

# **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.

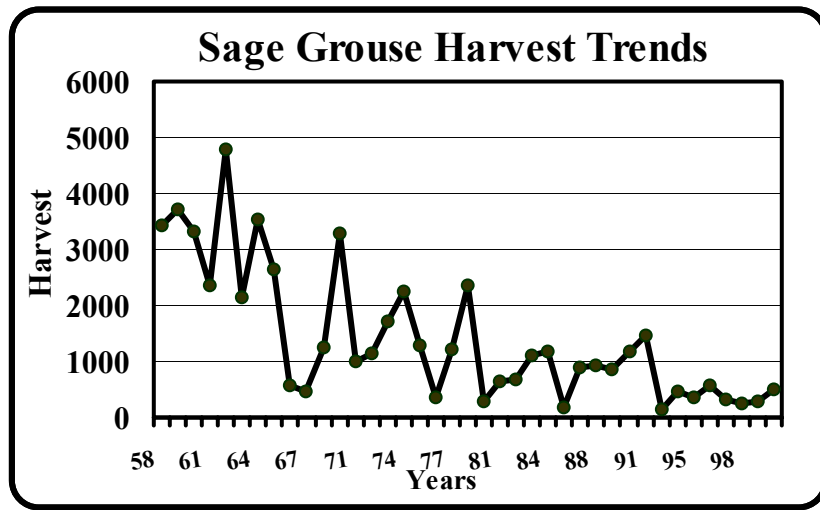
### **FACTOR: Harvest**

#### **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.**

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.

**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.**

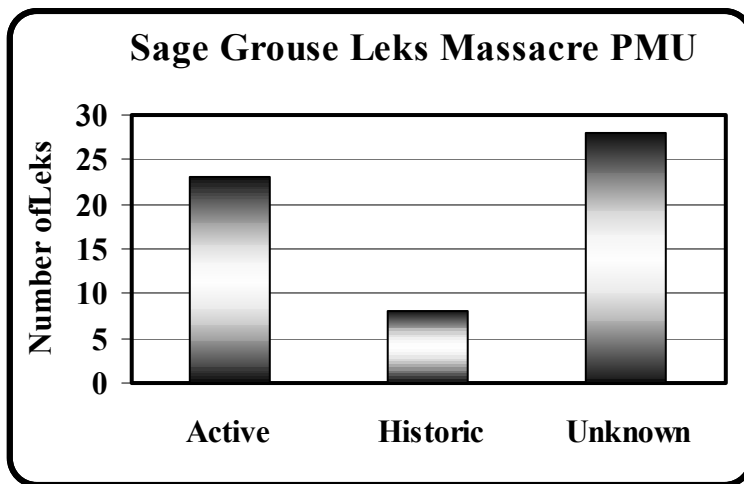
NDOW game wardens indicate that some illegal take of sage grouse occurs within the Massacre PMU. Most of this activity occurs during the late summer months when birds are closely associated with water sources and most vulnerable. Most of this take is considered to be opportunistic and no data exists 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.**

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**Risk: Excessive losses on adults by avian predators.**

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**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.**

**Determine reliable population estimates and trends.**

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

**Complete research on Sheldon Wildlife Refuge to determine bird health**

## **Objectives:**

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

**Collect necessary harvest data for population estimates by 2006.**

**Provide recreational opportunities for sport harvest.**

**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**

- 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.
- NDOW law enforcement officers will conduct patrols in the Massacre PMU to determine the extent of illegal harvest.  
Aerial lek surveys to determine spring breeding population estimate.
- Wing Composition Data to determine production, harvest composition and fall population estimate.
- 10% Harvest Questionnaire Survey to determine harvest levels.
- The Nevada Division of Wildlife will develop spring breeding and fall population estimates for sage grouse in the Massacre PMU.
- Research will be conducted to determine if avian predator control will improve production and recruitment rates of sage grouse in the Massacre PMU. Results from this research can be used to guide management decisions in other PMU's.
- Wildlife Services will conduct raven control and report on the number of birds removed
- Wildlife Services will conduct predator census and report on predator numbers.
- Division of Wildlife will collect wing composition data to determine production rates  
Research on nutrition is being conducted on the Sheldon National Wildlife Refuge.

## **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 on nutritional studies being done on the Sheldon may be applied to management of sage grouse in the Massacre PMU.