NEVADA SAGE-GROUSE CONSERVATION PROJECT

W-64-R-8

Nevada Department of Wildlife

Governor's Sage-grouse Conservation Team
Bi-State Local Area Conservation Planning Group
Elko County Sage Grouse POD
Lincoln County Technical Review Team
North Central Local Area Conservation Planning Group
South Central Local Area Conservation Planning Group
Washoe-Lassen-Modoc Local Area Conservation Planning Group
White Pine County Local Area Conservation Planning Group

Photo by Marsha Warren – Lek Count Volunteer

September 2008

Nevada's Sage-grouse Conservation Project is a collection of jobs ranging from survey and inventory to conservation planning, research and project coordination. This document reports on all elements of the project.

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EXECUTIVE SUMMARY

The sage-grouse conservation project consists of four primary elements including survey and inventory, research, conservation planning and implementation, and coordination and administration. This progress report details work accomplished on all of the jobs within each element. Although Federal Aid is a major funding component of the overall project, significant efforts from federal agencies and conservation organizations are directed toward sage-grouse conservation. In addition, funds from the State of Nevada - General Fund, Question 1 bonds, and other Nevada Department of Wildlife (NDOW) funds (i.e. Habitat Conservation Fee) are utilized to augment sage-grouse conservation planning and projects. The distribution of W-64-R-8 grant expenditures for state fiscal year 2008 is depicted in Figure 1.

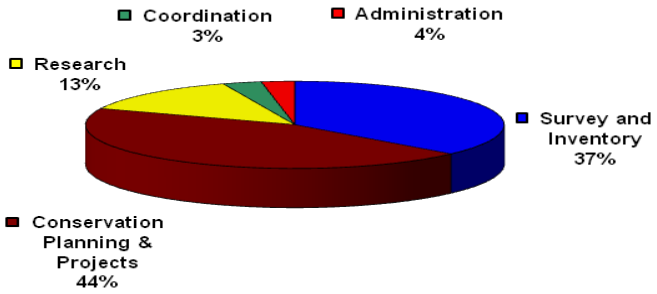

Figure 1. Distribution of W64-R-8 grant expenditures in fiscal year 2008.

A considerable amount of effort continues to be placed into monitoring sage-grouse during the breeding season. A total of 923 leks were visited at least once in Nevada by either ground or air. Of these leks, 483 (52%) were found to be active and a total of 7,671 sage-grouse were observed on these leks. This translated into an average of 15.9 birds per active lek. From an average lek attendance perspective, this represents a 15% decline when compared to 2007 average lek attendance rates of 20.3. Incorporating data collected in the California portion of the planning area (7 PMUs are shared with California), a minimum spring breeding population estimate range of between 79,501 and 98,131 sage-grouse was determined using a formula developed in the Plan. The 2007 population estimate range was between 89,934 and 112,549 for the Nevada, eastern California planning area.

Demographic parameters for sage-grouse were measured by classifying wings collected from hunter harvest birds taken during the 2007 hunting season. A total of 1,496 wings were gathered during the late September/early October hunt period. The number of adults far exceeded the number of chicks by a ratio of 2.75:1 and we estimated a production value of 0.58 chicks per hen. This production value is the lowest recorded since wings have been collected and represents the third straight year of relatively poor production values. Based on this information, we expect the sage-grouse population to continue to decline in most areas of the state until favorable spring moisture is received and habitat conditions subsequently improve.

In an effort to further define sage-grouse seasonal habitats and movement patterns, we conducted capture and follow-up efforts in several areas of White Pine County and in western Elko County. Work in White Pine County focused on pre-project monitoring for a number of proposed pinyon and juniper removal projects. Elko County efforts are focused on the effects that large wildfires are having on sage-grouse movements and habitat use. A total of 64 sage-grouse were captured as part of the population delineation project. Telemetry devices were attached to 45 birds consisting of 30 males and 15 females. NDOW is utilizing the services of

the Great Basin Bird Observatory (GBBO) for the majority of the follow-up work in White Pine County.

The Sage-grouse Conservation Team held 4 meetings during fiscal year 2008. These meetings focused on Bureau of Land Management – Healthy Lands Initiative projects, 2007 wildfire updates, litigation relative to Endangered Species Act listing, and updates on statewide interagency team. This team focused efforts on providing information to the U.S. Fish and Wildlife Service (USFWS) as they reviewed previous petitions to list the Mono Basin, western subspecies and Greater sage-grouse according to an Idaho District Court decision that remanded the original USFWS decision. Formation of interagency teams was largely an outcome of a meeting held between the USFWS, Natural Resource Conservation Service (NRCS), BLM and members of the Sage and Columbian Sharp-tailed grouse Technical Committee. Members of the Technical Committee subsequently spent a great deal of time coordinating and providing information to the Population Subcommittee of the Technical Committee to update the population status of sage-grouse across the range of the species. In addition to this, and in order to assist the USFWS, information was gathered and placed into a standard, rangewide "Conservation Efforts" database. Staff and field personnel with NDOW spent a considerable amount of time populating this database with project specific information from the U.S. Forest Service, NRCS, private landowners and NDOW's own projects.

Through this grant, NDOW provided funding to conduct or augment several projects throughout the state in fiscal year 2008. In Elko County, NDOW partnered with the BLM – Elko District by providing $45,000 to implement a weed treatment project in the Susie Creek and Dry Gulch drainages north of Carlin. This project should help protect and enhance sage-grouse brood rearing habitat in the future by controlling scotch thistle and hoary cress. In the Bi-State Planning Area, work was completed on the Sweetwater Flat Pinyon and Juniper Removal project. This multi-year project totaled 3,200 acres and should help protect and enhance sage-grouse breeding and nesting habitat. Funding was also provided to help the BLM – Winnemucca District re-seed portions of the Red Hills fire which burned some important habitat within the Santa Rosa PMU of the North Central Local Planning Area. A total of $64,000 was provided through this grant and NDOW Question 1 funds to purchase native seed for this restoration effort. Lastly, a contract is in place with the University of Nevada Cooperative Extension's "Bootstraps" program to implement a pinyon and juniper removal project within important sage-grouse habitats in the Roberts Creek Mountains located in Eureka County. The total contract amount for this project is $46,851 and is intended to enhance sage-grouse nesting and brood rearing habitats.

NDOW also provided its final contribution (as per the original contract) to the University of Nevada, Reno for the Falcon to Gonder Transmission Line Study located in Eureka County, Nevada. NDOW provided $50,000 per year over a five year period for a total of $250,000.00. The research is a long term (10-year) effort to measure the effects that this 345kV transmission line is having (or not having) on proximal and distal sage-grouse populations. Relatively little published literature, other than limited retrospective analyses, is available regarding the effects that transmission lines have on sage-grouse populations. This elevates the importance of continuing and completing this research. NDOW may contribute additional funds depending on the availability of obligations by other partners on the project.

SURVEY AND INVENTORY

Lek Monitoring

State: Nevada Grant Title: Nevada Sage-grouse Conservation Project

Grant No.: W-64-R-8 Sub-Grant Title: Survey & Inventory
Sub-Grant No.: I Project Title: Population Monitoring, Delineation and Demographics

Project No.: 1 Job Title: Lek Monitoring

Period Covered: July 1, 2007 – June 30, 2008
Report by: Shawn Espinosa, Mike Dobel, Larry Gilbertson and Steve Kimble

SUMMARY

Lek counts continue to be an important duty within the Nevada Department of Wildlife's (NDOW) annual work program. These surveys are emphasized in the recently completed *First Edition of the Greater Sage-grouse Conservation Plan for Nevada and Eastern California* (Plan). Within the Nevada portion of the planning area, NDOW field biologists, Bureau of Land Management (BLM) personnel, and volunteers collected data both from the ground using accepted protocols and aerially using a helicopter. The following information is provided to report progress in achieving objective #1 identified in the Grant Agreement, which states: "Conduct lek counts to determine population health and estimate the size of sage-grouse populations within distinct Population Management Units (PMUs)". Cumulative lek count data is reported within this section by Local Area Conservation Planning group for consistency with the Plan.

During the 2008 spring breeding season, 7,671 sage-grouse were counted on 483 active leks in Nevada for an average of 15.9 birds per active lek. From an average lek attendance perspective, this represents a 15% decline in the breeding population when compared to 2007 average lek attendance rates of 20.3. Incorporating data collected in the California portion of the planning area, a minimum spring breeding population estimate range of between 79,501 and 98,131 sage-grouse was determined using a formula developed in the Plan. These estimates must be viewed cautiously as comparisons between years are not statistically validated. The 2007 population estimate range was between 89,934 and 112,549 sage-grouse for the Nevada, eastern California planning area. Table 1 shows lek survey effort for the last seven years in Nevada.

	# Males	Leks Surveyed	Active Leks	AVG/active lek
2002	5,198	648	335	15.5
2003	4,624	380	248	18.6
2004	6,813	487	309	22.1
2005	8,843	635	332	26.6
2006	9,580	881	448	21.4
2007	11,040	1,013	545	20.3
2008	7,671	923	483	15.9

Table 1. Lek count summary from 2002 – 2008.

Significantly more effort has been placed into monitoring lek activity since the inception of the sage-grouse conservation-planning project began in 2000. In state fiscal year 2008, a total of **$158,913.46** was expended conducting lek monitoring activities. This value was very similar to 2007 estimated costs of $159,000.00 to complete this work. The original projected cost of conducting this work was **$231,200.00**. This equated to an under-expenditure of **$72,286.54**. Additional aerial lek surveys were expected; however, major repair work on one of the Department's two helicopters prevented the normal schedule of work from being completed.

OBJECTIVES

The primary objective of this monitoring is to document and analyze data pertaining to sage-grouse breeding activity. These data contribute to an understanding of population dynamics including, but not limited to, numerical trends, population status, distribution patterns and habitat selection. Lek site attributes can be used in an attempt to predict suitability indices to direct future searches for undocumented grounds, thus furthering the scientific description of the species' range in Nevada. Biologists use the data to calculate minimum spring breeding population estimates for many of the 64 identified PMUs. These estimates and trend analyses will be used to evaluate population viability, effectiveness of management practices and prioritization of conservation planning and achievement efforts. However, these population estimates are not statistically valid and merely represent a "best guess" as to what a population size might be. Comparisons from year to year should be viewed with this in mind as survey efforts change from year to year and some assumptions could be incorrect. Because there is such a large number of PMUs, data in this report will be summarized by Local Area Conservation Planning group for reading ease.

FINDINGS

WASHOE-LASSEN-MODOC

This particular planning area consists of five different Population Management Units (PMUs). Two PMUs, Vya and Buffalo/Skedaddle, cross state boundaries and are shared with California. In order to get a representative population estimate of these shared PMUs, data from lek counts conducted in California are also utilized in the population estimate calculation.

During the spring breeding season of 2008, biologists and volunteers visited 112 leks within these 5 PMUs. Of these leks, 80 were active with at least one male attending the lek. A total of 1,554 males were observed on these leks (the total is comprised of peak lek counts for leks visited multiple times as well counts from leks visited only once). In the Nevada portion of the planning area, at total of 53 leks had at least one male attending the lek and a total of 1,074 males were observed by biologists and volunteers. This is a large decline from 2007 observations in which 2,246 males were observed.

Using population estimate calculations previously developed, and incorporating data from the California portion of the planning area, a minimum spring breeding population estimate of 9,550 sage-grouse was determined for the Washoe-Lassen-Modoc planning area. This represents a 41.2% decrease from the 2007 minimum spring breeding population estimate of 16,246 sage-grouse.

All of the PMUs within this planning area experienced population decreases from 2007 to 2008. Overall, poor recruitment for the last three years is to blame for the downward trend of this and other sage-grouse populations. Declines were less severe in the Buffalo/Skedaddle PMU than other Washoe/Lassen/Modoc PMUs as lek counts from this PMU resulted in a 19.7% population estimate decline from 2007. Population declines were more severe for the Massacre,

Vya and Sheldon PMUs as declines ranged from 44%, 41% and 50% respectively from 2007 estimates. The Virginia/Pah Rah PMU may have experienced the greatest population decline of any PMU within this planning area at 70% from 2007 estimates; however, access to one of the largest leks in this PMU (Spanish Flat) was severely limited by remnant snow banks and only one count was obtained.

BI-STATE PLANNING AREA

The Bi-State planning area, like Washoe-Lassen-Modoc, is also a region where population management units (PMUs) are shared between Nevada and California. Five of the PMUs in this region are shared between the two states while one is entirely within California (South Mono PMU). The PMU boundaries were delineated to account for the movement of birds across state lines.

During the spring of 2008, a total of 13 lek locations were visited by NDOW biologists and volunteers. Of these, just 7 were considered active with at least one male sage-grouse in attendance. Sixty-eight males were observed at these 7 active leks for an average attendance of 9.7 males per active lek. In 2007, the average lek attendance was 12.1 males per active lek. The 2008 lek counts represent an approximate 20% decline in attendance. Poor recruitment due to marginal precipitation receipts over the past several years is likely the major factor contributing to the population decline. However, lack of consistently collected data at high elevation leks that are surveyed aerially in the Mount Grant PMU, coupled with the occurrence of a large wildfire that severely impacted the breeding and nesting habitat of the Pine Nut PMU are contributing to this decline. Table 2 shows the lek count efforts of each state within the planning area for 2007. Important information was obtained by the California Department of Fish and Game in April of 2008 pertaining to the White Mountains PMU. An aerial (helicopter) lek survey detected a total of 33 sage-grouse at 9 different locations (mostly between 9,000 and 9,700 feet). Follow-up surveys in 2009 could lead to the discovery of a viable lek within this difficult to survey and inadequately understood PMU.

PMU	Total Known Leks	# of Leks Surveyed	# of Active Leks	# of Males Counted	Avg. # of Males/Active Lek
Desert Creek/Fales	23	5	5	65	13
NV Portion	(12)	(3)	(3)	(42)	(14)
CA Portion	(4)	(2)	(2)	(23)	(11.5)
Mt. Grant (NV)	10	5	3	20	6.7
Pine Nut (NV)	11	5	1	6	6
White Mountains	5	0	0	0	0
Bodie Hills (CA)	18	12	10	136	13.6
South Mono (CA)	22	11	9	206	22.9
TOTAL:	**89**	**38**	**28**	**433**	**15.5**

Table 2. 2008 lek count effort for the Bi-State local conservation planning area.

The minimum spring breeding population estimate for the entire Bi-State local conservation planning area for 2008 was 2,690. This is a 36% decrease from the 2007 population estimate of 4,198 and a 47% decrease from the 2006 estimate of 5,078. All five PMUs experienced population declines. Much of this is attributable to poor spring weather conditions over the past two years; however, some of the decline is likely because of cumulative effects from ex-urban development, habitat degradation and possibly even West Nile virus (positive detections in both California and Nevada).

NORTH CENTRAL PLANNING AREA

The North Central planning area is composed of Churchill, Pershing and Humboldt Counties. There are 19 Population Management Units (PMUs) within this planning area, many of which encompass isolated, dry, single ridge mountain ranges with small populations of sage-grouse. Some PMUs can be considered disconnected with other major sage-grouse populations lying to the north, west and east. However, the planning area contains some very important PMUs in Nevada with significant populations of sage-grouse in the Lone Willow and Santa Rosa PMUs.

Many areas of Humboldt County are remote and spring road conditions often limit access to many areas. During the spring of 2008, many roads were impassible due to snow drifts that remained from the winter. As is often the case, aerial survey often provides the bulk of data for this particular area, but some ground counts are conducted. The Bureau of Land Management once again provided the majority of funding for contract aerial services through a cooperative agreement. Table 3 shows the results of lek count work conducted during 2008.

PMU	Total Known Leks	# of Leks Surveyed	# of Active Leks Surveyed	# of Birds Counted	Avg. # of Birds/Active Lek
Santa Rosa	125	84	30	461	15.4
Lone Willow	93	81	38	402	10.6
Pine Forest	13	13	8	143	17.9
Black Rock	22	8	5	82	16.4
Jackson	7	0	0	0	0
TOTAL:	**260**	**186**	**81**	**1088**	**13.4**

Table 3. Results of Humboldt County lek counts conducted in 2008.

In the larger sage-grouse population areas located in Humboldt County, lek count data revealed a population decrease in all areas except for the Lone Willow PMU. The average number of sage-grouse per active lek decreased in the Pine Forest, Black Rock and Santa Rosa PMUs by -22.8%, -20.7%, -23% respectively from 2007. Lek counts in the Lone Willow PMU (mainly aerial survey) showed an increase attendance of 10.4%. During the spring of 2008, a total of 186 lek locations were visited of which 81 were considered active. A total of 1,088 sage-grouse were observed on these active leks.

A total of 40 leks were visited in the Pershing County portion of this planning unit and 118 sage-grouse were observed on 17 active leks. This translates into an average of 6.9 birds per active lek. Lek surveys in these small, isolated Pershing County PMUs are too inconsistent to provide any meaningful comparisons from year to year. Wildfires have taken a significant toll on the small populations of sage-grouse located in the Eugene and East Range Population Management Units. It is now difficult to find any birds in either of these PMUs let alone an active lek.

In the Churchill County portion of this planning area, leks are surveyed in two of the three PMUs here. Both ground and aerial surveys are conducted in the Clan Alpine and Desatoya PMUs. In 2008, a total of 11 leks were visited with 9 of those being active. A total of 180 sage-grouse were observed for an average of 20 birds per active lek. Only one lek was surveyed in the Clan Alpine PMU. Lek counts conducted in the Desatoya PMU yielded 156 males on 8 active leks. The 2008 minimum spring breeding population estimate for the Desatoya PMU was 975.

In summary, a total of 247 lek locations were visited and 1,388 sage-grouse were counted on 108 active leks within the North Central Planning Area in 2008. Lek sites were visited in 12 of the 19 PMUs within this planning area. No lek location data exists for at least 4 of the 7 remaining PMUs within this planning area including the Limbo, Sahwave, Nightingale and Eden Valley PMUs.

SOUTH CENTRAL PLANNING AREA

The South Central planning area consists of Lander, Eureka, and Nye Counties. This planning area includes 10 Population Management Units (PMUs). A total of 1,208 male sage-grouse were observed on 58 active leks during the spring of 2008 (see Table 5 for complete data) for an average of 20.8 males per active lek. In comparison, the average number of males per active lek was estimated at 25.4 in 2007 translating into an 18.1% decline in lek attendance. Lek count data from 2008 generated a minimum spring breeding population estimate of 13,213 for these 10 PMUs. This figure represents a 21% decrease when compared to the 2007 estimate of 16,742 and follows a 7.5% decline from 2006 to 2007.

PMU	Total Known Leks	# of Leks Surveyed	# of Active Leks Surveyed	# of males Counted	Avg. # of males/Active Lek
Battle Mountain	7	0	-	--	--
Fish Creek	6	1	1	10	--
Shoshone	14	8	6	64	10.7
Cortez	28	5	5	86	17.2
Three Bar	51	11	11	236	21.5
Diamond	35	5	4	74	18.5
Toiyabe	68	9	8	169	21.1
Reese River	44	4	4	161	40.3
Monitor	69	45	19	408	21.5
Kawich	0	0	0	N/A	N/A
TOTAL:	**322**	**88**	**58**	**1,208**	**20.8**

Table 4. 2008 lek count effort within the South Central local conservation planning area.

Fewer leks were visited and counted in Lander County because of the retirement of the longstanding field biologist for that county. Some leks were counted by volunteers and eventually by the new field biologist for Lander County. The Toiyabe and Shoshone PMUs harbor the largest sage-grouse populations in Lander County. Average male attendance for trend leks in the Shoshone PMU (2 trend leks) has decreased from a 10-year high of 34.5 males per lek in 2006 to 13.5 males per lek this year. This represents a 61% decrease in attendance of those grounds. Similarly, in the Toiyabe PMU average male attendance on three trend grounds has decreased from the 10-year high of 64.3 males per lek in 2006 to 22.7 males per lek this year representing a 65% decrease in cumulative attendance for those leks.

In Nye County, there are 14 trend leks that are counted multiple times each year. During the 2008 spring breeding season peak counts on these leks (439 males counted) resulted in an average of 31.4 males per trend ground. This average is down 26.5% from the previous year's average of 42.7 males per lek. This decline is consistent with the overall population downturn for the Reese River and Monitor PMUs (the two major PMUs in Nye County) estimated at -25.5%.

There are a total of 10 trend leks distributed throughout 3 different PMUs in Eureka County. Each of these leks is counted multiple times in the spring each year. In 2008, peak male attendance on these 10 leks was 216 males for an average of 21.6 males per lek. This

value represents a 24.5% decrease in male attendance compared to 2007 values (286 males counted). This follows a 30.4% decrease that was realized from 2006 to 2007. The 2008 average attendance values were also 17% below the 20-year average (calculated from 1986 to 2005) of 26 males/lek. A total of 21 leks were surveyed in the Cortez, Diamond and Three Bar PMUs in 2008 with a peak attendance of 396 males counted on 20 active leks. The mean attendance for all active leks was 19.8. In comparison, 443 males were counted on 19 active leks in 2007 for a mean attendance of 23.3 males/lek.

ELKO COUNTY

There are a total of 10 PMUs within this planning area. Lek monitoring efforts were coordinated between Elko NDOW, USFS and BLM Field Office personnel as well as volunteers. Monitoring by NDOW personnel focused on trend ground counts and ground-truthing of existing leks in the database while accompanying BLM personnel with directed efforts towards checking leks for activity associated with burned areas or in areas that have little historic data available. USFS personnel and volunteer's assisted with lek occupancy and lek counts.

A tremendous amount of habitat, much of it being sage-grouse habitat, has burned over the last 10 years in Elko County. Nevada experienced somewhat of a reprieve in 2008 with only one major fire in Elko County that burned within the Jarbidge wilderness near the Idaho border. The cumulative effect of these fires has taken a toll on sage-grouse populations throughout this county. Of the estimated 950 or so active leks within Nevada, 410 (43%) are located within Elko County. Wildfires burned over 69 leks in 2007 and 52 were monitored in 2008. Only 11 of these were found to be active in 2008 after being burned in 2007.

Nevada Department of Wildlife personnel monitored 14 trend leks in Elko County in 2008. A total of 601 sage-grouse males were observed translating into an average of 43 males/lek. This attendance represented a 22% decline from 2007 numbers. There are still a substantial number of lek locations that need to be evaluated as to whether they were simply one-time sightings or if they are actual strutting grounds.

A total of 388 leks were visited at least once during the spring of 2008 in Elko County. Of these, 178 were classified as active and 2,854 sage-grouse were observed on these active leks for an average of 16 birds per active lek. In PMUs where there has been a consistent sampling effort, most show a population decline from 2007. The average number of sage-grouse per active lek decreased in the Gollaher, North Fork, O'Neil Basin, and the South Fork PMU by 10.1%, 11.5%, 10.5% and 30.4% respectively from 2007. The average number of birds per active lek remained stable in the East Valley PMU.

LINCOLN COUNTY TECHNICAL REVIEW TEAM

The Lincoln County LACP consists of three separate PMUs: Lincoln, Steptoe/Cave, and the Quinn. The Quinn PMU is mostly within Nye County, but planning and implementation activities rest with this local working group. Very little data currently exists regarding recent sage-grouse activity within the Quinn PMU. On the other hand, intensive efforts to survey leks and the use of telemetry marked sage-grouse in the Lincoln PMU has greatly contributed to a useful dataset and allowed the documentation of previously undiscovered lek locations.

A total of 257 male sage-grouse were reported on 22 active leks within the Lincoln and Steptoe/Cave (south) during the 2008 spring breeding season. This yielded an average of 11.5 males per active lek which is similar to the 2007 average of 11.7. The 2008 minimum spring breeding population estimate for the Lincoln PMU and south half of the Steptoe/Cave PMU is 1,032 sage-grouse. This represents a 17% decrease from the 2007 minimum spring breeding population estimate of 1,244. Once again, dry spring and early summer conditions in 2007 likely

played a role in decreased production. Being that the spring of 2008 was very dry in Lincoln County; the population's ability to increase or expand is very limited.

Populations of sage-grouse within the Lincoln and Steptoe/Cave (south) PMUs seem to be fairly stable, but relatively small. However, limited habitat, poor weather conditions for the last several years and the continued threat of utility scale wind energy development in key nesting and brood rearing habitat on Table Mountain within the Lincoln PMU places the long-term sustainability of this population in question.

WHITE PINE COUNTY LACP

The White Pine planning area mainly resides within the confines of White Pine County, with some minor exceptions. The majority of three PMUs (Butte/Buck/White Pine, Schell/Antelope, and Snake Valley) are within White Pine County. Two other PMUs (Diamond and Steptoe/Cave) are partially within White Pine County.

Lek monitoring efforts were conducted by Ely District BLM, Ely USFS Ranger District, Great Basin National Park, NDOW, SNWA (Southern Nevada Water Authority) GBI (Great Basin Institute) and TNC (The Nature Conservancy) personnel. A total of 75 leks were visited in 2008 with 57 (76%) observed to be active and 16 either unknown or inactive. Four potentially new leks were discovered and two potential leks from last year were confirmed. A total of 822 males were counted resulting in 14.4 males/active lek. In comparison, 89 leks were checked in 2007 with 65 (73%) observed to be active. A total of 1,214 males were counted resulting in 18.7 males/active lek. Various agency personnel monitored 23 trend leks in 2008 with 270 males observed resulting in 11.7 males/lek average. In 2007, 381 males were observed yielding 16.6 males/lek average. This indicated a 30% decrease in population trend from 2007.

The 2008 minimum spring breeding population estimate for the entire White Pine planning area was calculated at 6,505 sage grouse. This represents a 25% decrease from the 2007 minimum estimate of 8,669 sage grouse. This is the first recorded population decrease for the White Pine planning area since 2004.

Population Demography

Report by: Shawn Espinosa

OBJECTIVES

This section describes work conducted to achieve objective #2 stated in the Grant Agreement for Sub-grant I, Project #1 which states, "determine age structure, sex ratios, and nest success values for various sage-grouse populations through collection and analysis of wings from hunter harvested sage-grouse…"

SUMMARY

The Nevada Department of Wildlife continues to collect sage-grouse wings from hunter harvested sage-grouse through the use of wing barrels placed at strategic locations and drop-off at regional offices. Requests are made through regulations brochures and the Nevada Hunt Book to deposit wings at these locations. Additionally, harvest rates are used to help determine if hunting season strategies meet the guidelines suggested by the Western Association of Fish and Wildlife Agencies (Connelly et al. 2000) for sage-grouse.

Envelopes with questionnaire labels are available at wing barrels to determine the location of harvest and other information. Once wings have been collected, they are separated by Population Management Unit. These wings are analyzed at an annual Wing Bee where biologists gather from around the state to analyze the wings. The Braun (1970) wing key for age and sex classes of sage grouse is used to classify wings.

During the 2007 hunting season, a total of 1,496 wings were gathered. This is down substantially from the previous year's wing collection of 2,813 wings. The classification of wings is presented in Table 5. Not surprisingly, the number of adults collected far exceeded the number of chicks by a ratio of 2.75:1. A statewide chick per hen value of 0.58 was estimated from the 2007 collection of wings. This recruitment value is the lowest ever recorded in Nevada and represents the third consecutive year of relatively poor recruitment values.

2007 SAGE-GROUSE DEMOGRAPHY
ESTIMATED VIA HUNTER HARVESTED WINGS

AREA	ADULTS		JUVENILES		TOTAL SAMPLE	CHICKS /HEN
	Males	Females	Males	Females		
Western Region						
Sheldon PMU (033)	17	42	4	12	75	0.38
Buffalo/Skedaddle PMU	0	8	5	3	16	1.00
Massacre PMU	41	51	10	19	121	0.57
Vya PMU	0	5	5	5	15	2.00
Other Washoe Co.	5	4	4	0	13	1.00
Santa Rosa PMU	46	88	10	24	168	0.39
Lone Willow PMU	45	57	28	18	148	0.81
Desatoya PMU*	44	68	3	8	123	0.16
Pine Forest PMU	**Season Closed**					
Black Rock PMU	8	12	0	4	24	0.33

2007 SAGE-GROUSE DEMOGRAPHY ESTIMATED VIA HUNTER HARVESTED WINGS (continued)						
AREA	ADULTS		JUVENILES		TOTAL SAMPLE	CHICKS /HEN
	Males	Females	Males	Females		
Eastern Region						
Desert PMU	0	0	0	0	0	N/A
Tuscarora PMU	15	10	1	1	27	0.20
Northfork PMU	23	63	33	28	147	0.97
Island PMU	4	11	3	3	21	0.55
O'Neil PMU	7	17	5	7	36	0.71
Snake PMU	26	35	7	10	78	0.49
Gollaher PMU	5	13	3	6	27	0.69
Ruby Valley PMU	7	7	2	2	18	0.57
Southfork PMU	23	48	8	17	96	0.52
East Valley PMU	**Season Closed**					
Diamond PMU	3	6	1	0	10	0.17
Cortez PMU	20	33	3	15	71	0.55
Three Bar PMU	18	27	9	8	62	0.63
Shoshone PMU	7	9	3	1	20	0.44
Toiyabe PMU	48	56	4	13	121	0.30
Butte/Buck/White Pine PMU	13	22	6	10	51	0.73
Schell/Antelope PMU	2	2	0	0	4	0.00
Spring/Snake PMU	0	0	0	0	0	N/A
Steptoe/Cave PMU	0	0	0	0	0	N/A
Southern Region						
Monitor PMU	22	44	15	19	100	0.77
Reese River PMU	8	14	2	3	27	0.36
Totals:	**413**	**684**	**171**	**228**	**1,496**	**0.58**

Table 5. Wing-Bee Results from the 2007 Nevada sage-grouse hunt.
* 2007 represented the first year that the Desatoya PMU has had an open sage-grouse season in the past decade.

Nest success characteristics have been analyzed at the annual wing-bee since 2002. The 2007 nest success was estimated at 31% in 2007. This value was the same as that recorded in 2006 and remains the lowest recorded since this demographic parameter has been analyzed. The value is 12% lower than the 5-year average of 43% nest success.

The Great Basin received almost average precipitation from October 1, 2007 through September 1, 2008; however, the timing of the precipitation receipts overall was not conducive to good nesting and reproduction throughout the state as the majority of precipitation was received in January and early February followed by an extended dry period that lasted through the end of May. Overall, Nevada fared better than last year in terms of precipitation and overall habitat conditions. Table 2 shows production values for the last five years in various sample units.

SAGE-GROUSE PRODUCTION (chicks per hen) LAST FIVE YEARS						
AREA	**2003**	**2004**	**2005**	**2006**	**2007**	**AVERAGE**
Sheldon PMU	1.44	2.10	1.24	2.82	0.38	1.60
Massacre PMU		1.74	1.10	1.27	0.57	1.17
Vya PMU		1.63	0.79	0.25	2.00	1.17
Santa Rosa PMU	1.91	0.57	1.67	0.67	0.39	1.04
Lone Willow PMU	2.38	3.02	1.70	0.90	0.81	1.76
Snake PMU	2.70	1.15	1.10	1.21	0.49	1.33
Elko County	1.58	1.37	1.69	1.61	0.67	1.38
Eureka County	1.86	2.04	2.17	1.21	0.55	1.57
Lander County	3.10	2.50	5.13	1.25	0.32	2.46
White Pine LACP	2.79	2.53	1.64	1.92	0.67	1.91
Nye County	2.45	1.00	2.57	2.18	0.67	1.77
Statewide Average	2.14	1.90	1.69	1.13	0.58	1.49
Sample Size	2,523	3,091	2,984	2,813	1,496	2,581
Statewide Harvest	4,557	5,244	3,176	3,710	4,897	4,316
% of Harvest in Sample	**55%**	**59%**	**94%**	**76%**	**31%**	63%

Table 6. Five-year production values for sage-grouse via analysis of wings.

The effort to collect and properly analyze sage-grouse wings has increased substantially in this decade compared to prior decades. Biologists have relied upon the strategic placement of sage-grouse wing barrels and hunter education to increase the proportion of wings collected in relation to the total statewide estimated harvest. Actual harvest data are derived from the annual Upland Game and Waterfowl Harvest Questionnaire, thus the calculated number of birds harvested from questionnaire data is merely an estimate.

Population Delineation

Reports by: Shawn Espinosa, Ken Gray, Curt Baughman and John Boone (GBB0)

OBJECTIVES

This section describes the work conducted to help achieve objective #5 identified in the Grant Agreement for Sub-grant I, Project #1. The statement basically identified three different objectives related to radio marking efforts and includes the following:

- Verify and/or refine population management unit boundaries that were delineated based on little information or biologist judgment;
- Determine migratory nature of specific populations; and
- Determine response of sage-grouse populations to various treatments or conservation efforts.

SUMMARY

The attachment of radio transmitters to sage-grouse is a technique widely used to delineate the birds' seasonal distribution and movement corridors. Standard (VHF) transmitters require regular ground and aerial follow-up, which is labor and equipment intensive.

During state fiscal year 2008, the Nevada Department of Wildlife conducted capture and follow-up efforts in several areas of White Pine County and in western Elko County within the Tuscarora PMU (summaries provided below). A total of 64 sage-grouse were captured as part of the population delineation project. Telemetry devices were attached to 45 birds consisting of 30 males and 15 females. Only leg bands were applied to the remainder of the captured birds, mainly because these birds were males. NDOW is utilizing the services of the Great Basin Bird Observatory (GBBO) for the majority of the follow-up work in White Pine County. Other sage-grouse captures and seasonal habitat delineation projects took place in areas such as Lincoln County; however, results from that effort are not reported here because it is part of ongoing pre-project monitoring for a proposed wind energy facility in the Mount Wilson/White Rock/Table Mountain area and no W-64-R-8 Grant funds were utilized for this project.

White Pine County

Several efforts to capture, radio mark and band sage-grouse occurred during fiscal year 2008 in White Pine County. Some captures were conducted to gain additional information on seasonal movements of sage-grouse as part of the potential planning and permitting process for wind energy developments. Other captures were conducted to learn more about sage-grouse use of properties acquired by the Southern Nevada Water Authority for transfer of water to Las Vegas. In addition to these efforts, the Nevada Department of Wildlife utilized the services and assisted the Great Basin Bird Observatory with the capture of sage-grouse in four different locations to gain pre-treatment information regarding sage-grouse habitat utilization and distribution patterns prior to conducting pinyon and juniper removal projects in existing sagebrush habitat.

Duck Creek Basin

During September and October of 2007, a total of 7 sage-grouse consisting of 4 males and 3 females were captured and banded in the Duck Creek Basin located in the Schell Creek

Range. Of these birds, 3 males and 3 females were radio-marked. Approximately 14 follow-up surveys were conducted through June of 2008. Most of the follow-up surveys were conducted from the ground, supplemented by two aerial surveys. During this period, one male was determined dead in early June and one female was missing (likely dead). Of three hens, two attempted nesting, but the attempts failed in both cases. One nest was predated, probably by ravens. The other nest failed for unknown reasons. These birds have remained in an elevation zone between 7,000 and 9,000 feet and have not exhibited long distance movements (>10 km) to date. However, there has been a tendency among most of the birds to exhibit seasonal changes in elevation.

North Spring Valley

In April of 2008, 14 sage-grouse were captured and banded in North Spring Valley, located in the Schell/Antelope PMU. These grouse were captured near leks that were chosen for their location close to areas scheduled for pinyon and juniper tree removal. VHF telemetry devices were placed on 7 of these birds consisting of 5 males and 2 females. Follow-up surveys were conducted between four and six times for these birds. These follow-up attempts were mainly from the ground with one to two aerial surveys. Of the 2 hens, none were observed with chicks during follow-up surveys. Most birds moved to the Schell Creek Range in June and it is likely that this area is their summer range.

South Spring Valley

The Southern Nevada Water Authority, with the assistance of Nevada Department of Wildlife personnel, conducted capture efforts on 5 different nights during the spring of 2008. A total of 9 sage-grouse were captured consisting of 8 males and 1 female. Most of the birds were captured from the vicinity of the Cleve Creek, Lincoln and Kirkeby Knoll lek areas. VHF telemetry devices and leg bands were placed on 6 males and the hen while only leg bands were placed on the remaining 2 males. All follow-up surveys were conducted from the ground. Anywhere from 8 to 14 follow-up surveys were conducted during the spring and early summer. Three males died during the period with all mortalities caused from predation. Follow up surveys have indicated that the majority of these birds remain associated with wet meadows located on several ranches within South Spring Valley. Some birds were found to be associated with the Cleve Creek drainage.

Steptoe Valley

In April and May of 2008, a total of 25 sage-grouse were captured in the south Steptoe Valley area. Of these birds, 6 were radio-marked consisting of one hen and 5 males. One of the males has since died. All other birds captured were males and were leg banded only. Grouse were captured in the vicinity of three different leks including the Williams Creek, North Lund Group Well and North Cattle Camp Wash leks. Follow-up monitoring during the spring and early summer has mainly been conducted from the ground with one aerial survey. This monitoring has indicated that grouse in this valley scatter widely from the lekking areas following the breeding season. Three birds, including the hen, remained within a relatively consistent elevation zone throughout the summer and early fall. To varying degrees, they moved farther south and southeast in the valley from their original locations. The remaining birds moved to higher elevations for the summer in the Ward Mountain area located in the Egan Range.

In addition to the capture and follow-up efforts above, one female sage-grouse was also captured in the vicinity of the Steptoe Valley Wildlife Management Area located just south of Ely. Ten follow-up surveys were conducted to locate this female during the spring and early summer.

This hen nested successfully and was documented with a brood repeatedly in the vicinity of a broad un-grazed meadow above Comins Lake on the Steptoe Valley Wildlife Management Area. All of the observations for this hen (March through June) were confined to an area of roughly four square miles.

Tuscarora PMU

Capture and marking efforts were initiated within this PMU in the spring of 2007 in order to determine the effects of large-scale wildfires on the sage-grouse population. This particular PMU has experienced the most severe habitat losses of any PMU in Nevada. Capture attempts were made in the Willow Creek area of the Tuscarora Range in the spring of 2008. A total of 9 sage-grouse were radio-marked in this area and several follow-up surveys were conducted to document their movements. Previous capture efforts were conducted in 2007 in the Sixmile and Susie Creek/Swales areas with only males captured and radio marked. Since this effort all of these birds have died.

Some hypotheses that we would like to test in the future include the following:

1) Habitat degraded by wildfire decreases nutritional levels in sage-grouse and places greater stress on sage-grouse during the breeding period.
2) Reduced overall cover within and adjacent to breeding and nesting habitat due to wildfire increases the predation rate on both hens and males during the breeding period.

Below is a short summary to describe the activities associated with this project in state fiscal year 2008.

Willow Creek

During state fiscal year 2008, a total of 7 hens and 2 male sage-grouse were captured and outfitted with VHF telemetry collars and metal leg bands. All of these birds were captured on Willow Creek ridge.

Since the capture effort in the spring of 2008, follow-up surveys have occurred 8 times including 3 fixed wing aerial surveys and 5 ground surveys. One remaining male from capture efforts in 2007 continues to be monitored. Of the 10 grouse monitored during this time frame, one male has died and one of the collars appears to be non-functional while the other 8 remain active.

Monitoring has indicated that hen movement from their breeding habitat to their summer habitat ranged from 3 to 18 miles with the average movement being about 9 miles. Two of the hens ended up in a different watershed from where they were captured. No chicks were observed with any of the females. The three males ranged from one mile of movement from their leks to 9 miles with the average movement being about 5 miles.

CONSERVATION PLANNING

Governor's Strategic Planning

State: Nevada Grant Title: Nevada Sage-grouse Conservation Project

Grant No.: W-64-R-8 Sub-Grant Title: Conservation Planning
Sub-Grant No.: II Project Name: Statewide Planning
Project No.: 1 Job Title: Statewide Strategic Planning
Job No.: 1

Period Covered: July 1, 2007 – June 30, 2008
Report by: Shawn Espinosa

OBJECTIVES

The major objective of the Nevada Governor's Sage-grouse Conservation Team (SGCT) is to assist local working groups with the implementation of prioritized projects. Other objectives include completing the Second Edition of the Greater Sage-grouse Conservation Plan for Nevada and Eastern California and developing semi-annual workshops.

SUMMARY

The SGCT held 4 meetings during fiscal year 2008. The meetings focused on the following:

- State of Nevada legislative updates;
- Bureau of Land Management Healthy Lands Initiative projects;
- 2007 wildfire updates;
- Sage-grouse petition (litigation) updates;
- Sage-grouse population status and trend;
- The 4-State Memorandum of Understanding – "War on Cheatgrass"
- Priority sage-grouse habitat mapping; and
- Statewide Interagency Team update developed to provide information to the U.S. Fish and Wildlife Service regarding the status of sage-grouse and sage-grouse conservation projects.

The SGCT reviewed recently completed PMU plans from the North Central Local Working Group and provided feedback on improving those plans. Additionally, letters to Nevada's Congressional Delegation were also finalized regarding lands bills and wilderness designations around the state and the impacts that can have on sage-grouse and habitat management.

A total of **$16,000.00** was identified to complete two specific jobs under Sub-grant II (Conservation Planning), Project #1 (Statewide Conservation Planning): Job #1 (Statewide Governor's Strategic Planning) and Job #2 (Sage and Columbian Sharp-tailed grouse Technical Committee). In state fiscal year 2008, **$8,643.21** was expended on this particular job while **$12,564.69** was expended conducting work related to the Technical Committee. The total for conducting work on both jobs was **$21,207.89** which represents an over-expenditure of **$5,207.89**. This is largely due to the unforeseen amount of work related to the U.S. Fish and Wildlife Service's data call for sage-grouse and the establishment of Interagency Teams to assist the Service.

Sage and Columbian Sharp-tailed grouse Technical Committee

State: Nevada Grant Title: Nevada Sage-grouse Conservation Project

Grant No.: W-64-R-8 Sub-Grant Title: Conservation Planning
Sub-Grant No.: II Project Job Title: Statewide Planning
Project No.: 1 Job Title: Sage and Columbian Sharp-tailed grouse Technical Committee
Job No.: 2

Period Covered: July 1, 2007 – June 30, 2008
Report by: Shawn Espinosa

SUMMARY

In February of 2008, members of the Sage and Columbian Sharp-tailed grouse Technical Committee (Technical Committee) met with U.S. Fish and Wildlife (USFWS) personnel to determine a course of action to aid the USFWS in collecting information regarding the status of sage-grouse populations and to determine the number and scale of conservation efforts across the range of the species. During this meeting, it was determined that each state would develop inter-agency teams (IA Team) to gather information within their respective states. It was also determined that the Population Subcommittee of the Technical Committee would update the Populations Status chapter (Chapter 6) of the original Sage-grouse Conservation Assessment

The Nevada IA Team was formed in March and consisted of representatives from the Bureau of Land Management, U.S. Forest Service, Natural Resource Conservation Service, the Nevada Department of Wildlife (NDOW) and the Nevada Cattleman's Association. As a group, this team determined that it would be most appropriate to use existing "project worksheets" in order to gain the necessary information attributes regarding each project in order to populate the USFWS established "Conservation Efforts" database. Team members went to their respective agencies and requested information from the field. Once this information was collected it was provided to the NDOW Upland Game Staff Specialist for entry into the database. Staff from RCI were also contracted to enter a portion of the data.

Three different Conservation Efforts databases were provided to the USFWS by Nevada. NDOW staff consolidated projects from the USFS, NDOW, Eastern Nevada Landscape Coalition and private lands. This database consisted of 61 projects. The NRCS submitted a separate database via NDOW. This database consisted of 32 projects. Also, the BLM submitted their own suite of projects and provided their database directly to the USFWS. This effort amounted to 109 total projects. All of this information was provided to the USFWS in June of 2008.

The 26th Sage and Columbian Sharp-tailed grouse Workshop was held in June of 2008. The technical committee held a business meeting and the workshop included two days of general program plus a one day field trip. Staff provided a comprehensive presentation on fire effects to sage-grouse for this workshop.

A total of **$12,564.69** was expended on this job in fiscal year 2008. A total of **$16,000**.00 was identified for Sub-grant II, Project 1, Job #1 and #2 under the W-64-R-8 Grant Agreement. Total expenditure for these two jobs amounted to **21,207.89** which represented an over-expenditure of **$5,207.89**. This is largely due to the unforeseen amount of work related to the U.S. Fish and Wildlife Service's data call for sage-grouse and the establishment of Interagency Teams to assist the Service.

Database Management

State: Nevada Grant Title: Nevada Sage-grouse Conservation Project

Grant No.: W-64-R-8 Sub-Grant Title: Conservation Planning
Sub-Grant No.: II Project Name: Database Management
Project No.: 2

Period Covered: July 1, 2007 – June 30, 2008
Report by: Shawn Espinosa

OBJECTIVES

This section addresses the following objectives identified in the Grant Ageement for this project and job:

1) Keep an organized and comprehensive database for sage-grouse lek counts, telemetry studies, harvest data and wing bee and banding information.

This job also addresses objective #4 within Sub-grant I, Project #1 which identifies the need to maintain a historical distribution database.

SUMMARY

The Nevada Department of Wildlife – GIS section houses 5 main databases for sage-grouse consisting of the following:

1) Lek History
2) Annual Lek Surveys
3) Sage-grouse Observations (Historical Information)
4) Sage-grouse Telemetry
5) Brood Surveys

The Lek History database contains 9,598 records and represents a cumulative history of lek count data over time. This database allows us to analyze trend and population performance. The database is updated annually.

The Annual Lek Survey database has recently undergone reconstruction utilizing a grant that became available to the Nevada Department of Wildlife in January from the USGS. This grant opportunity was developed to enable sage-grouse databases around the west to become more compatible. To accomplish this, the USGS gathered field and attribute names from several databases around the west and developed a spreadsheet that displayed this information. NDOW GIS section staff and Game Division staff reviewed this material and modified our existing database to include pertinent fields as well as use more common field names. Additionally, NDOW purchased server software that would enable field biologists to directly enter lek count or survey data directly into the database over our intranet. GIS staff developed Microsoft Access based forms that accurately recorded all pertinent information for use on the intranet. This will allow for greater ease of updating the database on an annual basis and integration into a rangewide database.

The Sage-grouse Observation database is the framework for the historic distribution database. This database currently has 10,592 records and helps with identifying the range of the species.

The Sage-grouse Telemetry database contains 2,954 records and is an updated compilation of radio-marking studies or investigations that have occurred or are ongoing in the state. This database contains information on frequency, bird movements, dates and banding information. This database is updated as new information becomes available.

The Brood Survey database is a cumulative dataset of brood surveys conducted for sage-grouse. This database has 5,850 records contained within it and is updated annually.

The estimated project cost for this job was **$8,233.00** for state fiscal year 2008. The actual expenditure for this project was **$11,077.56** which represents an over-expenditure of **$2,844.56**. Much of the over-expenditure is due to the reconstruction of the database to be more compatible with other western states and to allow for more seamless transfer of data.

Local Area Conservation Planning & Implementation

State: Nevada Grant Title: Nevada Sage-grouse Conservation Project

Grant No.: W-64-R-8 Sub-Grant Title: Conservation Planning
Sub-Grant No.: II Project Job Title: Local Area Conservation Plans
Project No.: 3 Job Title: Local Sage-grouse Conservation Planning and Implementation
Job No.: 1

Period Covered: July 1, 2007 – June 30, 2008
Report by: Shawn Espinosa and Curt Baughman

OBJECTIVES

The following objectives were identified in the W-64-R-8 Grant Agreement for this particular job:

- Complete any unfinished population management unit plans, revise existing plans and refine projects identified within those plans; and
- Assist with and/or conduct implementation of suggested projects within completed plans.

The following summaries describe the work accomplished during state fiscal year 2008 including project implementation, population management unit planning and major habitat issues.

Elko County LACP

SUMMARY

In state fiscal year 2008, the Nevada Department of Wildlife partnered with the BLM – Elko District to assist with a meadow restoration project north of Carlin, NV. This project involves controlling noxious weeds on the lower portions of Susie Creek and Dry Gulch in order to restore native wetland vegetation important to many wildlife species including Greater sage-grouse. NDOW's goal for this project is to improve the existing condition of sage-grouse brood rearing habitat within the Susie and Maggie Creek drainages. The objective of this project is to target Scotch thistle, hoary cress and Russian knapweed, treat them with herbicide and reduce them to a level that does not impact native vegetation. Through the W-64 Grant, NDOW obligated **$45,000.00** to this project.

Nevada Department of Wildlife personnel continue to spend a significant amount of time working with the Bureau of Land Management and U.S. Forest Service in attempting to restore some of the many landscapes destroyed by wildfire over the past several years. Acquiring funding and procuring seed continues to be a major task each year. Much of the funding acquired for restoration from NDOW comes from Habitat Conservation Fee, Wildlife Heritage Trust Account, Question 1 and private donations.

Lincoln LACP

SUMMARY

One Lincoln County Technical Review Team for Sage-grouse meeting was held during the work period. This meeting focused on the proposed Mount Wilson/White Rock/Table Mountain utility scale wind energy facility and its affects to sage-grouse and other wildlife associated with these mountain ranges. If constructed as proposed this facility would be comprised of approximately 400 turbines distributed throughout the aforementioned mountain ranges and have miles of new improved roads and transmission lines associated with it. Much of the development would occur in critical sage-grouse and mule deer summer range. If constructed, the impacts to sage-grouse and other wildlife species are thought to be very significant. This issue will be the main focus of this group for an extended period of time.

White Pine LACP

SUMMARY

The White Pine local conservation planning area includes four main PMU groups including the Butte/Buck/White Pine, Schell/Antelope, Spring/Snake Valley and the Steptoe/Cave PMUs. Of these, the Butte/Buck/White Pine PMU group is the largest in terms of area and also harbors the most significant sage-grouse population within the White Pine LACP at 4,429 sage-grouse (2008 minimum spring breeding population estimate). Activities within this planning area continue to be associated with intensive lek monitoring, telemetry studies and agency specific projects, some of which have the potential to directly or indirectly benefit sage-grouse habitats.

In the spring of 2008, a sagebrush habitat restoration project was completed in the Schell/Antelope PMU. The goal of this project was to restore a Wyoming big sage/mixed brush community that had been compromised by the encroachment of Pinyon and Juniper trees. A total of 3,000 acres were chained within a 4,000 acre project area. The area was then aerially and mechanically seeded with native forbs, grasses and shrubs. This project is expected to produce additional winter, nesting and early brood rearing habitat for sage-grouse that breed on the east bench of the northern portion of the Antelope Range. This project represents a partnership between the BLM – Ely District and the Nevada Department of Wildlife. NDOW is contributing $30,000 to this project through the Habitat Conservation Fee program.

An additional restoration project in the Schell/Antelope PMU was continued in FY08. In addition to the 1200 acres that were previously treated, prescribed burning was utilized on approximately 800 acres of Wyoming and Black sage habitat that had become heavily encroached with pinyon and juniper trees. The short term objective of this project was to reduce tree density and improve the amount and diversity of grasses and forbs. Longer term benefits are expected to include an improved shrub component.

In addition to these projects, NDOW staff has been working cooperatively with BLM – Ely District fuels management and wildlife personnel to design and implement several pinyon and juniper removal projects at various locations including the north Antelope Range, Duck Creek Basin (Schell Creek Range) and near Bullwhack Summit (Steptoe Valley/east Egan Range). All of these areas have valuable sage-grouse habitat in terms of breeding habitat, but little is known regarding available nesting or brood rearing habitat. Implementation funding for these projects is being provided by Question 1 bond monies administered by NDOW. In conjunction with these projects, NDOW staff worked with staff of the Great Basin Bird Observatory (GBBO) to apply for a grant from the National Fish and Wildlife Foundation (NFWF) to monitor the response of neo-tropical migrant breeding birds, pinyon jays and sage-grouse to these pinyon and juniper removal projects and the various methods used to implement the

project. Question 1 monies were used as the match for this grant opportunity. The proposal developed by GBBO was accepted by the NFWF and a grant was awarded to them.

Bi-State LACP

SUMMARY

The Bi-State planning area takes in portions of Carson City, Douglas, Lyon, Mineral and Esmeralda Counties in Nevada. The PMUs located in this planning area are the Pine Nut, Desert Creek/Fales, Mount Grant, Bodie Hills, White Mountains and South Mono PMUs. All PMUs cross state boundaries with California except for the South Mono PMU which is completely within California.

The population of sage-grouse residing within this area is a part of what is known as the "Mono Basin" sage-grouse population. This population was petitioned for listing under the Endangered Species Act in 2006 and after a 90-day review process, the U.S. Fish and Wildlife Service issued a finding in December of 2006 that the petition did not present substantial information indicating that listing was warranted. Currently, this sub-population is again being reviewed to determine whether or not listing is warranted.

The Pine Nut PMU sub-group continues to work cooperatively with the Bureau of Land Management, NDOW, and local tribal leaders to implement a 2,225 acre pinyon and juniper removal project in the Mill Canyon area of the Pine Nut Range. The major objective of the project include: 1) create a strategically located fuel-break, 2) reduce the threat of wildfire damage to known sage-grouse habitat and 3) enhance existing sage-grouse habitat. The proposed project would employ the use of a large mechanical vegetation shredder known as a "Bull Hog" to masticate existing trees.

In the Desert Creek/Fales PMU, work was completed on the Sweetwater Summit Pinyon and Juniper Removal project. This project area encompassed 3,200 acres of public lands managed by the U.S. Forest Service and was completed by U.S. Forest Service fire crews. NDOW contributed $50,000 to the implementation phase of this project of which **$28,312.93** were expended in fiscal year 2008. The work has centered on the Sweetwater Flat and Wiley Ditch lek complexes and provides sage-grouse with additional habitats for nesting. The project also protects existing lek sites from further encroachment of pinyon and juniper trees and offers greater protection from wildfire.

A pinyon/juniper removal project has also been identified for the Mount Grant PMU near the China Camp and Aurora lek complexes. Funding for this project has been requested through Nevada Department of Wildlife administered Question 1 monies. Currently, USFS personnel are working on completing NEPA documentation for this project.

North Central LACP

SUMMARY

The North Central planning area encompasses Humboldt, Churchill, and Pershing Counties and contains the largest number of Population Management Units (PMUs) of any planning area at 19. During state fiscal year 2008, two additional PMU plans were completed including the Jackson PMU and the Sonoma PMU plans. Additionally, drafts were completed for 9 other PMU plans that accounted for a total of 12 PMUs. In summary, 7 PMU plans have been completed and 12 are in draft form.

In the Santa Rosa PMU, the Martin Creek and Red Hills fires consumed 10,938 acres of sage-grouse habitat in the summer of 2007. The Red Hills fire (3,100 acres) occurred in low to mid elevation sagebrush habitats with some potential for invasive weed species to establish within the fire perimeter. The Nevada Department of Wildlife (NDOW) assisted the Bureau of Land Management – Winnemucca District with the restoration of this fire by providing

$64,000.00 worth of native plant seed material. This funding was made available through the W-64-R-8 grant (Sage-grouse Conservation).

Also within the Santa Rosa PMU, work has begun on the South Fork Quinn River habitat enhancement project. This project involves restoring approximately 500-1000 acres of cheat grass infested habitat along the river corridor and in upland locations on U.S. Forest Service – Santa Rosa District managed lands. Cheatgrass has become established in many areas along the USFS/BLM boundary following a previous wildfire and treatment with Plateau® herbicide has commenced in order to control cheatgrass. A follow up seeding will be utilized to improve vegetative conditions at the site. NDOW's Habitat Conservation Fee program has contributed $50,000 to this project.

The Lone Willow Roads Herbicide treatment was completed in October of 2007 by the Bureau of Land Management – Winnemucca District (BLM – WFO). This project utilized Spike 20P® sprayed aerially along existing gravel roads in strategic locations to thin dense stands of sagebrush in order to create fuel breaks to slow potential future wildfires. These fuel breaks have been mapped and are available to BLM –WFO fuels management personnel. NDOW contributed $10,147.50 towards the implementation of this project.

Work continues in the Desatoya PMU to implement the Haypress Meadow Restoration Project. A pipe rail fence will be used to exclude livestock and wild horse grazing in order to allow the site to recover. This project encompasses 23 acres and is located in the upper elevations of the Smith Creek watershed. All materials have been purchased for this project with funding being made available through the Nevada Chukar Foundation, Carson Valley Chukar Club and the Nevada Upland Game Stamp program. This project has been delayed due to increasing prices of steel and the need to seek additional funding. The project is expected to be completed in the summer of 2009.

Washoe-Lassen-Modoc LACP

SUMMARY

The Washoe-Lassen-Modoc LACP is made up of six Population Management Units including the Vya, Massacre, Sheldon, Buffalo/Skedaddle, Virginia and Pah-Rah PMUs (a single PMU plan was developed for the Virginia and Pah-Rah PMUs) The Buffalo/Skedaddle and Vya PMUs cross state boundaries and are managed jointly with California.

The Massacre PMU harbors the largest sage-grouse population within this planning area. A majority of the area is public land; however, vital spring sources and small meadows that are important to sage-grouse as brood rearing habitat are mostly privately owned. Many of these spring sources and meadows are in poor condition due to excessive livestock grazing and wild horse use. At least six springs have been identified by the BLM for improvement during the upcoming fiscal year. Recently, just over 17,000 acres of private in-holdings were transferred to public ownership through the Southern Nevada Public Lands Management Act. Many parcels were within federally designated Wilderness Study Areas and almost all contain a water source. The BLM and the Nevada Land Conservancy have been working with the landowners since 2003 for federal acquisition of the land in order to protect the wide variety of resources on the property. The acquisition was very complex with just over 100 distinct parcels with appurtenant water rights involving three different BLM jurisdictions. These parcels are scattered throughout both the Massacre and Buffalo/Skedaddle PMUs (Nevada portion).

The second largest population within the planning area is in the Buffalo/Skedaddle PMU. The California portion of this planning area is considered the core population of sage-grouse in the northern part of California. The Bureau of Land Management conducted hand removal (chainsaw) of juniper trees across approximately 100 acres in the Coppersmith Hills located in the northern portion of this PMU. In addition to these efforts, negotiations continue regarding a

conservation easement for the Shinn Ranch property located within 10 miles of the Nevada border in California. This area is the most critical brood rearing habitat in northern California.

Ongoing juniper treatments are being implemented by the BLM – Surprise Valley in the Vya PMU. Approximately 175 acres have been thinned around the Stateline lek with an additional 85 acres cut within the vicinity of Barrel Springs which is considered late brood rearing habitat for sage-grouse. In addition to these activities, the BLM is also working on a re-route of a proposed fence in the vicinity of the Toney lek to avoid collisions.

The Nevada Department of Wildlife recently discovered a lek (2007) in the Virginia PMU and verified the location in 2008. This lek, in addition to the existing known upper elevation lek and the numbers of males attending these leks gives credence to the long term sustainability of this population. However, there are many threats that loom on the horizon for this population in the form of a proposed community development and possible wind energy project(s). These factors, along with a recently constructed transmission line within two miles of the newly discovered lek, have led to concern over this population. In order to learn more about this population, NDOW personnel developed a proposal to radio mark up to 29 individual sage-grouse and monitor their movement over a 12 to 18 month period. This proposal was submitted to the Wildlife Heritage Trust account subcommittee and was funded for $30,000. In addition, further funding was provided by the Carson Valley Chukar Club and the Nevada Chukar Foundation in the amount of $11,125. These funds are being provided to the USGS through interlocal agreement to conduct follow up and vegetative monitoring.

South Central LACP

SUMMARY

The South Central Local Conservation Planning area consists of Eureka, Lander and Nye Counties. There are 10 PMUs within this planning area and most are very remote. The South Central local working group has continued with the implementation of recommendations and projects outlined in both the Fish Creek PMU and Battle Mountain PMU planning documents.

The Nevada Department of Wildlife (NDOW) partnered with the Bureau of Land Management – Mt. Lewis Field Office and the University of Nevada Cooperative Extension (UNCE) in 2008 to implement a project to restore sage-grouse habitat in the Roberts Creek Mountains within the Three Bar PMU located in Eureka County. The major objective of this project is to improve the existing condition of sage-grouse nesting and brood rearing habitat within the Willow Creek drainage on the north end of the Roberts Creek Mountains by removing encroaching pinyon and juniper trees within mountain sagebrush and shrub communities. Other objectives of the project include reducing pinyon and juniper tree densities within this watershed to prevent a closed canopy of trees in the future. Reducing tree densities will also enhance stream flow in Willow Creek and improve groundwater recharge of springs in the immediate area. The total project area is 2,000 acres. Through this grant, NDOW currently has a contract in place with the UNCE – "Bootstraps" program providing **$46,851.84** worth of funding through the end of 2009. A total of **$11,763.76** was expended on this project in state fiscal year 2008.

Members of the South Central Planning Group worked to expand the project area during 2008 and prepared an Environmental Assessment to complete this work. An additional 1,000 acres are proposed for similar treatment in the upper Vinini Creek area located on the east side of the Roberts Creek Mountains. This area is very important nesting and brood rearing habitat for sage-grouse as suggested from results of the Falcon to Gonder Transmission Line Study being conducted by the University of Nevada, Reno. The long-term integrity of the sagebrush community is being compromised by pinyon and juniper here as well. NDOW is considering further funding provisions to help implement the extended portion of the project.

Expenditures

The original amount identified within the original W-64-R-8 Grant Agreement to complete Local Area Conservation Planning and Implementation was $238,400. The actual expenditure for projects, plan development and revision and labor was $160,977.47 for a surplus of 77,422.53. However, several problems arose because this portion of the grant was being matched with State of Nevada – General Fund monies. The State of Nevada experienced a budget shortfall in fiscal year 2008 due to various reasons. This caused the Nevada Department of Wildlife to use Question 1 (NDOW bond funds) monies as a match and to carry out identified projects. In the end, $67,101.30 of Question 1 funds and $93,876.17 were expended on this particular job in fiscal year 2008. Additional funds would have been expended on certain projects, but limited operating periods and crew availability often cause projects to extend into the next fiscal year. It is recommended that surpluses associated with this job be utilized to cover over-expenditures within this sub-grant including the following:

- $5,207.89 for Governor's Statewide Strategic Planning and the Sage and Columbian Sharp-tailed grouse Technical Committee; and
- $2,844.56 for Database Management.

RESEARCH

Habitat Relationships

State: Nevada Grant Title: Nevada Sage-grouse Conservation Project

Grant No.: W-64-R-8 Sub-Grant Title: Research
Sub-Grant No.: III Project Job Title: Habitat Relationships
Project No.: 1 Job Title: Sage-grouse Habitat Relationships
Job No.: 1

Period Covered: July 1, 2007 - June 30, 2008

Report by: Shawn Espinosa

SUMMARY

This job was inactive for the work period. No projected expenditures were identified for this project; however, there may be future opportunities for research on sage-grouse habitat relationship so this project name and number will remain as a placeholder.

Mortality Relationships

Harvest Impacts: Eureka County

State:	Nevada	Grant Title:	Nevada Sage-grouse Conservation Project
Grant No.:	W-64-R-8	Sub-Grant Title:	Research
Sub-Grant No.:	III	Project Name:	Mortality Relationships
Project No.:	2	Job Title:	Harvest Impacts
Job No.:	1		
Period Covered:	July 1, 2007 – June 30, 2008		
Report by:	Mike Podborny		

OBJECTIVES

The objective for this particular job is to better determine harvest rates for certain areas distributed across Nevada to ensure that they are within acceptable levels according to WAFWA guidelines. These efforts will also help determine better population estimate parameters.

SUMMARY

This project is being conducted in conjunction with the Falcon to Gonder Transmission Line Study. The University of Nevada, Reno (UNR) is researching the effects of this transmission line on the sage-grouse population in Eureka County and conducts capture and marking efforts in the spring and fall of each year. NDOW assists UNR with the capture of sage-grouse in the fall of each year. All birds are marked with leg bands and a proportion is radio-marked with VHF telemetry devices. This opportunity lends itself to a fairly simple mark-recapture effort with regard to determining a population estimate for this area, mainly because of the fall hunting season.

In the fall of 2007, a total of 16 sage-grouse were radio-marked with VHF telemetry devices. These birds consisted of 12 “new” females made up of 4 adults, 4 yearlings, and 4 young of the year as well as 2 male young of the year, and 2 young of the year whose sex was unknown.

The number of bands actually recovered from hunters in addition to actual re-sighting has allowed for the estimation of the male segment of the population (see table 7 below).

Year	Male Population Estimate	Standard Error	Adult Male Harvest	% of Adult Males Harvested
2003	401	73	36	9.0%
2004	348	46	29	8.3%
2005	438	60	24	5.5%
2006	454	66	36	7.9%
2007	414	74	41	9.9%

Table 7. Annual estimates of the male population of sage-grouse within the Falcon to Gonder Transmission Line Study area.

A total of **$6,872.06** was expended in state fiscal year 2008 assisting UNR with the capture of sage-grouse during fall capture efforts. The total amount identified in the W-64-R-8 Sage-grouse Conservation Project for this and the Transmission Line Impacts research was **$54,000.00**. The total expended for both of these projects was **$58,034.92** representing an over-expenditure of $4,034.92 or 7.5%.

Transmission Line Impacts

State: Nevada Grant Title: Nevada Sage-grouse Conservation Project

Grant No.: W-64-R-8 Sub-Grant Title: Research
Sub-Grant No.: III Project Name: Mortality Relationships
Project No.: 2 Job Title: Transmission Line Impacts
Job No.: 2

Period Covered: July 1, 2007 - June 30, 2008

Report by: Mike Atamian and Jim Sedinger, Department of Environmental Sciences, University of Nevada, Reno

SUMMARY

This research project is a long-term (10-year) study on the effects of a large scale (345 kV) transmission line on the sage-grouse population within the "zone of influence" of that line (Eureka County). The Nevada Department of Wildlife is a contributor and partner on this project and has had a contract in place with the University of Nevada, Reno since 2004 to conduct this particular research. Per this contract, NDOW is contributing $50,000.00 annually up to $250,000. Fiscal year 2008 represents the final year of this obligation. Other partners on the project including the Bureau of Land Management and Nevada Energy will be providing the majority of the necessary remaining funding to complete the research. During 2008, the total expenditures relating to this project amounted to **$51,162.86**. The estimated amount identified in the W-64-R-8 grant to complete this project and the Harvest Impact project above was **$54,000.00**. Below is an updated abstract regarding the preliminary findings of this research.

ABSTRACT

To characterize demographic processes in Greater Sage-grouse (*Centrocercus urophasianus*), we monitored 12 lek sites in a ~6500 km^2 area in Eureka County, Nevada. The long-term goal of this ten-year study is to assess the impact of Sierra Pacific Power Company's Falcon-Gonder transmission line on sage grouse demography and population dynamics. We used mark-recapture, lek observations, nest & brood monitoring, vegetation sampling, and radio telemetry to estimate key demographic parameters. A total of 850 sage grouse (663 male, 174 female, & 13 unknown sex young of the year) have been banded during the first five years of the study. Program MARK known fate data type was used to estimate an annual female survival of 0.554 (± 0.029 SE) for adults, 0.584 (± 0.030) for juveniles, and 0.518 (± 0.028) for young of the year. Nests were monitored to estimate success, with nest site vegetation characteristics measured after hatch and evaluated as covariates in a nest success analysis in Program MARK. The best model contained the effects percent shrub cover on the 10 m transects (PSC), percent cover in the nest meter^2 (NMT), and distance to the lek of capture (DLC). All three effects were positively related to daily nest survival. Based on a 38 day nesting period and mean PSC, NMT, and DLS nest success was estimated as 0.196 (± 0.016 SE). The overall primary sex ratio and individual brood primary sex ratio appear to be 1:1 in our population. Common Raven counts have increased by ~200% along the transmission line corridor and in lek disturbance events. We detected an overall decline in the sage grouse population in our study area this year. This decline may be due to West Nile Virus, environmental factors, or a combination of both. We will intensify our monitoring next year to determine if the 2007 decline was a stochastic event or the beginning of a trend, and to identify the probable causes of a population decline.

COORDINATION

State: Nevada Grant Title: Nevada Sage-grouse Conservation Project

Grant No.: W-64-R-8 Sub-Grant Title: Coordination
Sub-Grant No.: IV Project Job Title: Project Coordination
Project No.: 1 & 2 Job Title: Intra & Inter-agency Coordination

Period Covered: July 1, 2007 – June 30, 2008

Report by: Shawn Espinosa

OBJECTIVES

The objective of this particular job is to ensure consistent monitoring efforts and to keep personnel abreast of pertinent planning and implementation efforts by coordinating within and amongst state and federal agencies.

SUMMARY

Inter and Intra-agency coordination continues to be an integral part of this overall project considering the fact that sage-grouse mainly inhabit federally administered public lands within Nevada (80%). Statewide coordination meetings are held annually with the Bureau of Land Management and US Forest Service to discuss projects, management techniques and National Environmental Policy Act documentation necessary to conduct certain projects. In addition to these coordination efforts, annual meetings are held within the Game Division to discuss management issues related to sage-grouse.

In State Fiscal Year 2008, **$12,989.72** was expended in regional and staff level coordination efforts. This figure represents the cumulative total of inter-agency and intra-agency coordination. The W-64-R-8 Grant Agreement identified a total of **$10,000.00** available for coordination during state fiscal year 2008. The 2008 expenditure represents an over-expenditure of $2,989.72.

ADMINISTRATION

OBJECTIVES

This project provides oversight regarding personnel assignments, proper tracking of time spent on projects identified within the W-64-R-8 Grant Agreement and administrative issues regarding the development and implementation of contracts or agreements.

SUMMARY

The “administration” portion of this grant covers miscellaneous costs associated with timesheet development and tracking, annual and biennial budget development, cost accounting and developing federal assistance documents. The administrative costs for this project amounted to **$11,518.94** in state fiscal year 2008. The original budget identified in the W-64-R-8 Grant Agreement was **$12,000.00**.