

# Sheldon Population Management Unit Population Conservation Plan

## INTRODUCTION

Sheldon National Wildlife Refuge, administered by the United States Fish and Wildlife Service (USFWS), encompasses over 575,00 acres in northern Washoe County. Elevations range from 4200 feet on the northeastern boundary to 7300 feet on Catnip Mountain. Yearly precipitation averages between 6 and 13 inches, depending on location. Approximately 90% of the refuge is sage grouse habitat, excluding the desert shrub cover types in the northeast corner of the refuge. The PMU boundary was drawn to exclude the desert shrub habitat. Collectively, sage brush cover dominate the PMU, with low sagebrush, Wyoming big sagebrush, and mountain big sagebrush occurring in similar amounts. Other vegetation types include riparian areas, aspen, mountain mahogany, and western juniper.

## CONSERVATION ASSESSMENT

The sagebrush habitat on the refuge is relatively intact, with little habitat fragmentation and range conditions are relatively good. Cheat grass occurs, but in low amounts. Much of the PMU is above the elevation at which cheat grass is highly competitive, and current fire monitoring shows little cheat grass on recently burned areas.

Sage grouse are a premier species on the refuge, along with pronghorn antelope, mule deer, and bighorn sheep. Several studies of sage grouse have been conducted on the refuge, starting in the 1980s with studies directed by Dr. Don Klebenow, of the University of Nevada – Reno (UNR). In 1998, studies were started under the direction of Dr. John Crawford, of Oregon State University (OSU), and these continue.

Consistent sage grouse monitoring was not developed until the mid 1990s when the Nevada Division of Wildlife (NDOW) began helicopter lek counts. Average number of males per lek has increased since 1996, but several leks counted from the ground in the early 1990s are no longer active. Productivity, measured as chicks per hen, shows high annual variation, but has decreased slightly since 1995. In 2001, fall population was estimated to be 3652.

### **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.

### **RISK: Unable to determine trend of population. Rated low**

NDOW and USFWS currently use lek counts and wing composition data to track

population trend. Lek counts are conducted by NDOW using a helicopter. Every active lek on the refuge is flown twice, on consecutive days. Average number of males per lek is tracked over time to determine population trend. Helicopter lek counts were initiated in 1994.

Sage grouse productivity is tracked using hunter-collected wings. Wings are analyzed by USFWS and NDOW biologists to determine sex and age of each bird. A ratio of young birds to hens (chicks per hen) and the percentage of young (% young) birds in the sample is used to track production. Wing collection was initiated in 1995.

Brood counts can also be used to estimate production. Typically, roads are driven and all sage grouse seen are classified at to age and sex. There are several problems with the method. Sage grouse occur in low densities and in many cases adequate samples sizes cannot be obtained. Brood counts have not produced reliable information on the refuge.

The number of males counted on leks and chicks per hen are used to obtain population estimates.

The current program on the Sheldon provides adequate information for tracking population trend; therefore this risk was rated low. However, if this level of monitoring should decrease, risk of not being able to assess population trend would increase.

**Risk: Unable to determine effects of conservation measures of plan. Rated medium**

Lek counts and wing composition data, as described above, will also be used to track this risk. A medium rating was assigned, however, because these data may not be adequate to assess the results of a site-specific project. Additional data could be collected, as determined by specific need at the time a conservation action was implemented.

**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 years breeding population.

The current sage grouse hunt on Sheldon is the most conservative in Nevada. A permit is required to hunt the 2 or 3-day season. Bag limits are 3 birds per day, 6 in possession. NDOW and USFWS coordinate on setting timing of the hunt and number of permits issued. All permit holders are required to deposit one wing from each sage grouse harvested in collection barrels on the refuge. In addition, hunters must return a questionnaire to USFWS stating if they actually hunted, where they hunted and how many birds they harvested. Compliance rate with returning the questionnaire was 90% in 2001.

**Risk: Over harvest of marginal and isolated populations. Does not apply**

**Risk: Over harvest of genetically unique populations. Does not apply**

These risks do not apply because the Sheldon PMU is not marginal, isolated, or genetically unique. Contiguous sage grouse habitat occurs in neighboring Vya and Massacre PMU's and in Oregon to the north of the refuge. Radio-telemetry and banding data demonstrate movement of birds between Sheldon and Beaty's Butte allotment in Oregon, and Massacre PMU. Recent genetic work conducted across the range of sage grouse show the populations in northern Nevada and southern Oregon are not genetically distinct.

**Risk: Crippling loss. Does not apply**

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

**Risk: Over harvest of population. Rated low**

Over harvest is always a risk when populations are hunted. In 2001, Sheldon fall population estimate was 3652 birds. Total harvest was 180 grouse; 5% of the fall population. This is well within WAFWA guidelines. Monitoring, through lek surveys and wing composition, should continue to ensure that over harvest is not occurring. Risk of over harvest would increase if the current level of monitoring was not maintained and the population was still hunted.

**Risk: Over harvest of females and young of the year. Rated low**

Over harvest of adult females and young is always a risk when populations are hunted, but on Sheldon PMU this risk is currently rated low. Mandatory return of wings allows biologists to monitor harvest rates on the population. Adult males are less vulnerable to harvest and are often under represented in wing samples. On Sheldon, percent chicks in the harvest ranged from 48 to 65. These values are slightly higher than those reported for Oregon, but typical for Nevada and other parts of sage grouse range.

Adult hens are the critical portion of the breeding population. On Sheldon, they typically constitute a large portion of the harvest. Based on the population estimate, 5% of the adult hens were harvested during the 2001 season. No guidelines for harvest rates on adult females and chicks are given, but these figures appear conservative. Careful monitoring is needed to ensure rates do not become too high. If new guidelines are developed, they should be applied.

**Risk: No harvest data for population estimates. Rated medium.**

Population estimates are derived from lek count data and production rates estimated from hunter-harvested wings. Brood routes are not a practical means of obtaining productivity information.

Although population trend can be estimated from lek counts alone, production data help determine whether recruitment rates are high enough to sustain a population. Nest success and

recruitment of juveniles into the population are usually cited as the most significant parameter influencing sage grouse population trend.

**Risk: Poaching. Rated low**

Poaching is always a risk, however we believe the risk on Sheldon is low. Poaching tends to occur more near large towns and cities. Due to its remote nature, few people would drive to Sheldon specifically to poach sage grouse. However, some poaching may occur incidentally to other recreational activities. Currently, USFWS and NDOW law enforcement patrol the refuge, especially during hunting seasons. On the risk assessment matrix, intensive law enforcement patrols refers to increasing patrols over the current level.

**Factor: Bird Health**

**Risk: Disease. Not considered a risk.**

Since 1998, sage grouse hens have been radio-marked for the OSU study. At time of capture, a blood sample is taken and sent to a lab for analysis. No evidence of disease or parasites have been found on Sheldon.

**Risk: Nutrition. Rated low.**

Intensive monitoring of sage grouse chicks during the OSU study has identified Aweak chick syndrome as one cause of chick mortality. These chicks are found dead within 48 hours of hatching, with carcasses intact. Lab necropsy is unable to ascertain cause of death, but can rule out predation or disease. Egg quality and hen nutrition may be related to this. Researchers plan to investigate the relationships during data analysis. Chicks were monitored during 2000, 2001, and 2002, but detailed analysis of these has yet to be conducted.

**Factor: Genetics**

**Risk: Unique population not viable. Does not apply**

**Risk: Unique population. Does not apply**

**Risk: Genetic mixing. Does not apply**

Radio-telemetry data show movement between Sheldon and Massacre PMUs and Sheldon and Beatty'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.

**Factor: Predation**

**Risk: Excessive nest losses by avian and mammalian predators. Rated low**

While radio-telemetry studies conducted by OSU demonstrate nest loss by predators, losses are not considered significant by WAFWA guidelines. Nest success ranged from 36 to

42% from 1998 to 2001. Nest success from various studies throughout sage grouse range varies from 12 to 86%. WAFWA guidelines recommend that predator management only be implemented if nest success is <25%. Results of raven control studies in Massacre PMU can be applied to management decisions on Sheldon regarding nest success.

While the future of OSU studies is in question right now, NDOW and USFWS will continue to monitor population and production trend through lek counts and wing composition.

**Risk: Excessive losses on broods by avian and mammalian predators. Rated low**

Poor productivity is often implicated as a reason for declining sage grouse populations. Mortality rates of young animals are often high and causes of chick mortality are rarely known. OSU is currently conducting a study to determine the timing and reasons for chick loss. Radio-marked chicks were followed during summers 2000-2002. Causes of chick mortality included predation, unknown causes, Aweak chick syndrome, and accidents. Detailed analysis of the data, yet to be conducted, will help determine if predation on broods is causing excessive loss.

**Risk: Excessive losses on adults by avian and mammalian predators. Rated: No risk**

In general, survival of adult sage grouse is high. Radio-telemetry studies of sage grouse on Sheldon have not identified a concern over adult survival rates.

## **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**

- USFWS will apply results of OSU study to management decisions
- NDOW and USFWS will develop spring and fall population estimates using lek and wing data.
- NDOW and USFWS will estimate chick survival and recruitment using hunter-collected wings.
- Data will be collected annually.
- NDOW and USFWS will collect wings from hunters to estimate production, annually
- USFWS will supplement aerial lek surveys with ground lek surveys
- NDOW and USFWS will use season timing, bag limits, and a permit system to control harvest levels, annually
- NDOW will conduct aerial surveys to track population trend and for population estimates, annually
- NDOW and USFWS will collect wing composition data to track reproductive trend and for population estimates, annually
- NDOW will use the 10% questionnaire.
- USFWS will use their questionnaire to monitor compliance with mandatory wing returns and determine number of permits needed to obtain an adequate sample of wings, annually
- USFWS may continue the study in 2003. Results of the study may be applied to management, if applicable.