP Range Management decision #1). By definition, management for mid-seral or later ecological condition should maintain soil moisture retention, reduce erosion, reduce the likelihood of exotic plant invasion, and maintain the appropriate abundance and diversity of native forbs.

Winnemucca Field Office policy/decision: With the exception of non-native species seedings, all of the lands in the Winnemucca Field Office managed portion of the Massacre PMU are being managed for mid-, late-, or potential natural communities, as defined by the NRCS ecological site potentials (Sonoma/Gerlach MFP III 1982) By definition, management for mid-seral or later ecological condition should maintain soil moisture retention, reduce erosion, reduce the likelihood of exotic plant invasion, and maintain the appropriate abundance and diversity of native forbs.

Many of the land uses that are allowed on BLM managed lands in the Surprise and Winnemucca Field Office portions of the Massacre PMU, including livestock and wild horse grazing, off highway vehicles, dispersed and concentrated recreation, and mining and energy development result in localized impacts that reduce soil moisture retention, increase erosion, increase invasion by exotic plant species, and reduce the abundance and diversity of forbs. These impacts are frequently higher in sage grouse summer habitat because livestock, wild horses, and recreational users concentrate their activities around water. These activities, and the resulting impacts, cannot be completely avoided. However, the impacts are mitigated, where possible, through livestock management systems, livestock and wild horse stocking levels, seasonal and permanent road closures, controls on dispersed camping areas, and mine site and reclamation plans. The vast majority of the planning decisions and land management policies in the Surprise Resource Area are designed to minimize these types of impacts.

See Cowhead/Massacre LUP - General Decisions #3, 4, 5, 15, and 16; Subunit #1, Decisions #6, 7, 9, and 10; Subunit #2, Decisions #1, 5, 6, and 15; Subunit #3, Decisions #1 and 4;
See Tuledad/Home Camp LUP - Range Management Objective #1, 4, 5, and 6; Range Management Decision #1; Wildlife Decision #7; Wild Horse Objective and Decision #1; Recreation Decision #1; Lands Decision #1 and 3.

See Leadville Allotment FMUD 1994, Buffalo Hills FMUD 1993, Soldier Meadows Allotment eFMUD 1994, Coyote Allotment AMP 1973, and Sonoma/Gerlach MFP III 1982.

See Allotment Management Plans, Annual Operating Plans, Multiple Use Decisions, Wildfire Rehabilitation Plans, Rangeland Health Standards and Guidelines…

Risk #4: Conversion of sagebrush to juniper

Season/Habitat affected: All

Contributing Management Action: Lack of fire/disturbance in areas susceptible to juniper encroachment
Risk Rating: High

As a result of long-term fire suppression, western juniper, which naturally occurs on fire-safe sites along ridges, is encroaching down slopes into sagebrush communities. The encroachment is quickest on mountain big sagebrush sites, especially in deeper soils, on north-facing slopes, and along ephemeral drainages. Encroachment is also occurring more slowly in some low sagebrush, and Wyoming big sagebrush sites. As the density of juniper increases, the health of the understory communities decline. The vigor and density of brush species is reduced first and the herbaceous community is affected later. Eventually, little or no understory vegetation remains, and the site is converted to a monotypic juniper community. Once the shrub understory collapses, effective control of juniper encroachment becomes much more difficult, expensive, and dangerous for fire crews. Because there are no shrubs to provide ladder fuels, prescriptions for fire become hotter and riskier, and can cause extreme fire behavior. Recovering the understory after such hot fires is also more difficult, as the heat of the fire destroys much of the seed bank. The only alternative to prescribed fire in recovering these sites is hand-cutting juniper trees, a very expensive and time-consuming activity.

Sage grouse will use areas with some juniper during late brood rearing and wintering, so long as a healthy sagebrush understory remains. However, juniper trees are used by raptors for perch sites while they are hunting. As a result, sage grouse frequently abandon lek, nesting, and early brood rearing areas that are encroached upon by juniper long before the sagebrush understory is affected.

In the Surprise Resource Area portion of the Massacre PMU, 22,776 acres of sagebrush communities (approximately 3% of the PMU) have been encroached upon by juniper. So long as fire suppression remains high in mountain big sagebrush communities, the risk of converting additional acres of sage-grouse habitat to juniper sites will remain high. As time goes on, recovering these sites to sagebrush communities will become more and more difficult.

In the Winnemucca Field Office portion of the Massacre PMU, 5335 acres of sagebrush communities (approximately 1% of the PMU) have been encroached upon by juniper. So long as fire suppression remains high in mountain big sagebrush communities, the risk of converting additional acres of sage-grouse habitat to juniper sites will remain high. As time goes on, recovering these sites to sagebrush communities will become more and more difficult.

Conservation Measure(s): *Mechanical treatment or prescribed fire. Treat subject in revision of AMP's, new Resource Management Plans (RMP's), current and projected rangeland projects.*
Responsible Parties: BLM, private landowners
Monitoring: *Set up repeatable photo-points, take before and after photos of site. Revisit photo points every 5 years.*

WAFWA Guidelines: (See Appendix #1). 1, 5, 13, and 18 See discussion under Risk #1; 2.

2.["Use appropriate vegetation treatment techniques (e.g., mechanical methods, fire) to remove junipers and other conifers that have invaded sage grouse habitat (Commons et al. 1999). Whenever possible, employ vegetation control techniques that are least disruptive to the stand of sagebrush, if this stand meets the needs of sage grouse (Appendix I) "(Connelly et al. 2000).]

Surprise Field Office policy/decision: The Surprise Field Office is conducting numerous projects to reduce populations of mature juniper by hand cutting juniper in sagebrush and riparian communities. However, due to current funding levels, the number of acres being treated is insignificant when compared to the number of acres of sage grouse habitat which have been, or which will be, converted to mature juniper sites. Preventing large portions of sagebrush communities from becoming mature juniper sites will require either a much greater number of acres of mechanical land treatment, or more invasive techniques (fire) on sites that are currently producing good sage grouse habitat (mountain big sagebrush communities with numerous young juniper). In the short-term, these types of prescribed fires will have localized impacts on sage grouse habitat. However, in the long term, thousands of acres of sage grouse habitat will be retained.

Winnemucca Field Office policy/decision: The Winnemucca Field Office portion of the Massacre PMU does not contain large populations of mature juniper stands.

Risk #5: Loss of sagebrush habitat to mining and agricultural or urban expansion

Season/Habitat affected: All

Contributing Management Action: Mining
Risk Rating: Low

Mining companies have claimed a large portion of the Massacre PMU. However, only one mine area (covering less than 2000 acres) has proven to be worth developing into a mining operation (Hog Ranch Mine). Hog Ranch Mine is now closed and reclaimed to some native and some non-native vegetation. If gold prices go up, additional areas may be mined. However, the risk of new mining operations is low.

Within the Winnemucca Field Office portion of the Massacre PMU there are many claims by mining companies. One active gold mine is present within the PMU by Division Peak with ground disturbance of around 5 acres. There is one active exploration notice in Squaw Valley on the west side of the Granite Mountains with ground disturbance of around 5 acres. If gold prices go up, additional areas may be mined. However, the risk of new mining operations is low.

Conservation Measure(s): *Avoid surface occupancy within 2 miles of known/occupied sage-grouse use areas, consider off site mitigation. Reclaim mining areas after disturbance with native seeding.*
Responsible Parties: BLM
Monitoring: *Revisit adjacent leks annually to track any changes due to presence of mine. Establish photo-points and site inspect annually at first to establish that seed mix is appropriate for site, then revisit every 3-5 years.*

Contributing Management Action: Urban and agricultural expansion
Risk Rating: Low

Approximately 95,000 acres (8%) of the Massacre PMU are private. Private land is scattered throughout the PMU, mainly associated with water at springs and along drainages. Larger blocks of private lands are found on 49 Mountain, Boulder Mountain, around Home Camp Ranch, in the south Granite Mountains, and on Hualapai Flat. This land has some opportunity for development, primarily in the form of seasonal recreational cabins and expansion around existing agricultural development. However, water and seasonal accessibility limit the extent of private land development, and the risk to sage grouse from this development is low.

Conservation Measure(s): *Retain public lands that contain leks or other important habitat unless acquisition would result in obtaining equal or better habitat.*
Responsible Parties: *BLM, local and state governments.*
Monitoring: *None*

WAFWA Guidelines: (See Appendix #1). 6, 7, 8, and 9 See discussion under Risk #1.

Additional WAFWA Guidance:

***From breeding habitat introduction. ["Although mining and energy development are common activities throughout the range of sage grouse, quantitative data on the long-term effects of these activities on sage grouse are limited. However, some negative impacts have been documented (Braun 1998). Thus, these activities should be discouraged in breeding habitats, but when unavoidable, restoration efforts should follow procedures outlined in these guidelines "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Tuledad/Home Camp Minerals Decision #1. Little energy development has occurred in the Surprise Resource Area. Field Office policy is to consult with state wildlife agencies when developing site plans for

energy and mining activities. Bonds for restoration of sites and/or to mitigate site impacts are required to ensure that impacts to the resources are minimized. The field office negotiates with energy and mining development companies to avoid disturbing critical wildlife habitat, including sage grouse breeding habitat, during development activities. However, mining and energy development activities cannot be prevented due to concerns over impacts to wildlife species that are not federally listed as threatened or endangered.

Winnemucca Field Office policy/decision: Sonoma/Gerlach MFP III 1982. Little energy development has occurred in the Winnemucca Resource Area. However, there are 5 proposed wind energy sites within the Massacre PMU. Field Office policy is to consult with state wildlife agencies when developing site plans for energy and mining activities. Bonds for restoration of sites and/or to mitigate site impacts are required to ensure that impacts to the resources are minimized. The field office negotiates with energy and mining development companies to avoid disturbing critical wildlife habitat, including sage grouse breeding habitat, during development activities. However, mining and energy development activities cannot be prevented due to concerns over impacts to wildlife species that are not federally listed as threatened or endangered.

Risk #6: Conversion of forb dominated meadows to mat grass-dominated meadows

Season/Habitat affected: Brood-rearing

Contributing Management Action: Underutilization and/or lack of fire in meadows
Risk Rating: Low

There are about 1,500 acres (500 private, 1000 public) of riparian vegetation dominated communities in the Surprise Resource Area portion of the Massacre PMU. The only area in the PMU, which is unallotted to both livestock and wild horses is the 3,800 acres allotted to bighorn sheep north of Hays Canyon. This area does not have any known riparian meadows. The remainder of the PMU is allocated to livestock and/or wild horses, and is grazed during the growing season at least one year in three. Riparian areas within these areas generally receive significant levels of utilization. This use ensures that meadows do not become mat grass dominated communities. Within the areas allocated to livestock and wild horse grazing, about 725 acres of meadows are inside livestock/wild horse exclosures. Of this, about 620 acres have the potential to become mat grass dominated meadows. However, due to periodic livestock and/or wild horse grazing (downed fences and gates left open); only about 80 acres (5% of the riparian areas in the PMU) are currently dominated by mat grass communities. Therefore, the risk of converting significant portions of the meadows in the Massacre PMU to mat grass dominated communities is low.

Table #2: Meadow Exclosures

Location	Acres	Condition
Massacre Ranch	56	Mostly ephemeral
Stevens Camp	178	Could get mat vegetation, but often breached
Pole Corral	68	Could get mat vegetation, but often breached
Upper High Rock	79	Could get mat vegetation, but often breached
Grassy Rock Spring	1	Tight
Pipe Spring	12	Tight, some mat grass
Claim Spring	5	Tight, some mat grass
Harness Spring	3	Tight, some mat grass
6300 Spring	10	Tight, but has been grazed
Lower Indian Spring	25	Ephemeral
Paso Spring	160	Could get mat vegetation, but often breached
Jackknife Spring	1	Breached, grass forb
Little Indian Spring	3	Tight, mostly ephemeral
Mapline Spring	1	Breached
Findman Spring	1	
Lower Rock Spring	2	
Outcrop Spring	1	Ephemeral and rocky
Lost Dog Meadow	50	Has areas of mat grass veg
Talus Spring	1	Rocky and shallow soil
PWR Spring	1	
Clover Creek	12	Could get mat vegetation, but often breached
Lower Meadow	3	
Summit Spring	2	Ephemeral and rocky
Buttercup Spring	3	Has areas of mat grass veg
Chicken Spring	3	
Glacier Spring	1	
Hog Mtn Spring	1	
Scarlet Spring	2	
Upper Kissler Spring	3	Mostly ephemeral, gets some grazing, juniper
Quill Spring	2	Is a mat grass meadow. Adjacent meadows get heavy grazing, basin is full of juniper
Wildhorse Spring	1	Ephemeral
Seeding Springs	3	Could get mat vegetation, but often breached
Little Weimer Spring	31	Could get mat vegetation, but often breached
	725	

There are approximately 300 acres of lentic and lotic riparian systems (100 private, 200 public) in the Winnemucca Field Office portion of the Massacre PMU. Available vegetation in the Winnemucca Field Office portion of the Massacre PMU is allocated to livestock, wildlife, and/or wild horses/burros. Riparian areas within these areas generally receive significant levels of utilization. This use ensures that meadows do not become mat grass dominated communities. Therefore, the risk of converting significant portions of the meadows in the Massacre PMU to mat grass dominated communities is low.

Comment [s1]: Rodger look over

Winnemucca Field Office Exclosure List*

Location	Acres

Rocky Basin	**9.6**
Donnely Creek Meadow	**3**
Donnely Creek Headwaters	**1**
Donnely Creek	**1.5**
Buck Basin Spring #2	**1.5**
Dry Lake Meadow	**8**
Cain Spring	**3**

*** Not all of the riparian areas within the Winnemucca Field Office are fenced, and private portions of riparian areas are unknown.**

Conservation Measure(s): *In areas that have the potential to produce mat grass meadows and that are currently not allotted to livestock or horses, prescriptive graze or burn.*
Responsible Parties: BLM
Monitoring: *Set up photo-points and revisit every 3-5 years for areas that are grazed, every year for areas that are burned.*

Conservation Measure(s): *Where appropriate, reintroduce fire onto landscape.*
Responsible Parties: BLM
Monitoring: *Set up photo-points and revisit every year up to five years after burn, GPS fire size to track any changes.*

WAFWA Guideline: (See Appendix #1). 21 See discussion under Risk #3.

Risk #7: Conversion of meadows to bare ground
Season/Habitat affected: Brood-rearing

Contributing Management Action: Over utilization of meadows
Risk Rating: Medium

Of the 1,500 acres (500 private, 1000 public) of riparian vegetation dominated communities in the Surprise Resource Area portion of the Massacre PMU, about 663 acres (about 45% of the riparian communities) receive periodic heavy use that exposes some bare soil in the riparian system. Management is in place to mitigate this level of use on about 600 of these acres, including establishing wild horse appropriate management levels, interim decisions with riparian stubble height requirements, additional exclosures, deferred use, periodic rest, and early turnoff for regrowth. Most AMPs call for maintaining greater than 90% ground cover on meadows, horse plans recognize the significance of season-long wild horse use on meadows, and Rangeland Health Assessments are picking up the areas (and addressing the causes) where use to bare ground on meadows is still occurring. About 63 acres of riparian communities, primarily in portions of allotments used by livestock and wild horses and on allotments used season-long, continue to receive annually high levels of use with no mitigation. Therefore, the risk of converting meadows to bare ground is moderate.

Of the 300 acres of lentic and lotic riparian systems (100 private, 200 public) in the Winnemucca Field Office portion of the Massacre PMU, approximately 75% (225 acres) receives periodic heavy use that exposes some bare soil in the riparian system. Management is in place to mitigate this level of use on all of these areas, including establishing wild horse/burro appropriate management levels, interim decisions with riparian stubble height requirements, additional exclosures, deferred use, periodic rest, and early turnoff for regrowth. Wild horse/burro plans recognize the significance of season-long wild horse/burro use on meadows, and Rangeland Health Assessments are picking up the areas (and addressing the causes) where use to bare ground on meadows is still occurring. Therefore, the risk of converting meadows to bare ground is moderate.

Comment [rb2]: Need to include the Winnemucca portion.

Conservation Measure(s): *Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately.*

Responsible Parties: BLM
Monitoring: *Establish photo-points and green-lines if not already in place and revisit every 3-5 years. Implement stubble-height and soil alteration limitations and measure several times each season for compliance.*

WAFWA Guideline: (See Appendix #1). 21 See discussion under Risk #3.

Risk #8: Conversion of meadows to upland vegetation

Season/Habitat affected: Brood-rearing

Contributing Management Action: Reduced hydrologic functionality due to head cutting, soil alteration (roads, heavy grazing), confinement of floodplain (roads, compaction).
Risk Rating: High

Eleven of the sixteen allotments within the Surprise Field Office portion of the Massacre PMU have had Rangeland Health Assessments performed for them since 1999. Three had no assessable stream reaches and one, Bicondoa, had no riparian wetlands. All but one allotment either met or was progressing towards standards for stream health. The Duck Lake and Highway allotments did not meet standards for stream health nor were they making progress to those ends. This finding was due to the amount of eroding stream banks, early seral vegetation, and active head cutting found in the streams assessed. These allotments also did not meet standards nor were found to be progressing towards standards for riparian wetlands for similar reasons. No allotments were found to be meeting the standards for stream health. The remaining allotments were not found to be meeting standards for riparian wetlands but were progressing towards them.

Most meadows and springs have roads to or through them, and most drainages have roads along them, most meadows receive proportionately heavier/longer duration use than adjacent uplands. Inherent rockiness and ephemeral nature of many systems helps to offset the risk. Management is in place to address over utilization/compaction by livestock and wild horses. This is evident in the upward, though slow, trends seen along most streams and riparian areas. Roads, especially in drainages, continue to impact systems (and are politically/logistically difficult to close or re-route). In the short-term, the potential for conversion from meadows to uplands is therefore considered high.

There are four allotments within the Winnemucca Field Office portion of the Massacre PMU have had Rangeland Health Assessments performed for them since 1999.

Comment [rb3]: We have not completed "Rangeland Health Assessments", but we have completed Allotment Evaluations on 3 of the 4.

Most meadows and springs within the Winnemucca Field Office portion of the Massacre PMU have roads to or through them, and most drainages have roads along them, most meadows receive proportionately heavier/longer duration use than adjacent uplands. Inherent rockiness and ephemeral nature of many systems helps to offset the risk. Management is in place to address over utilization/compaction by livestock and wild horses. Roads, especially in drainages, continue to impact systems (and are politically/logistically difficult to close or re-route). In the short-term, the potential for conversion from meadows to uplands is therefore considered high.

Conservation Measure(s): *Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Do not build new roads in riparian areas, where a problem consider relocating.*
Responsible Parties: BLM, permittees.
Monitoring: *Establish photo-points and green-lines if not already in place and revisit every 3-5 years. Implement stubble-height and soil alteration limitations and measure several times each season for compliance. Conduct RHA's 1 year in 15, and Proper Functioning Condition (PFC) as needed.*

WAFWA Guidelines: (See Appendix #1). 21 See discussion under Risk #3; 22.

22. ["Avoid removing sagebrush within 300 m of sage grouse foraging areas along riparian zones, meadows, lakebeds, and farmland, unless such removal is necessary to achieve habitat management objectives (e.g., meadow restoration) "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Cowhead/Massacre LUP, General Decision #16, C, 1(b) - Leave 100 yard buffer zones around meadows and along drainages. Tuledad/Home Camp LUP, Wildlife Decision #9 - Prohibit all vegetation manipulation within two miles of sage grouse strutting areas and within 100 yards of any meadow or stream.

Surprise and Winnemucca Field Office policies are to leave 100-yard buffer zones around meadows and streams to maintain wildlife (primarily sage grouse) hiding cover. Exceptions to this policy occur where fuels management and structure protection require sagebrush reduction less than 100 yards from riparian zones, and where riparian zones have been converted to upland sagebrush habitat that may be recovered to riparian vegetation with proper manipulation and management.

Risk #9: Insufficient stubble for successful nesting cover

Season/Habitat affected: Nesting

Contributing Management Action: Short-term over utilization.
Risk Rating: Medium to High

All of the allotments in the Massacre PMU have livestock utilization criteria of moderate (40%-60%) or less. See Appendix #2: Cowhead/Massacre Planning Unit, General Decision #3; and Livestock Utilization Criteria table; also see Leadville Allotment FMUD 1994, Buffalo Hills FMUD 1993, Soldier Meadows Allotment FMUD 1994, Coyote Allotment AMP 1973, and Sonoma/Gerlach MFP III 1982.

There are four wild horse herd areas covering 272,900 acres (35% of Surprise Resource Area portion of the Massacre PMU). All are over Appropriate Management Levels. The total number of wild horses in the PMU should be between 243 and 426. The actual number of horses is approximately 834. All four-herd areas are scheduled to be gathered in fall of 2004, by which time it is expected that numbers will have increased to approximately 1,200 horses. As horse numbers increase, use levels in wild horse concentration areas will also increase, resulting in locally heavy use, particularly near water sources and in spring/summer use areas within the four herd management areas.

There are three wild horse herd management areas and one wild horse/burro herd management area covering 338,531 acres (73% of Winnemucca Field Office portion of the Massacre PMU). All are over Appropriate Management Levels. The total number of wild horses/burros in the PMU should be 1081 horses and 24 burros. The actual number of horses is approximately 1835 head and approximately 47 burros. All four-herd management areas are scheduled to be gathered in fall of 2004/winter 2005 if budget permits. As horse/burro numbers increase, use levels in wild horse/burro concentration areas will also increase, resulting in locally heavy use, particularly near water sources and in spring/summer use areas within the four herd management areas.

Table #3: Wild Horses

Wild Horse Herd Area	Acres	AML	Actual (2002)	Estimated Population by Next Gather (Fall 2004)
Nut Mountain	40,200	30-55	87	125

Wall Canyon	41,100	15-25	40	58
Fox-Hog	97,000	120-226	480	691
High Rock	94,600	78-120	227	327
Total	**272,900**	**243-426**	**834**	**1,201**

Winnemucca Field Office Wild Horse and Burro Attachment to Table #3

Wild Horse/Burro Herd Management Area	**Acres**	**AML**	**Estimated Population (2003)**	**Estimated Population (2004)**	**Estimated Population by Next Gather in (2005)**
Warm Springs Canyon	79,857	175H/24B	337H/47B	388H/52B	446H/58B
Calico Mountain	153,284	334	485	558	642
Granite Mountain	103,657	258	601	691	795
Buffalo Hills*	1733	314	412	474	545
Total	**338,531**	**1081H/24B**	**1853H/47B**	**2111H/52B**	**2428H/58B**

*Only a small portion of the Buffalo Hills HMA falls within the Massacre PMU, which has been calculated to equal the acres noted above; total acres of the Buffalo Hills HMA are 131,861. A separate AML has not been calculated for the small portion of the Buffalo Hills HMA within the Massacre PMU.

Moderate use on grasses in the mid and lower elevations may not provide sufficient cover for nesting sage grouse. Dominant grasses at these lower elevations do not usually grow as tall as species on higher elevations, and 40% to 60% use may not leave the 7 inches (18 cm) of herbaceous cover recommended in WAFWA Guideline 5. Some of the mid and lower elevations in the PMU do retain 7" of herbaceous cover, at least every other year. These are areas with healthy native understories which are used lightly or which are rested from livestock use every other year and which do not have wild horses. See Appendix #2.

However, most pastures have areas in which livestock and/or wild horses tend to congregate and use is higher. To address this problem of livestock distribution, water has been developed throughout the Surprise and Winnemucca Field Office portions of the Massacre PMU to the point that there are few areas over a mile from the nearest livestock water source. In addition, most allotments have specific criteria, which prohibit the use of salt on springs, meadows, streams, and in aspen stands. See Appendix #2: Cowhead/Massacre Planning Unit, General Decision #4; Wall Canyon East and Home Camp AMPs; Massacre Mtn AOP; Bare MUD also see Leadville Allotment FMUD 1994,

Buffalo Hills FMUD 1993, Soldier Meadows Allotment FMUD 1994, Coyote Allotment AMP 1973, and Sonoma/Gerlach MFP III 1982.

Conservation Measure(s): *Temporary livestock exclusion (rest), change in livestock and horse use period or intensity of use, changes in salting or watering use areas.*
Responsible Parties: BLM, permittees
Monitoring: *Use of utilization and stubble-height limitations, which are measured throughout the grazing season.*

WAFWA Guidelines: (See Appendix #1). 5 See discussion under Risk #1; 10.

10. ["During drought periods (>2 consecutive years), reduce stocking rates or change management practices for livestock, wild horses and wild ungulates if cover requirements during the nesting and brood rearing periods are not met. Grazing pressure from domestic livestock and wild ungulates should be managed in a manner that, at all times, addresses the possibility of drought "(Connelly et al. 2000).]

Surprise Field Office policy/decision: The field office does not currently have a resource area wide policy that addresses methods for changing management practices for livestock, wild horses, and wild ungulates in the event of drought. The resource area is in the Great Basin where "below normal" amounts of precipitation are the rule rather than the exception. As a result, the wild ungulate population is adapted to cyclical drought events, and it is currently not managed in response to drought. In addition, established livestock stocking rates and wild horse appropriate management levels are conservative, and they are usually compatible with meeting resource needs during periods of mild drought.

However, during periods of severe extended drought (generally considered to be less than 70% of median for 2 or more consecutive years), there is no systematic method for determining needed management changes. Wild ungulates, and, in extreme cases, wild horses will self-regulate numbers during periods of drought by experiencing "die-offs", especially during hard winters following dry growing seasons. Decisions to implement livestock and wild horse number reductions and livestock management changes are made on a case-by-case basis, during the summer. The decisions are generally based on lack of livestock and wild horse water, which leads to heavy localized concentrations of use and poor stock conditions, rather than on cover requirements for sage grouse nesting and brood rearing. In areas where stock water exists only at marginal sources (reservoirs and ephemeral springs), periods of mild to moderate drought may actually result in more nesting cover the following season because larger areas are inaccessible to livestock and wild horses.

Winnemucca Field Office policy/decision: The field office does not currently have a policy that addresses methods for changing management practices for livestock, wild horses/burros, and wild ungulates in the event of drought. The Field Office is in

the Great Basin where “below normal” amounts of precipitation are the rule rather than the exception. As a result, the wild ungulate population is adapted to cyclical drought events, and it is currently not managed in response to drought. In addition, established livestock stocking rates and wild horse/burro appropriate management levels are conservative, and they are usually compatible with meeting resource needs during periods of mild drought.

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Risk #10: Low vigor herbaceous vegetation resulting in poor nesting cover and spring forage

Season/Habitat affected: Nesting and brood-rearing

Contributing Management Action: Lack of fire/brush disturbance in mountain big sagebrush sites.
Risk Rating: Medium

Conservation Measure(s): *Use prescribed fire, mechanical, or chemical disturbance, or change grazing prescription. Reseed where necessary with adapted species.*
Responsible Parties: BLM, permittees
Monitoring: *Establish photo-points and revisit every 3-5 years, establish long-term trend transects and revisit 1 year in 10.*

Contributing Management Action: Long-term over utilization
Risk Rating: Medium

Conservation Measure(s): *Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately.*

Responsible Parties: BLM, permittees
Monitoring: *Establish utilization standards and monitor 1 year in every 3, establish long-term trend transects and revisit 1 year in 10.*

Contributing Management Action: Annual, long duration use in the spring (March, April, and May)
Risk Rating: Medium

Conservation Measure(s): *Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately.*

Responsible Parties: BLM, permittees
Monitoring: *Establish utilization standards and monitor 1 year in every 3, establish long term trend transects and revisit 1 year in 10.*

Contributing Management Action: Noxious weed and/or cheatgrass encroachment
Risk Rating: Medium

Conservation Measure(s): *Aggressively treat noxious weeds and other invasive plants where they threaten quality of sage grouse habitat.*
Responsible Parties: BLM, local counties
Monitoring: *Monitor treatments annually until controlled, use GPS to monitor patch size.*

There is no lack of disturbance in mountain sagebrush communities from livestock. Grazing occurs in all sagebrush communities but occurs later in mountain sagebrush depending on the allotment topography, grazing system, and location of water. Fire suppression is high throughout the Surprise and Winnemucca Field Offices and therefore in all sagebrush types.

All of the allotments in the Massacre PMU have livestock utilization criteria of moderate (40%-60%) or less. In the past, historic livestock grazing practices that removed the understory vegetation contributed to the establishment of cheatgrass. All allotments met Rangeland Health Assessment standards for upland soils and most met the standards for biodiversity, at least on the uplands (about 36% of allotments did not meet standards for biodiversity in their riparian areas). Those that did not meet the diversity standards were generally due to lack of woody riparian species in areas that could support them.

The risk of conversion of sagebrush communities with weak understories to annual herbaceous communities as a result of fire is high. Approximately 10% (65,872 acres) of the Surprise Field Office and 10% (46,671 acres) of the Winnemucca Field Office

portions of the Massacre PMU have the potential to be dominated by cheatgrass**.** Cheatgrass is a strong component of the understory on many of the lowest elevations, and it is very competitive with native herbaceous vegetation, especially when these areas burn. The risk of conversion of sagebrush communities to noxious weeds, however, is moderate. The seed source and vectors to transport seed (roads, vehicles, livestock, wind, and water) are here. However, the type of noxious weeds which tend to occupy sagebrush habitat generally require significant soil disturbance, such as that found along roads and heavily used livestock/wild horse trails, around livestock/wild horse watering sites, and around mines, excavations, agricultural sites, and project developments.

WAFWA Guidelines: (See Appendix #1). 1, 5, 6, 7, 8, 11, 13, 14, 18, 19, 20, 29, 32, and 33 See discussion under Risk #1; 16 and 21 See discussion under Risk #3; 10 See discussion under Risk #9; 15, 25, and 26

15.["Where the sagebrush overstory is intact but the understory has been severely degraded and quality of nesting habitat has declined (Table 3), use appropriate techniques (e.g., brush beating in strips or patches and interseed with native grasses and forbs) that retain some sagebrush but open shrub canopy to encourage forb and grass growth "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Cowhead/Massacre LUP, Decision #16 C, 3(c) and 4(c) allow for vegetation treatments where conditions will not improve under other types of management in a reasonable time. Experiments, using spraying and small-scale brush beating on sites with severely degraded understories, are currently planned on the Home Camp Allotment to determine if such treatment can recover native herbaceous understories. Widespread treatment is not planned due to ongoing concerns that treatment may result in invasive species (such as rabbit brush, cheatgrass and noxious weeds) becoming dominant on these sites.

Winnemucca Field Office policy/decision: Sonoma/Gerlach MFP III 1982 allows for vegetation treatments where conditions will not improve under other types of management in a reasonable time. Experiments, using spraying and small-scale brush beating on sites with severely degraded understories, are currently planned but not within the Massacre PMU portion of the Winnemucca Field Office. Widespread treatment is not planned due to ongoing concerns that treatment may result in invasive species (such as rabbit brush, cheat grass and noxious weeds) becoming dominant on these sites.

25.["Use brush beating or other mechanical treatments in strips 4-8 m wide in areas with relatively high shrub canopy cover (>35% total shrub cover) to improve late brood-rearing habitats. Brush beating can be used to effectively create different age classes of sagebrush in large areas with little age diversity (Connelly et al. 2000).]

26.["If brush beating is impractical, use fire or herbicides to create a mosaic of openings in mountain big sagebrush and mixed shrub communities used as late brood-rearing

habitats where total shrub cover is >35%. Generally, 10-20% canopy cover of sagebrush and <25% total shrub cover will provide adequate habitat for sage grouse during summer "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Response to 25 and 26. A relatively small percentage (<25%) of the upland soils in the Surprise Resource Area portion of the PMU are capable of producing vegetative communities with more than 35% total ground cover, at their most productive. By the time sagebrush alone occupies 35% ground cover, even the most productive of these sites is out of balance with ecological site objectives, and the herbaceous understory is weakened. With the exception of non-native species seedings, land treatments in the Surprise Field Office portion of the Massacre PMU are conducted with the objective of maintaining or restoring ecological site conditions. Ideally, land treatments should be conducted before the herbaceous understory is reduced to the point that the site is susceptible to noxious weeds or re-seeding is necessary. The few land treatments currently conducted in the resource area are relatively small in size, and all consider site-specific impacts on sage grouse seasonal habitat needs. The timing, size, and pattern of treatment are adjusted to minimize short-term impacts on sage grouse, and other wildlife habitat.

Winnemucca Field Office policy/decision: Response to 25 and 26. A relatively small percentage (<25%) of the upland soils in the Winnemucca Field Office portion of the PMU are capable of producing vegetative communities with more than 35% total ground cover, at their most productive. By the time sagebrush alone occupies 35% ground cover, even the most productive of these sites is out of balance with ecological site objectives, and the herbaceous understory is weakened. With the exception of non-native species seedings, land treatments in the Winnemucca Field Office portion of the Massacre PMU are conducted with the objective of maintaining or restoring ecological site conditions. Ideally, land treatments should be conducted before the herbaceous understory is reduced to the point that the site is susceptible to noxious weeds or re-seeding is necessary. The few land treatments currently conducted in the resource area are relatively small in size, and all consider site-specific impacts on sage grouse seasonal habitat needs. The timing, size, and pattern of treatment are adjusted to minimize short-term impacts on sage grouse, and other wildlife habitat.

Risk #11: Lack of understory for sage grouse nesting cover and spring forage

Season/Habitat affected: Nesting and brood-rearing

Contributing Management Action: Lack of fire/disturbance in Wyoming and Lahontan big sagebrush communities
Risk Rating: Low to Medium

Conservation Measure(s): *Change grazing prescription to meet goals.*

Responsible Parties: BLM, permittees
Monitoring: *Establish photo-points and long term trend transects. Revisit photo-points every 3-5 years and trend transects every 1 in 10 years.*

Contributing Management Action: Historic over utilization
Risk Rating: Medium to High

Conservation Measure(s): *Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately. Brush beating, mechanical or other disturbance or re-seeding are also options. Thin sagebrush using methods shown to be effective for ecological site.*
Responsible Parties: BLM, permittees
Monitoring: *Establish utilization standards and monitor every 1-year in 3, establish long-term trend transects and revisit 1 year in every 10.*

Although there is an overall lack of fire disturbance on the Surprise and Winnemucca Field Offices, grazing has been present in moderate to high amounts for many years. Reasons for the "lack" of disturbance from fire is due to the low number of ignitions, high initial attack response, and relatively small fire size (most less than 1 acre in size). Fires in Wyoming big sage sites are often in easier to reach and combined with the knowledge that these sites can easily convert to solid cheatgrass, receive high priority for suppression. For this reason, as well as the high cost of rehabilitation, fire is not often prescribed for these sites. Higher elevation sites with strong native understories are a better use of time and money. Lahontan sagebrush sites, like other low sage sites, typically do not burn as well due to lower amounts of herbaceous plant material. This of course depends on site conditions, as Lahontan is often intermediate in size and function to low and Wyoming sagebrush types. Due to the low numbers of fires within the PMU, the risk of this type of disturbance not creating additional high quality cover and forage is moderate.

While past over utilization has occurred in the Massacre PMU and lead to problems in vigor in some areas, current management has addressed most of the problems and future RHA's will address additional areas if needed. Due to Wyoming's location on the landscape, grazing provides moderate to high disturbance on those sites. The risk that current grazing is contributing to low amounts of cover and forage, however, is rated as moderate.

WAFWA Guidelines: (See Appendix #1). 1, 6, 7, 8, 11, 13, 14, 19, 29, 32, and 33 See discussion under Risk #1; 17 See discussion under Risk #2; 16 and 21 See discussion under Risk #3; 10 See discussion under Risk #9; 15, 25, and 26 See discussion under Risk #10.

Risk #12: Low density or lack of appropriate insects for early brood rearing forage

Season/Habitat affected: Brood-rearing

Contributing Management Action: Lack of diverse habitats for favorable insects (i.e. strong, native grass and forb understories).
Risk Rating: Low

There is little information beyond a short list of known insects found in the diet of sage grouse to predict necessary densities for brood rearing sage grouse. It is assumed that if the necessary sage grouse habitats exist and are in relatively "good health" then there should be no limiting factors for the insects that sage grouse need. At the moment, although there does not appear to be a lack of appropriate habitats for brood rearing although there is always a debate as to the "health" of those habitats, e.g. riparian and other wet areas. Although many allotments did not meet standards for riparian/wetland or stream health, they did meet their biodiversity standards. Considering also the lack of scientific literature on this topic, this risk is currently rated as low for the Massacre PMU.

Conservation Measure(s): *Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately.*

Responsible Parties: BLM, permittees
Monitoring: *Establish utilization standards and monitor every 1 year in 3, establish long term trend transects and revisit 1 year in every 10.*

WAFWA Guidelines: (See Appendix #1). 1, 6, 7, 8, 11, 13, 14, 19, 29, and 33 See discussion under Risk #1; 17 See discussion under Risk #2; 16 and 21 See discussion under Risk #3; 10 See discussion under Risk #9; 15, 25, and 26 See discussion under Risk #10.

Risk #13: Lack of access to water

Season/Habitat affected: Brood-rearing

Contributing Management Action: Spring developments that capture all water and are inaccessible to sage grouse.
Risk Rating: Low

Conservation Measure(s): *Construct new spring developments to maintain their free-flowing characteristics, install wildlife escape ramps in new water troughs, retrofit existing troughs with wildlife escape ramps.*
Responsible Parties: *BLM*

Monitoring: *Establish project inspections and revisit projects every 5 years.*

Contributing Management Action: Recreational camping at water.
Risk Rating: Low

Conservation Measure(s): *Prohibit development of new campgrounds in riparian or wet meadow areas, apply (as necessary) seasonal or area closures in key sage-grouse areas.*
Responsible Parties: BLM, NDOW, local counties
Monitoring: *Opportunistic law enforcement patrols.*

Recreation is well dispersed, and camping is generally short-term. Spring developments on the Surprise and Winnemucca Field Offices are constructed so as not to capture all the available water or are constructed to allow overflow back onto the riparian zone. Accessibility to all wildlife is a prime consideration in construction of all spring developments and placement of troughs; however, many spring developments are in some state of disrepair. The current risk due to lack of access to water is therefore considered low, however, some spring developments do need maintenance.

WAFWA Guidelines: (See Appendix #1). 22 See discussion under Risk #8; 24, 27, and 28.

24. ["Avoid developing springs for livestock water, but if water from a spring will be used in a pipeline or trough, design the project to maintain free water and wet meadows at the spring. Capturing water from springs using pipelines and troughs may adversely affect wet meadows used by grouse for foraging (Connelly et al. 2000).]

Surprise Field Office policy/decision: Most of the springs with the potential to be developed for livestock water have already been developed. The majorities of these springs have water and wet meadow habitat available at the spring source. However, large portions of spring developments in the resource area are in poor repair. Spring exclosure fences are frequently down, and livestock and wild horses trample the meadows and foul spring source waters every year. Pipeline shut-off float valves are usually located in the troughs. If they are not shut off in the winter, they freeze and break. If they are not protected from livestock, they are broken. When the shut-off valves are broken, water continues to flow to the trough and over the top causing more water to be removed from the spring source meadows than is necessary to water livestock. Maintenance of projects in livestock grazing allotments, including most water developments, is the responsibility of the livestock operators. However, enforcement of maintenance responsibilities has been lax in the Surprise Resource Area.

Winnemucca Field Office policy/decision: Most of the springs with the potential to be developed for livestock water have already been developed. The majorities of these springs have water and wet meadow habitat available at the spring source. However, large portions of spring developments in the resource area are in poor

repair. Spring exclosure fences are frequently down, and livestock and wild horses/burros trample the meadows and foul spring source waters every year. Pipeline shut-off float valves are usually located in the troughs. If they are not shut off in the winter, they freeze and break. If they are not protected from livestock, they are broken. Once the shut-off valves are broken, water continues to flow to the trough and over the top, causing more water to be removed from the spring source meadows than is necessary to water livestock. Maintenance of projects in livestock grazing allotments, including most water developments, is the responsibility of the livestock operators. However, enforcement of maintenance responsibilities has been lax in the Winnemucca Field Office.

27. ["Only construct water developments for sage grouse in or adjacent to known summer use areas and provide escape ramps suitable for all avian species and other small animals. Water developments and "guzzlers" may improve sage grouse summer habitats (Autenrieth et al. 1982, Hanf et al. 1994). However, sage grouse used these developments infrequently in southeastern Idaho because most were constructed in sage grouse winter and breeding habitat, rather than summer range (Connelly and Doughty 1989)(Connelly et al. 2000).]

Surprise Field Office policy/decision: Water has not been developed specifically for sage grouse in the Surprise Resource Area. Water is available and fairly well distributed throughout most of the areas used by sage grouse in the summer, in the form of springs, streams, and livestock troughs and reservoirs. Escape ramps, suitable for use by birds and small mammals, are placed in all livestock troughs. Most of the guzzlers in the resource area were constructed for use by chukar and bighorn sheep. All are accessible to sage grouse, though few of the chukar guzzlers are in sage grouse summer use areas.

Winnemucca Field Office policy/decision: Water has not been developed specifically for sage grouse in the Winnemucca Field Office. Water is available and fairly well distributed throughout most of the areas used by sage grouse in the summer, in the form of springs, streams, and livestock troughs and reservoirs. Escape ramps, suitable for use by birds and small mammals, are placed in all livestock troughs. Most of the guzzlers in the Field Office were constructed for use by chukar and bighorn sheep. All are accessible to sage grouse, though few of the chukar guzzlers are in sage grouse summer use areas.

28. ["Whenever possible, modify developed springs and other water sources to restore natural free-flowing water and wet meadow habitats (Connelly et al. 2000).]

Surprise Field Office policy/decision: The majority of developed springs in the resource area have water and wet meadow habitat available at the spring source. Proper maintenance of spring developments should ensure that wet meadow habitat at the source is in good condition, and that a maximum amount of natural water flows from the source. The opportunity exists to move shut off valves from the

trough to the spring head box on some developments. This would prevent problems of valves freezing and being broken, which would retain more water at spring sources.

Winnemucca Field Office policy/decision: The majority of developed springs, in the Field Office, have water and wet meadow habitat available at the spring source. Proper maintenance of spring developments should ensure that wet meadow habitat at the source is in good condition, and that a maximum amount of natural water flows from the source. The opportunity exists to move shut off valves from the trough to the springhead box on some developments. This would prevent problems of valves freezing and being broken, which would retain more water at spring sources.

Factor: Disturbance

Risk #14: Human activity during breeding and nesting, or at watering sites

Season/Habitat affected: All

Contributing Management Action: Mining
Risk Rating: Low

Conservation Measure(s): *During breeding season, surface occupancy within 0.5 km (0.3 miles) of active breeding sites (leks) should be avoided. Avoid energy or mineral associated facilities within 3.2 km (2 miles) of leks. Off site mitigation may be considered in evaluating minerals activities on a case-by-case basis.*
Responsible Parties: BLM
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Contributing Management Action: Roads
Risk Rating: Medium

Conservation Measure(s): *Except in emergency situations, limit activities in known/occupied sage grouse habitat to avoid adverse impacts related to rights-of-way. Do not authorize new rights-of-way within 3.2 km (2 miles) of leks.*
Responsible Parties: BLM, State transportation agencies
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Contributing Management Action: Urban expansion
Risk Rating: Low

Conservation Measure(s): *Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.*
Responsible Parties: BLM, local and state governments
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Contributing Management Action: Recreation
Risk Rating: Low

Conservation Measure(s): *Prohibit development of new campgrounds in riparian or wet meadow areas, apply as necessary seasonal or area closures in key sage-grouse areas.*
Responsible Parties: BLM, local counties
Monitoring: *Monitor leks a minimum of 2 years in 5. Opportunistic law enforcement patrols.*

There is little mining activity occurring in the Surprise and Winnemucca Field Office portions of the Massacre PMU. Private lands are mostly uninhabited. Recreational activities are widely dispersed and low impact. Sage grouse breeding and early nesting areas are largely inaccessible during active periods due to weather and road conditions. Therefore, there is a low risk of disturbing sage grouse during breeding and nesting, or at watering sites as a result of mining, roads, urban expansion, and recreation. See also discussion under Risk #5.

WAFWA Guidelines: (See Appendix #1). N(b) and 12.

Additional WAFWA Guidance:

N(b). ["Viewing sage grouse on leks (and censusing leks) should be conducted in a manner that minimizes (or preferably eliminates) disturbance to birds (Call and Maser 1986). Agencies should generally not provide all lek locations to individuals simply interested in viewing birds. Instead, 1 to 3 lek locations should be identified as public viewing leks and, if demand is great enough, agencies should consider erecting 2–3 seasonal blinds at these leks for public use. Camping in the center of or on active leks should be vigorously discouraged"(Connelly et al. 2000).]

Surprise Field Office policy/decision: There has been little interest expressed by the general public in viewing sage grouse leks in the Surprise Resource Area. Most lek locations are difficult to access during active periods due to wet roads and snowdrifts. On the ground census work is carefully conducted to minimize disturbance to birds, and helicopter census work is infrequent. There is little to no camping occurring while sage grouse are using leks (too cold and wet), and most lek locations are not in areas that are highly desirable for camping later in the year (mostly low sagebrush flats with no shade or water).

Winnemucca Field Office policy/decision: There has been little interest expressed by the general public in viewing sage grouse leks in the Winnemucca Field Office portion of the Massacre PMU. Most lek locations are difficult to access during active periods due to wet roads and snowdrifts. On the ground census work is carefully conducted to minimize disturbance to birds, and helicopter census work is infrequent. There is little to no camping occurring while sage grouse are using

leks (too cold and wet), and most lek locations are not in areas that are highly desirable for camping later in the year (mostly low sagebrush flats with no shade or water).

12. ["Adjust timing of energy exploration, development, and construction activity to minimize disturbance of sage grouse breeding activities. Energy-related facilities should be located >3.2 km from active leks whenever possible. Human activities within view of or <0.5 km from leks should be minimized during the early morning and late evening when birds are near or on leks" (Connelly et al. 2000).]

Surprise Field Office policy/decision: Little energy development has occurred in the Surprise Resource Area. Field Office policy is to consult with state wildlife agencies when developing site plans for energy and mining activities. Bonds for restoration of sites and/or to mitigate site impacts are required to ensure that impacts to the resources are minimized. The field office negotiates with energy and mining development companies to avoid disturbing critical wildlife habitat, including sage grouse breeding habitat, during development activities. However, mining and energy development activities cannot be prevented due to concerns over impacts to wildlife species that are not federally listed as threatened or endangered.

Winnemucca Field Office policy/decision: Little energy development has occurred in the Winnemucca Field Office portion of the Massacre PMU. Field Office policy is to consult with state wildlife agencies when developing site plans for energy and mining activities. Bonds for restoration of sites and/or to mitigate site impacts are required to ensure that impacts to the resources are minimized. The field office negotiates with energy and mining development companies to avoid disturbing critical wildlife habitat, including sage grouse breeding habitat, during development activities. However, mining and energy development activities cannot be prevented due to concerns over impacts to wildlife species that are not federally listed as threatened or endangered.

Risk #15: Additional predator perch sites

Season/Habitat affected: All

Contributing Management Action: Juniper encroachment as a result of lack of fire/disturbance
Risk Rating: Medium

In the Surprise Resource Area portion of the Massacre PMU, 22,776 acres of sagebrush communities (approximately 3% of the PMU) have been encroached upon by juniper. This juniper is providing raptor perch sites, primarily in sage grouse nesting, brood rearing, and some lek habitats. The amount of this type of use in relation to canopy closure is currently unknown.

In the Winnemucca Field Office portion of the Massacre PMU, 5335 acres of sagebrush communities (approximately 1% of the PMU) have been encroached upon by juniper. This juniper is providing raptor perch sites, primarily in sage grouse nesting, brood-rearing, and some lek habitats. The amount of this type of use in relation to canopy closure is currently unknown.

Conservation Measure(s): *Use mechanical treatment or prescribed fire to reduce juniper.*
Responsible Parties: BLM, private landowners
Monitoring: *Establish photo-points and revisit 1 year in 5.*

Contributing Management Action: Pasture and allotment fences, spring exclosures, well structures, and troughs.
Risk Rating: Medium

Structures, including spring developments, water pipelines, troughs, wells, exclosures, guzzlers, holding fields, pasture and allotment fences, and private land fences, exist throughout the Massacre PMU. Structures are concentrated around reliable water sources, which frequently are private and/or have been developed for watering livestock on public lands. As a result, the risk of structures being used by raptors to hunt sage grouse is greatest later in the year, and on dry years when marginal water sources are unavailable.

Conservation Measure(s): *Construct new livestock facilities (troughs, fences, corrals) at least 0.6 miles from leks, restrict new water developments, use "perch guards" on fence posts and rock cribs, and construct future livestock exclosures large enough to minimize raptor predation.*
Responsible Parties: BLM
Monitoring: *Monitor leks a minimum of 2 years in 5, inspect projects 1 year in 5.*

Contributing Management Action: Transmission lines and communication sites
Risk Rating: Medium

One power line runs through the Surprise and Winnemucca Field Office portions of the Massacre PMU. There are 3 known leks in the Surprise Resource Area portion that are less than 3 km (1.8 miles) from the power line (additional 6 leks in Winnemucca managed portion). Two of the leks are believed to be active.

There are 2 communication sites in the Surprise Resource Area portion of the Massacre PMU (Fox Mountain and 49 Mountain). There are no known leks within 3 km of either site.

Until very recently, no applications for additional power lines or communication sites had been filed in the Surprise and Winnemucca Field Office for many years. In the spring of

2003, however, an application for the placement of wind generation test towers was filed for the Boot Lake Area, outside of the Massacre PMU. The closest known historic lek to this site is greater than 3 miles away and the closest active lek about 6 miles away. No known, or very little, sage grouse habitat exists at the proposed site. This site if approved to its final stages of a permanent set of towers could affect sage grouse habitat and predation via creation of additional roads and lines to relay power to the main power line in the Madeline Plains.

Conservation Measure(s): *Avoid placing new structures within 2 miles of leks (try to place near existing corridors), avoid visiting sites near leks at dawn or dusk during breeding season, on a case-by-case basis off site mitigation may be considered.*
Responsible Parties: BLM, California and Nevada Public Utilities Commissions (CPUC and NPUC).
Monitoring: *Monitor leks a minimum of 2 years in 5.*

WAFWA Guidelines: (See Appendix #1). 3; 4

3. ["Increase the visibility of fences and other structures occurring within 1 km of seasonal ranges by flagging or similar means if these structures appear hazardous to flying grouse (e.g., birds have been observed hitting or narrowly missing these structures or grouse remains have been found next to these structures) "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Surprise Field Office policy is to flag all fences during construction to increase their visibility to all species of wildlife (particularly pronghorn antelope, mule deer, and sage grouse) and wild horses. Flagging generally lasts for a year or two, by which time wildlife populations are accustomed to the fence location and generally avoid injury. Birds have never been observed hitting structures, and no remains have been found next to structures in the Surprise Resource Area.

Winnemucca Field Office policy/decision: Winnemucca Field Office policy is to flag all fences during construction to increase their visibility to all species of wildlife (particularly pronghorn antelope, mule deer, and sage grouse) and wild horses. Flagging generally lasts for a year or two, by which time wildlife populations are accustomed to the fence location and generally avoid injury. Birds have never been observed hitting structures, and no remains have been found next to structures in the Winnemucca Field Office.

4. ["Avoid building power lines and other tall structures providing perch sites for raptors within 3 km of seasonal habitats. If these structures must be built, or presently exist, the lines should be buried or poles modified to prevent their use as raptor perch sites "(Connelly et al. 2000).]

Surprise Field Office policy/decision: Surprise Field Office policy is to stay within the existing corridors and use existing sites to full capacity before authorizing additional sites and rights of ways for power lines and communication sites. The Surprise Field Office currently does not plan to require the existing power line be buried or made less accessible to raptors.

Winnemucca Field Office policy/decision: There is one power line within the Winnemucca portion of the Massacre PMU. The location of this power line is in Squaw Valley at the South western most portion of the PMU. This power line runs in a north to north west direction. There are approximately 20 miles of the power line that fall within the Winnemucca Field Office portion of the Massacre PMU. Winnemucca Field Office policy is to stay within the existing corridors and use existing sites to full capacity before authorizing additional sites and rights of ways for power lines and communication sites. The Winnemucca Field Office currently does not plan to require the existing power line be buried or made less accessible to raptors.

Comment [rb4]: I just cut and pasted this from the bottom to the top.

The Land Use Plans recognize the potential for additional communications site development on Hays Peak, Little Hat Mountain, and Mahogany Mountain (see Tuledad/Home Camp LUP, Lands decision #1 and Cowhead/Massacre LUP, Subunit #3, decision #13). Also see Sonoma/Gerlach MFP III 1982.
There are no known leks near Hays Peak or Little Hat Mountain, and there are two known leks within 3 km (1.8 miles) of Mahogany Mountain.

The location of leks is considered when any structure capable of providing raptor perch sites is proposed, including livestock control fences. Where possible, structures are kept as far away from leks as possible. When structures need to be closer than 3 km (1.8 miles) from known leks, other steps are taken to minimize their use by raptors, including keeping the structure out of sight of the lek with topography, minimizing wood posts, braces, and rock jacks, and adding spikes to steel fence posts to discourage raptor perching.

Risk #16: Artificially high predator population

Season/Habitat affected: All

Contributing Management Action: High speed roads, which increase the amount of road-killed animals and attract ravens.
Risk Rating: Low

Conservation Measure(s): *Do not authorize new rights-of- ways within 3.2 km (2 miles) of leks.*
Responsible Parties: BLM, NDOT
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Contributing Management Action: Urban expansion and ranchettes, which increase the amount of garbage and attract ravens.
Risk Rating: Low

Conservation Measure(s): *Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.*
Responsible Parties: BLM
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Contributing Management Action: Agricultural expansion, which increases the amount of food for ravens
Risk Rating: Low

Conservation Measure(s): *Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.*
Responsible Parties: BLM
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Private lands are mostly uninhabited with little chance of additional urban or agricultural expansion. With the exception of Nevada highways 34 and 8A (45 mph, gravel), roads in the Massacre PMU are mostly low speed. Therefore, there is a low risk of producing an artificially high predator population as a result of road kill, urban expansion, and agricultural expansion.

Risk #17: Human-caused (non-prescription) fire

Season/Habitat affected: All

Contributing Management Action: Dispersed recreation and roads.
Risk Rating: Low

Recreation and roads are widely dispersed throughout the Surprise and Winnemucca Field Offices. Since 1964, approximately 23% of fires greater than 1 acre in size and with known causes could be remotely attributed to recreation/road related issues. An additional 32 fires have been reported in the PMU that were less than or equal to 1 acre in size. Only one was due to a vehicle's exhaust. Combined, all fires have burned less than 2% of the Massacre PMU. Therefore, there is a low risk of disturbance to sage grouse as a result of accidental human caused fire associated with recreation and roads.

Conservation Measure(s): *Limit development of new roads into known/occupied sage-grouse habitat. Do not authorize new rights-of- ways within 2 miles of leks. Aggressive initial attack response to all fires.*
Responsible Parties: BLM, NDOT
Monitoring: *Annually, during fire season, use all available resources e.g., lookouts, ground spotters, lightning maps, to detect fires. Monitor lek sites at minimum 2 in 5 years.*

WAFWA Guidelines: (See Appendix #1). 19 See discussion under Risk #1.

Washoe - Modoc Sage Grouse Plan
Habitat Conservation Measures – Massacre PMU

The conservation measures below were identified in the Massacre PMU Habitat Risk Assessment, prepared for the Washoe – Modoc Sage Grouse Conservation Strategy. This is a first attempt at prioritizing conservation measures for sage grouse. Please refer to the documents "Massacre PMU Habitat Risk Assessment" and the "Sage Grouse Habitat Management Risks, Conservation Measures, and Monitoring Actions Massacre Population Management Unit Surprise Field Office BLM Managed Portion Only (in preparation)" for more information on risk factors and conservation measures, as identified by the habitat technical committee. Several known population priorities are also provided in bold italics.

Conservation Measures	Associated Risk Factors[1]
FIRST PRIORITIES	
Emergency rehabilitation measures after fire where needed. Use of native seed mix, including sagebrush and forbs appropriate to site, when possible to enhance sage grouse habitat. Keeping cows off for two growing seasons and other grazing management as needed to ensure meeting both overstory and understory objectives. Full suppression on R-0 sites (can shift to R-1 easily).	1) Temporary conversion of sagebrush to perennial herbaceous (R-1).
Emergency rehabilitation measures, site specific seeding or other treatment particularly on low elevation sites and/or south facing slopes. Increase priority for fire suppression and Emergency Site Rehabilitation (ESR) on R-2 sites to prevent shift to an R-4.	3) Conversion of sagebrush to annual herbaceous or noxious weeds(R-4).
Mechanical treatment or prescribed fire. Current planning efforts within the BLM, AMP revisions, current and projected rangeland projects.	4) Conversion of sagebrush to juniper (R-3)
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). No new roads in riparian areas, where a problem consider relocating. * Guideline 16 for utilization levels.	8) Conversion of meadows to upland vegetation.
Temporary livestock exclusion (rest), change in livestock and horse use period or intensity of use, changes in salting or watering use areas. * Standard 5 for biodiversity, Guidelines 5, 8,9,11,16.	9) Insufficient stubble for successful nesting cover
Annually, monitor bird numbers on leks.	9) Insufficient stubble for successful nesting cover
SECOND PRIORITIES	
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). * Standard 2 for Streams and 4 for Riparian and Wetland sites, Guideline 16 for utilization levels.	7) Conversion of meadows to bare ground.
Use of prescribed fire, mechanical or chemical disturbance, change in grazing prescription, and reseed where necessary with adapted species. * Standard 1 for upland soils and standard 5 for bio-diversity, Guidelines 5, 8,9,11,16.	10) Low vigor herbaceous vegetation (poor nesting cover & spring forage, (R-2).
Where livestock grazing results in utilization determined to be	

detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). * Standard 4 for Riparian and Wetland sites, and Standard 5 for Biodiversity, Guidelines 4, 8, 9,16.	10) Low vigor herbaceous vegetation (poor nesting cover & spring forage, (R-2).
Aggressively treat noxious weeds and other invasive plants where they threaten quality of sage grouse habitat. * Guideline 10 for control of noxious weeds which may include grazing or fire management.	10) Low vigor herbaceous vegetation (poor nesting cover & spring forage, (R-2).
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Brush beating, mechanical or other disturbance or re-seeding also options. Thin sagebrush using methods shown to be effective for ecological site. * Standard 5 for biodiversity, Guideline 11.	11) Lack of understory for sage grouse nesting cover and spring forage (R-2).
Except in emergency situations, limit activities in known/occupied sage grouse habitat to avoid adverse impacts ...related to rights of way. Do not authorize new rights of way within 2.0 miles of leks.	14) Human activity during breeding and nesting, or at watering sites.
Use mechanical treatment or prescribed fire to reduce juniper. * Guideline 11.	15) Additional predator perch sites.
Construct new livestock facilities (water developments, troughs, fences, corrals) at least 0.6 miles from leks, use “perch guards” on fence posts and rock cribs, and construct future livestock exclosures large enough to minimize raptor predation. *Guideline 4.	15) Additional predator perch sites.
Avoid placing new structures within 2.0 miles of leks (try to place near existing corridors), avoid visiting sites near leks at dawn or dusk during breeding season, on a case-by-case basis off site mitigation may be considered.	15) Additional predator perch sites.
OTHER PRIORITIES	
Where possible use native seed mixtures appropriate to the soil, climate and land form. Use management to increase sagebrush in seedings.	2) Long-term/permanent conversion of sagebrush to perennial herbaceous (R-4).
Avoid surface occupancy within 2 miles of known/occupied sage-grouse use areas, consider off site mitigation. Reclaim mining areas after disturbance with native seeding.	5) Loss of sagebrush acres.
Retain public lands that contain leks or other important habitat unless acquisition would result in obtaining equal or better habitat. Address in RMP.	5) Loss of sagebrush acres.
In areas that have the potential to produce mat grass meadows and that are currently unallotted to livestock or horses, prescriptive graze or burn, e.g. Bicondoa (Bighorn sheep), Highrock Canyon (Horses).	6) Conversion of forb meadows to mat grass meadows
Where appropriate, reintroduce fire onto landscape, * Guideline 11 for fire, e.g. Massacre Ranch R_x graze and burn.	6) Conversion of forb meadows to mat grass meadows.
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d).	12) Low density or lack of appropriate insects for early brood rearing forage.
Construct new spring developments to maintain their free-flowing nature and wet meadow characteristics, install wildlife escape ramps in new water troughs, retrofit existing troughs with wildlife escape ramps. *Guideline 13.	13) Lack of access to water.
Prohibit development of new campgrounds in riparian or wet meadow areas, apply (as necessary) seasonal or area closures in key sage-grouse areas.	13) Lack of access to water.

During breeding season, surface occupancy within 0.3 miles of active breeding sites/leks should be avoided. Avoid energy or mineral associated facilities within 2.0 miles of leks. Off site mitigation may be considered in evaluating minerals activities on a case-by-case basis. .	14) Human activity during breeding and nesting, or at watering sites.
Retain public lands that contain leks, nesting, brood- rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	14) Human activity during breeding and nesting, or at watering sites.
Prohibit development of new campgrounds in riparian or wet meadow areas, apply as necessary seasonal or area closures in key sage-grouse areas.	14) Human activity during breeding and nesting, or at watering sites.
Do not authorize new rights-of- ways within 2 miles of leks.	16) Artificially high predator population.
Retain public lands that contain leks, nesting, brood- rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity	16) Artificially high predator population.
Limit development of new roads into known/occupied sage-grouse habitat. Do not authorize new rights-of- ways within 2.0 miles of leks. Aggressive initial attack response to all fires.	17) Human-caused (non prescription) fire.
KNOWN POPULATION CONSERVATION MEASURE PRIORITIES	
Conduct radio telemetry study to monitor habitat use within the PMU.	9) Insufficient stubble for successful nesting cover 11) Lack of understory for sage grouse nesting cover and spring forage (R-2)

1. Risk Factors are described in the “Massacre PMU Habitat Risk Assessment Matrix”. The Risk Assessment narratives provide discussion and more specifics on each risk factor and how conservation measures would be applied.

Washoe - Modoc Sage Grouse Plan
Habitat Conservation Measures – Massacre PMU (Winnemucca portion)

The conservation measures below were identified in the Massacre PMU Habitat Risk Assessment (Winnemucca portion) prepared for the Washoe – Modoc Sage Grouse Conservation Strategy. This is a first attempt at prioritizing conservation measures for sage grouse. Please refer to the documents "Massacre PMU Habitat Risk Assessment" and the "Sage Grouse Habitat Management Risks, Conservation Measures, and Monitoring Actions-Massacre Population Management Unit" for more information on risk factors and conservation measures, as identified by the habitat technical committee. Several known population priorities are also provided in bold italics. **Note: these priorities are written slightly differently than those written by the habitat group responsible for the Surprise Field Office managed side.**

Conservation Measures	Associated Risk Factors[1]
FIRST PRIORITIES	
Emergency rehabilitation measures after fire, use of native seed mix when possible to enhance sage grouse habitat, keeping cows off for two growing seasons. Full suppression on R-0 sites (can shift to R-1 easily). Limit back burning and burning out islands of unburned fuel.	1) Temporary conversion of sagebrush to perennial herbaceous (R-1).
Emergency rehabilitation measures, site specific seeding or other treatment particularly on low elevation sites and/or south facing slopes. Increase priority for fire suppression on R-2 sites to prevent shift to an R-4. Limit back burning and burning out islands of unburned fuel.	3) Conversion of sagebrush to annual herbaceous (R-4)
Mechanical treatment or prescribed fire. Current planning efforts within the BLM, AMP revisions, current and projected rangeland projects.	4) Conversion of sagebrush to juniper (R-3)
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). No new roads in riparian areas, where a problem consider relocating. * Guideline 16 for utilization levels.	8) Conversion of meadows to upland vegetation
Temporary livestock exclusion (rest), change in livestock and horse use period or intensity of use, changes in salting or watering use areas. * Standard 5 for biodiversity, Guidelines 5, 8,9,11,16.	9) Insufficient stubble for successful nesting cover
SECOND PRIORITIES	
Aggressively treat noxious weed and other invasive plants where they threaten quality sage-grouse habitat.	3) Conversion of sagebrush to annual herbaceous (R-4)

Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately. * Standard 2 for Streams and 4 for Riparian and Wetland sites, Guideline 16 for utilization levels.	7) Conversion of meadows to bare ground
Use of prescribed fire, mechanical or chemical disturbance, change in grazing prescription. * Standard 1 for upland soils and standard 5 for bio-diversity, Guidelines 5, 8,9,11,16.	10) Low vigor herbaceous vegetation (poor nesting cover & spring forage, (R-2)).
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately. * Standard 4 for Riparian and Wetland sites, and Standard 5 for Biodiversity, Guidelines 4, 8, 9,16.	10) Low vigor herbaceous vegetation (poor nesting cover & spring forage, (R-2)).
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately. * Guidelines 4, 8, 9, and 16.	10) Low vigor herbaceous vegetation (poor nesting cover & spring forage, (R-2)).
Aggressively treat noxious weeds and other invasive plants where they threaten quality of sage grouse habitat. * Guideline 10 for control of noxious weeds which may include grazing or fire management.	10) Low vigor herbaceous vegetation (poor nesting cover & spring forage, (R-2)).
Change in grazing prescription. * Standard 5 for biodiversity, Guideline 11.	11) Lack of understory for sage grouse nesting cover and spring forage (R-2)
Except in emergency situations, limit activities in known/occupied sage grouse habitat to avoid adverse impacts ...related to rights of way. Do not authorize new rights of way within 1/4 mile of leks.	14) Human activity during breeding and nesting, or at watering sites
Use mechanical treatment or prescribed fire to reduce juniper. * Guideline 11.	15) Additional predator perch sites
Construct new livestock facilities (troughs, fences, corrals) at least 0.6 miles from leks, restrict new water developments, use “perch guards” on fence posts and rock cribs, and construct future livestock exclosures large enough to minimize raptor predation. *Guideline 4.	15) Additional predator perch sites
Avoid placing new structures within 2 miles of leks (try to place near existing corridors), avoid visiting sites near leks at dawn or dusk during breeding season, on a case-by-case basis off site mitigation may be considered.	15) Additional predator perch sites

OTHER PRIORITIES	
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately. Brush beating, mechanical or other disturbance or re-seeding also options.	11) Lack of understory for sage grouse nesting cover and spring forage (R-2)
Where possible use native seed mixtures appropriate to the soil, climate and land form.	2) Long-term/permanent conversion of sagebrush to perennial herbaceous (R-)4
Avoid surface occupancy within 2 miles of known/occupied sage-grouse use areas, consider off site mitigation. Reclaim mining areas after disturbance with native seeding.	5) Loss of sagebrush acres
Retain public lands that contain leks or other important habitat unless acquisition would result in obtaining equal or better habitat.	5) Loss of sagebrush acres
In areas that have the potential to produce mat grass meadows and that are currently unallotted to livestock or horses, prescriptive graze or burn, e.g. Bicondoa (Bighorn sheep), Highrock Canyon (Horses).	6) Conversion of forb meadows to mat grass meadows
Where appropriate, reintroduce fire onto landscape, * Guideline 11 for fire, e.g. Massacre Ranch R_x graze and burn.	6) Conversion of forb meadows to mat grass meadows
Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Where wild horse/burro grazing results in utilization determined to be detrimental to habitat quality, adjust Appropriate Management Levels appropriately.	12) Low density or lack of appropriate insects for early brood rearing forage
Construct new spring developments to maintain their free-flowing nature and wet meadow characteristics, install wildlife escape ramps in new water troughs, retrofit existing troughs with wildlife escape ramps. *Guideline 13.	13) Lack of access to water
Prohibit development of new campgrounds in riparian or wet meadow areas, apply (as necessary) seasonal or area closures in key sage-grouse areas.	13) Lack of access to water
Avoid surface occupancy within 0.6 miles of known breeding sites/leks. Avoid energy or mineral associated facilities within 0.25 miles of leks. Off site mitigation may be considered in evaluating minerals activities on a case-by-case basis.	14) Human activity during breeding and nesting
Retain public lands that contain leks, nesting, brood- rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	14) Human activity during breeding and nesting

Prohibit development of new campgrounds in riparian or wet meadow areas, apply as necessary seasonal or area closures in key sage-grouse areas.	14) Human activity during breeding and nesting
Do not authorize new rights-of- ways within 2 miles of leks.	16) Artificially high predator population
Retain public lands that contain leks, nesting, brood- rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	16) Artificially high predator population
Limit development of new roads into known/occupied sage-grouse habitat. Do not authorize new rights-of- ways within 2 miles of leks. Aggressive initial attack response to all fires.	17) Human-caused fire

Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Action Plan Worksheet for Conservation Measures

Priority Ranking (please circle): (First) Second Other

Conservation Measure: Emergency rehabilitation measures after fire where needed. Use of native seed mix, including sagebrush and forbs appropriate to site, when possible to enhance sage grouse habitat. Keeping cows off for two growing seasons and other grazing management as needed to ensure meeting both overstory and undertstory objectives. Full suppression on R-O sites (can shift to R-1 easily).

What is the objective of this project/management approach? What is the conservation measure targeting? How many acres of R-O sites currently targeted?

The objective of this approach is to return sites to useful sage grouse habitat conditions as quickly as possible following fire occurrence. The conservation measure is targeting noxious weed encroachment (hence the native seeding when necessary) and general site conditions (hence the rest from livestock grazing). This PMU has experienced a considerable amount of wildfire activity in R-0 sites, and fire suppression is being emphasized to prevent extremely large, one-time conversions of R-0 sites to R-1 sites. All of the approximately 481,000 acres of R-0 sites in the Surprise Field Office managed portion of the PMU are currently targeted for full wildfire suppression and active post-fire management. This measure does not preclude the use of prescribed fire, where fire would be effective in maintaining healthy sagebrush communities in the long term. However, prescribed fires would be small, specific to target communities, and actively managed post-fire.

How will this project/management approach be carried out? Who will be responsible for seeding? Who will ensure the resting of grazing?

Following wild fires, an interdisciplinary team of specialists from the BLM determines what measures are needed to rehabilitate burned areas. NEPA is completed, with consultation, and a decision is issued by the BLM. Funding for stabilization and rehabilitation is obtained through a nation-wide wildfire account, and emergency actions are generally completed within months of a fire. The BLM issues decisions to the affected livestock operations and ensures burned areas are rested from grazing.

Are some portions of the PMU with R-O sites more critical than others? Where? (locations)

As a general rule, the lower the elevation, the more critical it is to suppress wildfire in big sagebrush dominated R-0 sites. These sites are more susceptible to noxious and invasive weeds (particularly cheatgrass). In general, low sagebrush dominated R-0 communities are relatively safe from large scale wildfires, and they recover native communities rapidly.

When should this action strategy occur? Seasonal or based on habitat conditions/criteria?
Aggressive fire suppression should occur throughout the fire season (May through November). Most fires occur in the hottest part of the fire season (July 15 to September 15), and this is when fire suppression should also be the most aggressive. Stabilization actions generally occur immediately following fire suppression, seeding generally occurs the winter following the fire (best for seed germination), and rehabilitation actions (including changes in grazing management) occurs immediately or during the first grazing season following the fire.

How much will this cost? What is a rough estimate?
Fire suppression is extremely expensive. Relatively small incidents can quickly exceed $1 million dollars in suppression and stabilization costs. Seeding with local native seed is extremely expensive. Seed costs alone generally run over $100 per acre. When the costs of aerial or drill seeding is added, costs increase to over $300 per acre. Costs as a result of changes in grazing management vary widely. In allotments with good internal fencing and flexible operations, there may be little cost to the BLM and the livestock operation. In allotments that have poor infrastructure, little flexibility, or where large portions of the land base burned, the cost of changing management may be extremely expensive, either because the livestock operation is required to remove cattle from an allotment for several years, or because extensive fencing or herding is required to prevent cattle in the allotment from accessing the burned areas.

How will you know if this is successful?
Strategy success could be measured by comparing sites to Rangeland Health Standards (i.e., are standards being met). The presence of excessive amounts of noxious/invasive weeds or soil erosion would be indicators that the measure was not successful.

Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Action Plan Worksheet for Conservation Measures

Priority Ranking (please circle): (First) Second Other

Conservation Measure: Emergency .rehabilitation measures, site specific seeding or other treatment particularly on low elevation sites and/or south facing slopes. Increase priority for fire suppression and Emergency Site Rehabilitation (ESR) on R-2 sites to prevent shift to an R-4.

What is the objective of this project/management approach? What is the conservation measure targeting? How many acres are estimated in the PMU for ESR?

The objective of this approach is to return sites to useful sage grouse habitat conditions as quickly as possible following fire occurrence. The conservation measure is targeting noxious and invasive weed encroachment (hence the native seeding) and general site conditions (hence the rest from livestock grazing). More than half of the approximately 246,000 acres of R-2 sites in the Surprise Field Office managed portion of the PMU, including all of the Wyoming big sagebrush communities, are currently targeted for full wildfire suppression and aggressive post-fire management. This measure does not preclude the use of prescribed fire, where fire would be effective in maintaining healthy sagebrush communities in the long term. However, prescribed fires would be very small, very specific to target communities, and only used when no other management options exist.

How will this project/management approach be carried out? Who will have to do what?

Following wild fires, an interdisciplinary team of specialists from the BLM determines what measures are needed to rehabilitate burned areas. NEPA is completed, with consultation, and a decision is issued by the BLM. Funding for stabilization and rehabilitation is obtained through a nation-wide wildfire account, and emergency actions are generally completed within months of a fire. The BLM issues decisions to the affected livestock operations and ensures burned areas are rested from grazing.

Where are these sites located on the PMU?

These sites are located throughout the PMU, at the lower elevations and on south facing slopes.

When will this action take place? Is this seasonal or based on habitat conditions/criteria?

This action is ongoing. Aggressive fire suppression occurs throughout the fire season (May through November). Most fires occur in the hottest part of the fire season (July 15 to September 15), and this is when fire suppression is also be the most aggressive. Stabilization actions generally occur immediately following fire suppression, seeding generally occurs the winter following the fire (best for seed germination), and

rehabilitation actions (including changes in grazing management) occurs immediately or during the first grazing season following the fire.

How much will this cost? What is a rough estimate?
Fire suppression is extremely expensive. Relatively small incidents can quickly exceed $1 million dollars in suppression and stabilization costs. Seeding with local native seed is extremely expensive. Seed costs alone generally run over $100 per acre. When the costs of aerial or drill seeding is added, costs increase to over $300 per acre. Costs as a result of changes in grazing management vary widely. In allotments with good internal fencing and flexible operations, there may be little cost to the BLM and the livestock operation. In allotments that have poor infrastructure, little flexibility, or where large portions of the land base burned, the cost of changing management may be extremely expensive, either because the livestock operation is required to remove cattle from an allotment for several years, or because extensive fencing or herding is required to prevent cattle in the allotment from accessing the burned areas.

How will you know if ESR is successful?
Strategy success could be measured by comparing sites to Rangeland Health Standards (i.e., are standards being met). The presence of excessive amounts of noxious/invasive weeds or soil erosion would be indicators that the measure was not successful.

Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Action Plan Worksheet for Conservation Measures

Priority Ranking (please circle): (First) Second Other

Conservation Measure: Mechanical treatment or prescribed fire. Current planning efforts within the BLM, AMP revisions, current and projected rangeland projects.

What is the objective of this project/management approach? What is the conservation measure targeting? How many acres are targeted in the PMU for mechanical treatment or prescribed fire? What are the current planning efforts?
The Objective is to maintain sagebrush communities as sagebrush dominated sites. The conservation measure targets juniper invading sagebrush communities. Approximately 24,000 acres of sagebrush habitat in the Massacre PMU are currently being invaded by juniper. Currently there are a few, small scale projects underway or in the process of being evaluated to remove juniper from sagebrush communities. More significantly for the portion of the PMU that is managed by the Surprise Field Office, a large scale juniper management plan is under construction, concurrent to the new Resource Management Plan (RMP), which will set general goals and objectives for juniper control in sagebrush habitat. Expected to be completed in 2005.

How will this project/management approach be carried out? Who will have to do what?
The juniper management plan and RMP will determine actual acres and general areas for juniper treatement. Site specific projects will then be developed at the field office level (Surprise or Winnemucca). Consultation, NEPA, and mitigation would be completed by the BLM. Funding for labor and equipment may be shared with private landowners, other agencies, special interest groups, etc.

Where are these sites located on the PMU?
The acres of sagebrush communities which are currently being invaded by juniper are mapped as R3 zones. These acres are well distributed through the PMU.

When will this action take place? Is this seasonal or based on habitat conditions/criteria?
Juniper management projects are ongoing, as funding and staff time allow. Generally projects will take place from late spring to fall depending on access and probable Limited Operating Periods (LOP's). With current levels of funding and treatment techniques, it is expected that long term treatment of juniper would be very slow and that only a fraction of the 24,000 acres would be treated at a rate that keeps up with juniper encroachment. Selection of specific treatment areas and prioritizing of treatment are based on habitat conditions.

How much will this cost? What is a rough estimate?

Expensive to treat mechanically, up to $600.00/acre. Burning less expensive but not always the best solution e.g., don't want to burn in cheatgrass areas, about $150.00/acre.

How will you know mechanical treatment or prescribed fire is successful?
Fire program carries out photo point and some plant ID monitoring after all fuel treatments. The main indicator of success would be a lack of juniper trees in sagebrush communities.

Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Action Plan Worksheet for Conservation Measures

Priority Ranking (please circle): (First) Second Other

Conservation Measure: Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). No new roads in riparian areas, where a problem consider relocating. *Guideline 16 for utilization levels.

What is the objective of this project/management approach? What is the conservation measure targeting? How many acres are currently estimated in the PMU to be determined detrimental to habitat quality due to grazing? What determines "detrimental to habitat quality? Are any roads currently under review for relocating? ?

Objective of conservation measure is to protect brood rearing areas (riparian areas). The Conservation Measure is targeting concentrated use/impacts in riparian areas that result in upland vegetation encroaching into riparian areas or the diversity/availability of herbaceous vegetation being reduced. The areas this type of use generally affects is relatively small and is not normally mapped separately from adjacent uplands. Therefore, it is unknown exactly how many acres are involved. Areas detrimentally affected by grazing and vehicle compaction can easily be "picked out" by signs such as; down cutting of on riparian areas, invasion of upland species onto wet meadow habitats, and areas of severe wallowing leading to bare ground. In addition these could be picked out via Rangeland Health Assessments (RHA's) or Riparian Functional Assessments (RFA's). No roads are currently under review for relocation.

How will this project/management approach be carried out? Who will have to do what?

Impacted areas will be identified by all field staff. If necessary, change in the grazing operation will take place via the range management specialist changing the Allotment Management Plan (AMP). If the BLM finds that an area is not meeting Standards set forth within the Rangeland Health Standards as a result of livestock grazing impacts, the problem must be taken care of as soon as practical. Where appropriate, small impacted riparian areas may be fenced. Actions to affect road closures and relocations are less clear cut. Political pressure from interested publics can prevent need road closures, and enforcement of road closures in remote areas can be difficult to impossible.

Where currently are detrimental sites located?

Sites currently being negatively impacted by livestock grazing occur around perennial water sources in areas that receive annual hot-season, long-duration grazing use. Most allotments have some riparian sites that receive inappropriate levels livestock grazing or which have roads along riparian corridors. However, most areas within the Massacre PMU are managed to minimize this type of grazing use. There are several allotments that have insufficient infrastructure to control hot season livestock use, including Denio,

Nut Mountain, and Massacre Mountain. Other areas support season-long wild horse herds.

When will this action take place? Is this seasonal or based on habitat conditions/criteria?
Timing of action based on site characteristics and livestock operation. Action could be for example institution of a rest or rest/rotation cycle on a specified allotment, or a reduction of cattle in a specified area (moving around cattle among more pastures or in a different sequence).

How much will this cost? What is a rough estimate?
Unknown but may be more expensive for the livestock operator (costs to move/drive cattle between pastures) than the Bureau (BLM), really depends on each situation. BLM would incur varying costs depending on the type of actions (EA's, NEPA, revised AMP's) that would be needed in each situation.

How will you know this action/strategy is successful?
Strategy success could be measured by comparing sites to Rangeland Health Standards i.e., are standards being met. Long term photo-points, "green-line" transects and stream cross-sections would also be useful in tracking changes.

Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Action Plan Worksheet for Conservation Measures

Priority Ranking (please circle): **First** **Second** **Other**

Conservation Measure: Temporary livestock exclusion (rest), change in livestock and horse use period or intensity of use, changes in salting or watering use areas.
*Standard 5 for biodiversity, Guidelines 5,8, 9,11,16.

What is the objective of this project/management approach? What is the conservation measure targeting? How many acres are estimated in the PMU for livestock exclusion, rest?
Objective is to keep horses and livestock from taking so much forage as to preclude good nesting habitat. Cannot determine acreage of exclusion from year to year, since animals are constantly moving (horses) or being moved (cattle).

How will this project/management approach be carried out? Who will have to do what?
Horses will be removed by the BLM according to set AML's for each horse management unit. Livestock would be moved in accordance with Rangleland Health Standards.

Where are these sites located on the PMU?
Varies year to year for livestock. Horses are gathered as determined necessary to stay within AML's. AML's are re-evaluated periodically, as funding and staff time allow.

When will this action take place? Is this seasonal or based on habitat conditions/criteria?
Timing of action based on site characteristics and livestock operation. Action could be for example institution of a rest or rest/rotation cycle on a specified allotment, or a reduction of cattle in a specified area (moving around cattle among more pastures or in a different sequence

How much will this cost? What is a rough estimate?
Horse gathers require helicopters (650.00/hour plus ferrying charges) and lots of manpower to set up traps, corrals, etc. A rough estimate based on a 200 head gather is $65,000.00.
Costs to move cattle are more difficult to estimate but may be more expensive for the livestock operator (costs to move/drive cattle between pastures) than the Bureau (BLM), really depends on each situation. BLM would incur varying costs depending on the type of actions (EA's, NEPA, revised AMP's) that would be needed in each situation.

How will you know if the action or conservation strategy is successful?

Strategy success could be measured by comparing sites to Rangeland Health Standards i.e., are standards being met. Long term photo-points would also be useful in tracking changes.

Washoe Modoc Sage Grouse Conservation Plan
Massacre PMU
Action Plan Worksheet for Conservation Measures

Priority Ranking (please circle): **First** **Second** **Other**

Conservation Measure: Annually monitor bird numbers on leks.

What is the objective of this project/management approach? What is the conservation measure targeting? How many leks are currently monitored on the PMU?
To track population trends and find "new" leks. Recent surveys have detected between one and two "new" leks every year, and several more sites are thought to exist. Currently there are approximately 43 known and historic leks within the PMU.

How will this project/management approach be carried out? Who will have to do what?
Both aerial (on a limited basis due to costs) and ground surveys will be carried out. Surveys will be conducted by both NDOW and the BLM. Surveys can be limited by weather, access, and timing constraints but realistically also by funding.

Where are the current leks located on the PMU? Will new leks be targeted for monitoring?
Leks are mapped throughout the PMU with concentrations in the eastern portions of the PMU. New leks will be surveyed along with historic ones, depending on funding level and access.

When will this action take place? Is this seasonal or based on habitat conditions/criteria?
Surveys generally take place from late March to early May. While leks should be visited several times every year, generally staffing (funding) and weather conditions (snow and mud) preclude this.

How much will this cost? What is a rough estimate?
Aerial surveys have generally run about $5,000.00 per year and covered only about 2/3 of leks only once. To fully cover all leks aerially would run upwards of $20,000.00 per year while not providing the accuracy that ground surveys have. Ground surveys are limited locally by weather conditions and would end up costing much more to survey the same number of lek sites.

How will you know this action/strategy is successful?
Should probably be answered by game biologist, Mike Dobel.

MASSACRE POPULATION MANAGEMENT UNIT
PRIVATE LANDS RISK ASSESSMENT

Risk #7: Conversion of meadows to bare ground

Season/Habitat affected: Brood-rearing

Contributing Management Action: Over utilization of meadows
Risk Rating: Medium

Of the 1,500 acres (500 private, 1000 public) of riparian vegetation dominated communities in the Surprise Resource Area portion of the Massacre PMU, about 663 acres (about 45% of the riparian communities) receive periodic heavy use that exposes some bare soil in the riparian system. Management is in place to mitigate this level of use on about 600 of these acres, including establishing wild horse appropriate management levels, interim decisions with riparian stubble height requirements, additional enclosures, deferred use, periodic rest, and early turnoff for regrowth. Most AMPs call for maintaining greater than 90% ground cover on meadows, horse plans recognize the significance of season-long wild horse use on meadows, and Rangeland Health Assessments are picking up the areas (and addressing the causes) where use to bare ground on meadows is still occurring. About 63 acres of riparian communities, primarily in portions of allotments used by livestock and wild horses and on allotments used season-long, continue to receive annually high levels of use with no mitigation. Therefore, the risk of converting meadows to bare ground is moderate.

Risk #16: Artificially high predator population

Season/Habitat affected: All

Contributing Management Action: High speed roads, which increase the amount of road-killed animals and attract ravens.
Risk Rating: Low

Conservation Measure(s): *Do not authorize new rights-of- ways within 3.2 km (2 miles) of leks.*
Responsible Parties: BLM, NDOT
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Contributing Management Action: Urban expansion and ranchettes, which increase the amount of garbage and attract ravens.
Risk Rating: Low

Conservation Measure(s): *Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.*
Responsible Parties: BLM
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Contributing Management Action: Agricultural expansion, which increases the amount of food for ravens
Risk Rating: Low

Conservation Measure(s): *Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.*
Responsible Parties: BLM
Monitoring: *Monitor leks a minimum of 2 years in 5.*

Private lands are mostly uninhabited with little chance of additional urban or agricultural expansion. With the exception of Nevada highways 34 and 8A (45 mph, gravel), roads in the Massacre PMU are mostly low speed. Therefore, there is a low risk of producing an artificially high predator population as a result of road kill, urban expansion, and agricultural expansion.

Massacre PMU Habitat Risk Assessment Matrix Draft!!! (All final comments from 6 August 2002 meeting not yet incorporated)

RISK FACTOR: Habitat Degradation	Contributing Management Actions	Risk (Y/N)	H/M/L	Conservation Measures	Responsible parties	Monitoring (BLM)	Timeline (BLM)
1) Temporary conversion of sagebrush to perennial herbaceous (R-1)	Wildland and prescribed fires/herbicide on areas with strong native understory	Y	H	Emergency rehabilitation measures after fire, use of native seed mix when possible to enhance sage grouse habitat, keeping cows off for two growing seasons. Full suppression on R-0 sites (can shift to R-1 easily).	BLM	-Photo-points -Site inspection to ensure seed mix appropriate and effective	-Every 3-5 years -Annually
2) Long-term/permanent conversion of sagebrush to perennial herbaceous (R-4)	Non-native species seedings	Y	L	Where possible use native seed mixtures appropriate to the soil, climate and land form.	BLM	-Photo-points -Site inspection to ensure seed mix appropriate and effective	-Every 3-5 years -Annually
3) Conversion of sagebrush to annual herbaceous (R-4)	Fire on areas with weak understory, usu. low elevations	Y	H	Emergency rehabilitation measures, site specific seeding or other treatment particularly on low elevation sites and/or south facing slopes. Increase priority for fire suppression on R-2 sites to prevent shift to an R-4.	BLM	-Photo-points -Site inspection to ensure seed mix appropriate and effective	-Every 3-5 years -Annually
	Noxious weed invasion	Y	M	Aggressively treat noxious weed and other invasive plants where they threaten quality sage-grouse habitat	BLM, local counties	GPS and track polygon size	Monitor treatments annually until controlled/eliminated
4) Conversion of sagebrush to juniper (R-3)	Lack of fire/disturbance	Y	H	Mechanical treatment or prescribed fire. Current planning efforts within the BLM, AMP revisions, current and projected rangeland projects	BLM	Photo-points	Re-shoot photo points up to twice a year. 5 year maximum?

RISK FACTOR: Habitat Degradation	Contributing Management Actions	Risk (Y/N)	H/M/L	Conservation Measures	Responsible parties	Monitoring (BLM)	Timeline (BLM)
5) Loss of sagebrush acres	Mining	Y	L	Avoid surface occupancy within 2 miles of known/occupied sage-grouse use areas, consider off site mitigation. Reclaim mining areas after disturbance with native seeding.	BLM	-Photo-points -Site inspection to ensure seed mix appropriate and effective	-Every 3-5 years -Annually
5) continued	Urban and agricultural expansion	Y	L	Retain public lands that contain leks or other important habitat unless acquisition would result in obtaining equal or better habitat.	Local and state governments	???	???
6) Conversion of forb meadows to mat grass meadows	Underutilization	Y	L	In areas that have the potential to produce mat grass meadows and that are currently unallotted to livestock or horses, prescriptive graze or burn, e.g. Bicondoa (Bighorn sheep), Highrock Canyon (Horses).	BLM	Photo-points	Every 5 years for grazing. Annually every 3-5 years after a prescriptive burn
	Lack of fire	Y	L	Where appropriate, reintroduce fire onto landscape, * Guideline 11 for fire, e.g. Massacre Ranch R_x graze and burn.	BLM	Photo-points, GPS fire size	Re-shoot photo points up to twice a year
7) Conversion of meadows to bare ground	Overutilization, usually associated with water sources	Y	M	Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). * Standard 2 for Streams and 4 for Riparian and Wetland sites, Guideline 16 for utilization levels.	BLM	Photo-points, greenlines, stubble height and soil alteration limitations	3-5 years for photo-points and greenlines ,up to several times a season for stubble height and soil

RISK FACTOR: Habitat Degradation	Contributing Management Actions	Risk (Y/N)	H/M/L	Conservation Measures	Responsible parties	Monitoring (BLM)	Timeline (BLM)
							alteration.
8) Conversion of meadows to upland vegetation	Reduced functionality associated with headcutting, soil alteration (roads, heavy grazing), or confinement of floodplain (roads)	Y	H	Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). No new roads in riparian areas, where a problem consider relocating. * Guideline 16 for utilization levels.	BLM, permittees	Photo-points, greenlines, stubble height limitations, Rangeland Health Assessments (RHA's)	3-5 years for photo-points and greenlines, up to several times a season for stubble height, RHA's 1 in 15 years.
9) Insufficient stubble for successful nesting cover	Short term overutilization	Y	M/H	Temporary livestock exclusion (rest), change in livestock and horse use period or intensity of use, changes in salting or watering use areas. * Standard 5 for biodiversity, Guidelines 5, 8,9,11,16.	BLM, permittees	Utilization or stubble height limitations	Up to several times a season
10) Low vigor herbaceous vegetation (poor nesting cover & spring forage, (R-2)).	Lack of fire/disturbance in Mountain big sagebrush sites	Y	M	Use of prescribed fire, mechanical or chemical disturbance, change in grazing prescription. * Standard 1 for upland soils and standard 5 for bio-diversity, Guidelines 5, 8,9,11,16.	BLM, permittees	Photo-points and long- term trend	Every 3-5 years for photo-points and 1 in 10 years for trend
	Long term overutilization	Y	M	Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). * Standard 4 for Riparian and Wetland sites, and Standard 5 for Biodiversity, Guidelines 4, 8, 9,16.	BLM, permittees	Utilization compliance and long term trend	1 in 3 years for utilization and 1 in 10 years for trend

RISK FACTOR: Habitat Degradation	Contributing Management Actions	Risk (Y/N)	H/M/L	Conservation Measures	Responsible parties	Monitoring (BLM)	Timeline (BLM)
	Annual, long duration spring season use (March April, May)	Y	M	Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d).* Guidelines 4, 8, 9, and 16.	BLM, permittees	Utilization compliance and long term trend	1 in 3 years for utilization and 1 in 10 years for trend
	Noxious weed/cheatgrass encroachment	Y	M	Aggressively treat noxious weeds and other invasive plants where they threaten quality of sage grouse habitat. * Guideline 10 for control of noxious weeds which may include grazing or fire management.	BLM, local counties	GPS and track polygon size	Monitor treatments annually until controlled
11) Lack of understory for sage grouse nesting cover and spring forage (R-2)	Lack of fire/disturbance in Wyoming and Lahontan sagebrush sites	Y	L/M	Change in grazing prescription. * Standard 5 for biodiversity, Guideline 11.	BLM	Photo-points and long- term trend	Every 3-5 years for photo-points and 1 in 10 years for trend
	Historic overutilization			Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d). Brush beating, mechanical or other disturbance or re-seeding also options.	BLM, permittees	Utilization compliance and long term trend	1 in 3 years for utilization and 1 in 10 years for trend
12) Low density or lack of appropriate insects for early brood rearing forage	Lack of diverse habitats for favorable insects, e.g. forb areas.	Y	L	Where livestock grazing results in utilization determined to be detrimental to habitat quality, changes in grazing management will be made pursuant to 43 CFR 4180.1(d).	BLM, permittees	Utilization compliance and long term trend	1 in 3 years for utilization and 1 in 10 years for trend

RISK FACTOR: Habitat Degradation	Contributing Management Actions	Risk (Y/N)	H/M/L	Conservation Measures	Responsible parties	Monitoring (BLM)	Timeline (BLM)
13) Lack of access to water	Spring developments that capture all water and are inaccessible to sage-grouse	Y	L	Construct new spring developments to maintain their free-flowing nature and wet meadow characteristics, install wildlife escape ramps in new water troughs, retrofit existing troughs with wildlife escape ramps. *Guideline 13.	BLM	Project inspections	1 in 5 years
	Recreational camping at water	Y	L	Prohibit development of new campgrounds in riparian or wet meadow areas, apply (as necessary) seasonal or area closures in key sage-grouse areas.	BLM, NDOW, local counties	Law enforcement patrols	Opportunisti cally

RISK FACTOR: Disturbance	Contributing Management Actions	Risk (Y/N)	H/M/L	Conservation Measures	Responsible parties	Monitoring (BLM)	Timeline (BLM)		Monit
14) Human activity during breeding and nesting, or at watering sites	Mining	Y	L	Avoid surface occupancy within 0.6 miles of known breeding sites/leks. Avoid energy or mineral associated facilities within 0.25 miles of leks. Off site mitigation may be considered in evaluating minerals activities on a case-by-case basis.	BLM	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Roads	Y	M	Except in emergency situations, limit activities in known/occupied sage grouse habitat to avoid adverse impacts ...related to rights of way. Do not authorize new rights of way within 1/4 mile of leks.	BLM, State	Lek surveys	Monitor lek site at minimum 2 in 5 years		

	Urban expansion	Y	L	Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	BLM Local and State governments	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Recreation	Y	L	Prohibit development of new campgrounds in riparian or wet meadow areas, apply as necessary seasonal or area closures in key sage-grouse areas.	BLM, local county	Lek surveys, law enforcement patrols	Monitor lek site at minimum 2 in 5 years, law enforcement patrols opportunistically		
15) Additional predator perch sites	Juniper encroachment, lack of fire	Y	M	Use mechanical treatment or prescribed fire to reduce juniper. * Guideline 11.	BLM, private land owners	Photo-points	Re-shoot photo points up to twice a year. 5 year maximum?		
	Pasture/Allotment fences, spring exclosures, wells, troughs	Y	M	Construct new livestock facilities (troughs, fences, corrals) at least 0.6 miles from leks, restrict new water developments, use “perch guards” on fence posts and rock cribs, and construct future livestock exclosures large enough to minimize raptor predation. *Guideline 4.	BLM	Lek surveys, project inspections	Monitor lek site at minimum 2 in 5 years, inspect projects 1 in 5 years		
	Transmission lines, communication sites	Y	M	Avoid placing new structures within 2 miles of leks (try to place near existing corridors), avoid visiting sites near leks at dawn or dusk during breeding season, on a case-by-case basis off site mitigation may be considered.	BLM, California and Nevada Public Utilities Commissions (CPUC and NPUC)	Lek surveys	Monitor lek site at minimum 2 in 5 years		

16) Artificially high predator population	High speed roads/road kill e.g. attracting ravens	Y	L	Do not authorize new rights-of- ways within 2 miles of leks.	BLM, NDOT?	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Urban expansion, e.g. “ranchettes”	Y	L	Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	BLM	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Agricultural expansion	Y	L	Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	BLM	Lek surveys	Monitor lek site at minimum 2 in 5 years		
17) Human-caused fire	Dispersed recreation and roads	Y	L	Limit development of new roads into known/occupied sage-grouse habitat. Do not authorize new rights-of-ways within 2 miles of leks. Aggressive initial attack response to all fires.	BLM, NDOT	Use lookouts, ground spotters, lightning maps, lek surveys	Annually during fire season, monitor lek site at minimum 2 in 5 years		
Explanations/comments				* Rangeland Health Standards and Guidelines for California and Northwestern Nevada, ** Directly out of WAFWA guidelines.					
				CFR 43 4180.1 Fundamentals of Rangeland Health BLM Manual 6840 Cowhead/Massacre MFP Tuledad/Homecamp MFP Various HMP’s, AMP’s					
RISK FACTOR: **Disturbance**	**Contributing Management Actions**	**Risk (Y/N)**	**H/M/L**	**Conservation Measures**	**Responsible parties**	**Monitoring (BLM)**	**Timeline (BLM)**		**Monitoring**

14) Human activity during breeding and nesting, or at watering sites	Mining	Y	L	Avoid surface occupancy within 0.6 miles of known breeding sites/leks. Avoid energy or mineral associated facilities within 0.25 miles of leks. Off site mitigation may be considered in evaluating minerals activities on a case-by-case basis.	BLM	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Roads	Y	M	Except in emergency situations, limit activities in known/occupied sage grouse habitat to avoid adverse impacts ...related to rights of way. Do not authorize new rights of way within 1/4 mile of leks.	BLM, State	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Urban expansion	Y	L	Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	BLM Local and State governments	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Recreation	Y	L	Prohibit development of new campgrounds in riparian or wet meadow areas, apply as necessary seasonal or area closures in key sage-grouse areas.	BLM, local county	Lek surveys, law enforcement patrols	Monitor lek site at minimum 2 in 5 years, law enforcement patrols opportunistically		
15) Additional predator perch sites	Juniper encroachment, lack of fire	Y	M	Use mechanical treatment or prescribed fire to reduce juniper. * Guideline 11.	BLM, private land owners	Photo-points	Re-shoot photo points up to twice a year. 5 year maximum?		

	Pasture/Allotment fences, spring exclosures, wells, troughs	Y	M	Construct new livestock facilities (troughs, fences, corrals) at least 0.6 miles from leks, restrict new water developments, use “perch guards” on fence posts and rock cribs, and construct future livestock exclosures large enough to minimize raptor predation. *Guideline 4.	BLM	Lek surveys, project inspections	Monitor lek site at minimum 2 in 5 years, inspect projects 1 in 5 years		
	Transmission lines, communication sites	Y	M	Avoid placing new structures within 2 miles of leks (try to place near existing corridors), avoid visiting sites near leks at dawn or dusk during breeding season, on a case-by-case basis off site mitigation may be considered.	BLM, California and Nevada Public Utilities Commissions (CPUC and NPUC)	Lek surveys	Monitor lek site at minimum 2 in 5 years		
16) Artificially high predator population	High speed roads/road kill e.g. attracting ravens	Y	L	Do not authorize new rights-of- ways within 2 miles of leks.	BLM, NDOT?	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Urban expansion, e.g. “ranchettes”	Y	L	Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	BLM	Lek surveys	Monitor lek site at minimum 2 in 5 years		
	Agricultural expansion	Y	L	Retain public lands that contain leks, nesting, brood-rearing or other important habitats for sage-grouse unless disposal would result in acquisition of equal or better habitat or lead to better habitat connectivity.	BLM	Lek surveys	Monitor lek site at minimum 2 in 5 years		
17) Human-caused fire	Dispersed recreation and roads	Y	L	Limit development of new roads into known/occupied sage-grouse habitat. Do not authorize new rights-of-ways within 2 miles of leks. Aggressive initial attack response to all fires.	BLM, NDOT	Use lookouts, ground spotters, lightning maps, lek surveys	Annually during fire season, monitor lek site at minimum 2 in 5 years		

Explanations/comments				* Rangeland Health Standards and Guidelines for California and Northwestern Nevada, ** Directly out of WAFWA guidelines.					
				CFR 43 4180.1 Fundamentals of Rangeland Health BLM Manual 6840 Cowhead/Massacre MFP Tuledad/Homecamp MFP Various HMP's, AMP's					