

EFFECTIVENESS OF SHARP-TAILED GROUSE TRANSPLANTS IN THE TOBACCO VALLEY, MONTANA

D. Lewis Young, U.S. Forest Service (Retired), 68 Garrison Drive, Eureka, MT 59917

Alan K. Wood, Montana Fish, Wildlife & Parks, 490 North Meridian Road, Kalispell, MT 59901

ABSTRACT

Records extending back to 1861 document the presence of sharp-tailed grouse (*Tympanuchus phasianellus*) in the Tobacco Valley of northwestern Montana. However, following a similar trend throughout the species' range, populations of sharp-tailed grouse in the Tobacco Valley declined sharply until only three males were observed on one lek by 1987. Seven years of transplanting birds (1987 to 1997) increased the numbers of individuals on one lek and led to the establishment of a second lek that persisted for three years. After each of the transplant periods ended, the number of males counted at leks gradually declined until the last lek activity was recorded in 2000. Sharp-tailed grouse in the Tobacco Valley likely were extirpated by 2003.

Key Words: Columbian sharp-tailed grouse, *Tympanuchus phasianellus columbianus*, Tobacco Valley Montana, population augmentation, extirpation.

INTRODUCTION

In Montana, the Columbian subspecies of sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) occurs west of the Continental Divide (Connally et al. 1998). This subspecies has experienced a 90% decline in historically occupied habitat (Miller and Graul 1980, U.S. Fish and Wildlife Service 2000), and was identified as a highest priority species in need of management in Montana's Comprehensive Fish and Wildlife Conservation Strategy (Montana Fish, Wildlife & Parks 2005).

The first written record of sharp-tailed grouse in the Tobacco Valley in northwestern Montana appeared in the journals of members of the British Boundary Commission charged with surveying the 49th parallel after it was established as the boundary between Canada and the United States. John Keast Lord, Assistant Naturalist and Veterinary Surgeon for the British Boundary Commission in 1861, reported the sharp-tailed grouse to be "particularly abundant on the tobacco plains near the Kootanie River" near present day Eureka (Thompson 1985). In 1866 Lord authored a book that contained perhaps the first detailed, accurate description of leks and the spring mating rituals as well as illustrations

of the sharp-tailed grouse in Montana (Lord 1866).

Subsequent reports of sharp-tailed grouse continued to document the species presence in western Montana. Siloway (1901) reported that sharp-tailed grouse occupied grasslands west of the Continental Divide in Montana. Saunders (1921:58) stated that sharp-tails were a "fairly common permanent resident of the mountain valleys, formerly very common but becoming rarer each year." However, by 1969, sharp-tails were confined to small areas in the Kootenai, Flathead, and Blackfoot river valleys (Hand 1969). The last reported sighting on the Flathead Indian Reservation was in the late 1970s (Brett Gullet, personal communication) until May 2008 when Dwight Bergeron of Montana Fish, Wildlife & Parks observed a single bird in the Camas Prairie Basin (Dwight Bergeron, personal communication). The last documented sighting in the Flathead Valley was made during an Audubon Christmas Bird Count in 1980 (Leo Keane, personal communication). In the Blackfoot Valley, a total of 14-16 birds were documented on two leks in the mid-1990's (Deeble 1996), but by April 1999, only five males were observed on the two leks (D. Lewis Young, personal observation).

The first recorded lek survey was conducted in 1960 by the Montana Fish and Game Department, now called Montana Fish, Wildlife & Parks (Manley and Wood 1990). Then from 1966-1974, Montana Fish and Game conducted irregular surveys on the leks in Sections 11 and 26. From 1976-1980, professor Chuck Jonkel and students from the University of Montana conducted surveys in the valley. From 1979 until present, the lek surveys have been conducted by a combination of people and agencies and organizations including Montana Fish, Wildlife & Parks, Montana Natural Heritage Program, The Nature Conservancy, Kootenai National Forest, and private individuals. The senior author has counted the leks annually beginning in 1987.

In the Tobacco Valley of northwestern Montana, declining lek counts in the 1970s and 1980s led to efforts to sustain or increase the Tobacco Valley population through transplants. This decision was based on observations that most attempts to reestablish extirpated populations failed (Toepfer et al. 1990). The purpose of this paper is to summarize those transplant efforts and evaluate their effectiveness.

STUDY AREA

The Tobacco Valley is located in northwestern Montana near the town of Eureka (48.945° North, -115.076° East, Figure 1). The Kootenai River drains the valley which is surrounded by the Salish Mountains to the west and south and the



Figure 1. Location of the Tobacco Valley in Northwestern Montana along with three different areas used as the source of transplanted sharp-tailed grouse; Sand Creek Wildlife Management Area, ID, Clinton, BC, and Douglas Lake, BC.

Galton Range and Whitefish Range to the east. Vegetation in the valley floor was historically dominated by bunchgrass communities resulting from limited precipitation caused by a rain shadow effect from the surrounding mountains and recurring fires from both lightning starts and cultural use by the native Ktunaxa First Nation people. Average annual precipitation in the valley is 37 cm. Low temperatures in January average -9.1°C and high temperatures peak in July at 29.4°C (Western Regional Climate Center 2011). The geography of the valley is dominated by drumlins and kettles formed by glacial action (Coffin et al. 1971).

Bown (1980) reported six leks in the Tobacco Valley prior to the initiation of this transplant effort. However, only five of those six locations were mapped, and historic lek count data were available from only three of the mapped locations. Another lek was discovered in 1991 bringing the total number of leks with data to four (Figure 2).

METHODS

Source of Transplanted Birds

Two areas in British Columbia, Canada, and one in Idaho (Figure 1) were the sources for transplanted sharp-tailed grouse. All birds transplanted to the Tobacco Valley

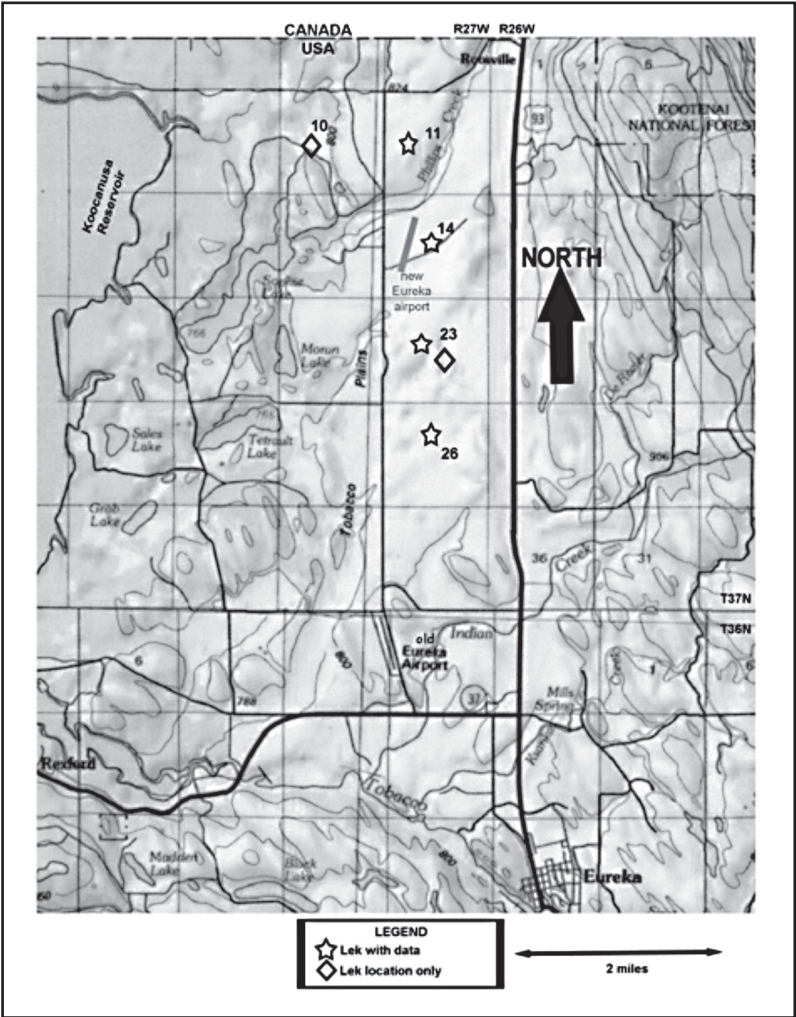


Figure 2. Documented lek locations in the Tobacco Valley, Montana 1960-2000.

were Columbian sharp-tails from three areas of distinctly different habitat types. From 1987-1991, 64 transplanted birds (50 males, 14 females) came from Douglas Lake, B. C., Canada (Figure 1). Douglas Lake is primarily an area of rolling grasslands with habitat very similar to the floor and foothills of the Tobacco Valley.

In 1991, two males and four females were transplanted from the Sand Creek Wildlife Management Area in southeast Idaho (Figure 1) where the dominate habitat was sagebrush.

In 1996-1997, 52 males and 17 females were transplanted from near Clinton, B.C., Canada, (Figure 1) where the habitat was recently-clearcut lodgepole pine forests with interspersed wet meadows. The clearcuts were very large, measuring tens or hundreds of square kilometers for individual cutting blocks.

Transplant Techniques

Initially drop nets were deployed over the lek to capture grouse to be transplanted. Although drop nets proved very successful, they also required considerable equipment and time to set up. Subsequent trapping efforts involved walk-in traps deployed in either the wing trap or circle trap configuration (Toepfer et al. 1988),

depending on the size of the lek and the topographical features.

A total of 139 birds (Table 1) were captured in the spring then transported to the Tobacco Valley and released on the Section 26 lek. The first two years, 1987 and 1988, all captured birds were flown in small aircraft directly to the Eureka airport. In 1989, the first group of captured birds were flown directly to Eureka and the second group was flown to an airstrip near Elko, B.C., about 32 km north of the international border, then transferred to vehicles for the trip into the U.S. Beginning in 1990, all captured birds were transported on the ground in vehicles (a total of 780 km from Douglas Lake and 825 km from Clinton to the Tobacco Valley release site). Multiple trips were made as needed to insure that transplanted birds were released less than two days after capture. Captured birds were placed individually in one of four compartments in divided cardboard boxes with adequate ventilation. Water was initially provided to birds during transport, but was later discontinued because there was no evidence that any birds consumed any water during transport. Only one mortality occurred during transport during the seven years of transplants.

Table 1. Numbers, dates, and sources of sharp-tailed grouse released on the Section 26 lek, Tobacco Valley, Montana, 1987-1997.

Year	Sex		Total	Radio Marked	Source	Survival
	Male	Female				
1987	14	0	14			
1988	18	0	18			47% for 1 year
1989	4	9	13		Douglas Lake, B.C.	after transplants
1990	11	5	16	7M 5F	Lake, B.C.	for several cohorts
1991	3	0	3			
1991	2	4	6	2M 4F	Idaho	0% after 30 days
1996	19	6	25	4M 5F	.	10.5% and 6% for 1 year
1997	33	11	44	9F	Clinton, B.C	after transplants
Total	104	35	139			

Before release all birds were leg banded with numbered plastic leg bands that were also colored coded by sex and year. Forty birds received radios in order to monitor their locations and survival after release. The radio transmitters were made by Holohil Systems Ltd, Ontario, Canada, weighed approximately 11 grams, and were a necklace style attached by an elasticized small-diameter cord around the neck. Birds were then placed in custom built release boxes. Each box had six compartments and a sliding door that covered all compartments. Each compartment measured 20x20x33 cm and had several holes for ventilation. A string was attached to the sliding door and led to a tent 5-10 m away that was used as a blind. The string was slowly pulled to open one compartment at a time (Figure 3).

Evening was the preferred time to release birds because newly released birds would not have time to move very far before dark, thus giving them more time to settle down after the transport and release. All but three releases were done in the evening between sundown and dark. Birds were placed in the release boxes near the lek less than one hour before sundown. If possible, releases were made after local birds appeared on the lek. Birds were released one at a time so that each bird's actions could be observed.

To provide an auditory signal to newly released birds that the release site was an active lek, a continuous loop recording of sharp-tail vocalizations was played on a battery-powered stereo system with external weather-proof speakers. A timer was set to play the recording for approximately 1.5 hours beginning just before daylight in the morning and again for approximately one hour just before dark in the evening. The recorded sharp-tail vocalizations were played from the time of the first transplant of the season until the end of the normal lek attendance even if there were males attending the lek and displaying. In 1996, only one male appeared on the lek in early spring and he had disappeared before the transplants began, so eight silhouette sharp-tail decoys were deployed in an attempt to add a visual signal to the newly transplanted birds.

After each transplant, multiple visits were made to the lek to observe and record numbers of birds at the lek. Attempts were made to observe leg band colors, but color was often difficult to determine for many of the birds due to the height of grass on the lek. When radio-marked birds were present, a Telonics receiver and hand-held H-antenna were used to obtain locations and confirm the identity of each bird.

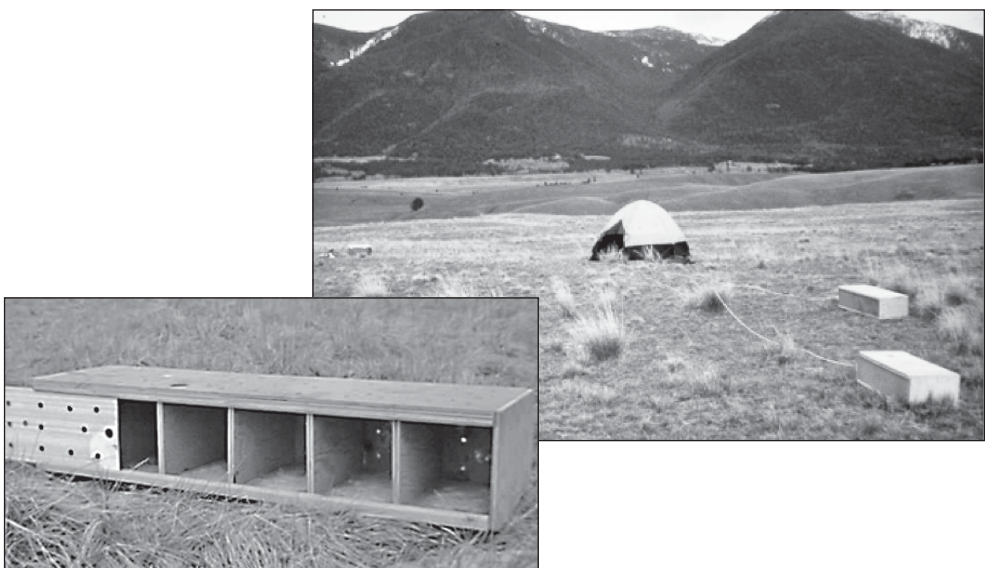


Figure 3. Release box and arrangement with tent blind on the Section 26 lek.

Lek Surveys

Leks were surveyed an unknown number of times per year from 1960-1986. During that period, except 1979-1980, observers would typically make a brief observation of the lek noting the number of birds observed, and then would flush birds to make a more accurate count. If females were present they were included in the total count of flushed birds. The lek count recorded for each year was the highest number of birds seen on the lek at one time (males and females combined). During 1979-1980 and 1987-2010, the reported lek count for each year was the highest number of males seen at one time based on multiple visits (approximately 5-15). In those years that transplants took place, the reported lek counts are the highest number of males observed on the leks before transplants took place. Numbers of individuals observed on a lek after a transplant was often considerably higher than before a transplant.

RESULTS AND DISCUSSION

The number of individuals on leks increased from an initial count of 14 birds in 1960 to a peak of 54 total birds on all leks in 1971, and subsequently decreased to the

last observation of two males observed in spring 2000 (Figure 4). Numbers of birds on the Section 26 lek increased after both the 1987-1991 and 1996-1997 transplants. A new lek was also documented in Section 14, five years after the initial 1987 transplant and about 2.5 km north of the Section 26 lek (Figure 2). Not only did the transplanted birds attend the leks the same year of transplant, many survived one or more years and continued to attend the leks. After the first two years of transplants, the number of males on the Section 26 lek increased from three to 8-10 and maintained that level for six years, including three years after the first series of transplants ceased in 1991. During that same time period, the new Section 14 lek was active with a peak of 12 males in 1991, the year it was discovered.

Use of the Section 14 lek began decreasing in 1992, one year after the first series of transplants stopped, and this lek was unoccupied three years post-transplant. Observations of some marked birds on the Section 14 lek, which were originally released on the Section 26 lek, suggested that the Section 14 lek was indeed a new site that may have been established by surplus birds resulting from the first series

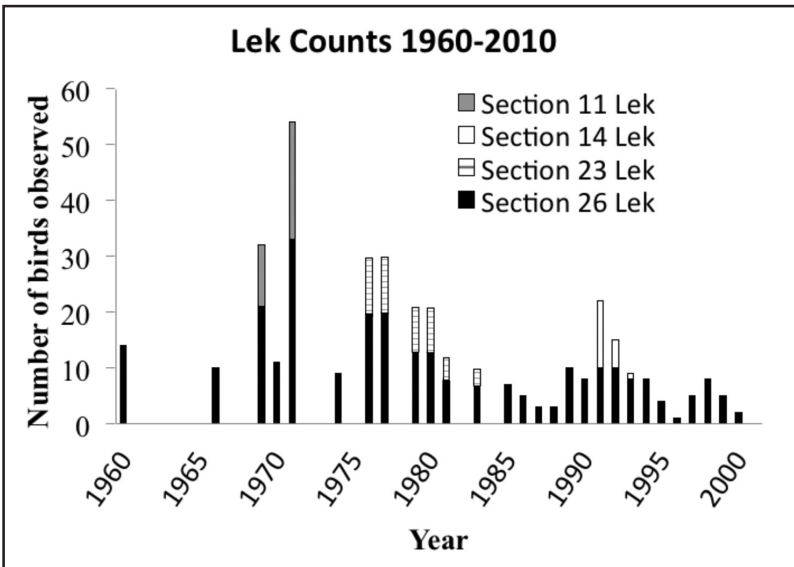


Figure 4. Counts of sharp-tailed grouse observed on four leks in the Tobacco Valley, Montana, 1960-2000. Surveys were conducted but no birds have been observed since 2000.

of transplants. The fact that the number of birds at the Section 26 lek remained relatively stable while the Section 14 lek was declining, then attendance at the Section 26 lek continued to decline at about the same pace until the next series of transplants caused another temporary increase in lek use also suggests that the Section 14 lek was established as a result of new birds being added to the valley and either moving to a new lek or displacing some resident birds to create a new lek.

The second series of transplants (1996-1997) resulted in a trend similar to that on the leks in Sections 14 and 26 in the first series of transplants, but the increase of males on the lek was smaller with the birds from Clinton, B.C. After the last transplant in 1997, the numbers peaked in 1998, then began to decline. The last lek activity in the Tobacco Valley was recorded in 2000 (two males). Note that the transplanted birds in 1996-1997 came from clear-cut lodgepole pine habitat and not grasslands like those from the 1987-1991 transplants. This habitat difference may help explain the poorer response observed in the second series of transplants.

Differential rates of survival were observed based on the source of birds (Table 1). Transplanted birds from Douglas Lake experienced 47% survival one year after transplant for several of the transplanted cohorts (Cope 1992). All six birds from southeast Idaho were radio-marked and none survived longer than 30 days (D. Lewis Young personal observation). Survival of birds from Clinton, B.C. was much lower than the Douglas Lake, B.C. birds. Of the 19 males released in 1996, a maximum of two (10.5%) were observed on the lek in 1997 and none in 1998. Of the 33 males released in 1997 a maximum of two (6%) were observed in 1998 and one in 1999 (D. Lewis Young personal observation).

CONCLUSIONS

These data suggest that the two series of transplants may have maintained sharp-tails

in the Tobacco Valley for about 12-13 years longer than had no transplants occurred. It is likely that, with only three males on the Section 26 lek in 1987, it would have disappeared by 1988 or 1989. Sharp-tailed grouse populations seemed to respond favorably following each transplant, but after each of the transplant periods ended, the lek numbers gradually declined until the last lek activity was recorded in 2000. Some sharp-tails may have persisted in the Tobacco Valley, but the population was likely extirpated by 2003 since no sharp-tailed grouse sightings have been confirmed in the valley from 2003 through 2012. Many factors may have influenced sharp-tail habitat and populations in the Tobacco Valley (Manley and Wood 1990); but ultimately, efforts to sustain the species by supplementing the population through transplants were unable to overcome whatever factors ultimately led to the extirpation of this population.

ACKNOWLEDGMENTS

The authors thank the many people who have contributed their efforts and knowledge to the conservation and management of sharp-tailed grouse in the Tobacco Valley and contributed in various ways to this paper including: T.Thier, M. Wood, D. Genter, B. Hall, T. Manley, D. Jury, J. Williams, H. Nyberg, D. Bergeron, J. Roberts, R. Kerr, J. Marks, V. Saab, A. Dueker, L. Young, R. Komac, M. Cope, B. Eng, L. Howke, J. Cross, G. Heinz, C. Ferruzzi, M. Pearson, and L. Johnson.

LITERATURE CITED

- Bown, R. R. 1980. The status of Columbian sharp-tailed grouse on the Tobacco Plains, Eureka, Montana. Senior thesis. University of Montana, Missoula. 42 pp.
- Connelly, J.W., M.W. Gratson, and K.P. Reese. 1998. Sharp-tailed Grouse (*Tympanuchus phasianellus*). In A. Poole and F. Gill, eds. The Birds of North America. No. 354. The Birds of North America, Inc., Philadelphia, Pennsylvania. 20 pp.

- Coffin, D. L., A. Brietkrietz, and R. G. McMurtrey. 1971. Surficial geology and water resources of the tobacco and upper Stillwater river valleys, northwestern Montana. Montana Bureau of Mines and Geology Bulletin No. 81. Montana College of Mineral Science and Technology, Butte. 48 pp.
- Cope, M.G. 1992. Distribution, habitat selection and survival of transplanted Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) in the Tobacco Valley, Montana. Master's Thesis, Montana State University, Bozeman. 60 pp.
- Deeble, B. 1996. Conservation of Columbian Sharp-Tailed Grouse with Special Emphasis on the Upper Blackfoot Valley, Montana. M.S. Thesis, University of Montana. 70 pp.
- Hand, R. L. 1969. A distributional checklist of the birds of western Montana. Unpublished Report, University of Montana, Missoula. 51 pp.
- Lord, J. K. 1866. The Naturalist in Vancouver Island and British Columbia. Spottiswoode and Company, London. 358 pp.
- Manley, T. and M. Wood 1990. The status of Columbian Sharp-tailed Grouse on the Tobacco Plains, Eureka, Montana. Unpublished Report. Montana Dept. Fish, Wildlife & Parks, Kalispell, Montana. 25 pp plus appendices.
- Miller, G.C., and W.D. Graul. 1980. Status of sharp-tailed grouse in North America. Pages 18-28 in P.A. Vohs and F.L. Knopf, eds. Proceedings of the Prairie Grouse Symposium. Oklahoma State University, Stillwater.
- Montana Fish, Wildlife & Parks. 2005. Montana's Comprehensive Fish and Wildlife Conservation Strategy. Montana Fish, Wildlife & Parks, 1420 East Sixth Avenue, Helena, MT 658 pp.
- Saunders, A. A. 1921. A distributional list of the birds of Montana. Pacific Coast Avifauna No. 14. Cooper Ornithological Club, Berkeley, CA. 194 pp.
- Siloway, P.M. 1901. Summer birds of Flathead Lake. Bulletin of the University of Montana. Bulletin #1, Biol. Series #1. 83 pp.
- Thompson, L. S. 1985. Montana's Explorers: The Pioneer Naturalists. Montana Geographic Series Number 9. Montana Magazine. 109 pp.
- Toepfer, J. E., J. A. Newell, and J. Monarch. 1988. A method for trapping prairie grouse hens on display grounds. Pages 21-23 in A. J. Bjugstad, ed. Prairie-chickens on the Sheyenne Grasslands. U. S. Department of Agriculture, Forest Service General Technical Report RM-159.
- Toepfer, J.E., R.L. Eng, and R.K. Anderson. 1990. Translocating prairie grouse: What have we learned? Trans. 55th N.A. Wildl. & Nat. Res. Conf. pp. 569-579.
- U.S. Fish and Wildlife Service. 2000. Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition to List the Columbian Sharp-tailed Grouse as Threatened. Federal Register, Vol 65, No 197. pp. 60391-60396.
- Western Regional Climate Center. 2011. Montana Climate Summaries, Eureka Ranger Station, Montana (242827), 6/1/1960 to 12/31/2005. <http://www.wrcc.dri.edu/summary/climsmmt.html>

Received March 26, 2012

Accepted September 6, 2012