

End-of-Summer Field Research Update: 2014 Impacts of Transmission Line Construction on Sage- Grouse in Southern Utah

Erica P. Hansen, MS Research Assistant



Photo: E. Hansen

Summer fieldwork has just wrapped-up on our sage-grouse research in the Bald Hills. Although data collection is still ongoing (thanks to GPS transmitters!) we have concluded our trail camera observations of vehicles and counts of avian predators for this field season. In this document, I detail some highlights from the summer and summarize the current status of the project.

INITIAL RESEARCH GOALS

This project was designed to investigate the impact of the Sigurd-Red Butte (SRB) 345 kV transmission line on sage-grouse in the Bald Hills of southern Utah. This new structure is of particular concern because it passes within 4 miles (6.44 km) of an active lek, violating a buffer distance suggested by the US Fish and Wildlife Service (USFWS, 2003) and the Bureau of Land Management (BLM). It has been proposed that introducing new tall structures into sagebrush (*Artemisia* spp.) landscapes may increase perching

opportunities for avian predators, increase vehicular traffic, provide movement corridors for terrestrial predators, and fragment sage-grouse habitat (Connelly et al 2004, Messmer et al 2013). However, there have been few studies designed specifically to evaluate these impacts on sage-grouse. Our research proposed to collect detailed spatial data to assess sage-grouse habitat use both before and after construction. This data will be coupled with two metrics for quantifying associated disturbance on the landscape: vehicular traffic and avian predator presence.

FIELD DATA COLLECTION PROCEDURES AND RESULTS

GPS Transmitters

We obtained 20 Global Positioning System (GPS)-style solar transmitters to allow us to collect movement data on the birds for two years. We divided the transmitters evenly between two lek locations within the Bald Hills to serve as control (Mud Springs) and impact (Little Horse Valley) sites. Transmitters were deployed in the spring of 2014. We receive 4 locations per bird, per day from these transmitters, enabling us to collect detailed spatial data year-round.



Figure 1: Location of the Bald Hills SGMA

Erica Hansen, MS Research Assistant, Utah State University.

I can be reached at ericaphansen1@gmail.com with additional questions



Photo: S. Graham

We initially deployed transmitters on 20 birds. We hoped to collect data from 5 males and 5 hens at each lek site. However, hens were scarce at the Mud Springs lek, and we were unable to locate any for our study. This resulted in n=10 males at Mud Springs and n=5 males, n=5 hens at Little Horse Valley. Two mortalities occurred prior to the end of lekking season, enabling us to re-deploy those transmitters before the birds moved to summer habitat (bringing our total birds included into the study to 22).

Since the birds have moved away from the leks, we have had 5 additional mortalities (most occurred during the spring migration, and all appeared to be predation-related). We are planning to re-deploy those units this fall.

Avian Point Counts

To measure associated disturbance caused by the SRB transmission line, I conducted point counts for avian predators throughout the study period at both the control and impact sites (see Fig. 2, above). We hypothesize that densities of avian predators will increase in areas near the transmission line due to the addition of new perching substrate. Avian surveys consisted of fixed-radius (750m) point counts on linear transects. At each site (control and impact) I surveyed a roughly E-W transect across the diameter of the lek buffer, as well as a N-S transect along a linear region of anthropogenic disturbance. At Mud Springs, this feature was the SRB transmission line right-of-way (ROW), while at Little Horse Valley I selected the Minersville 2-lane highway.

Avian Survey Locations

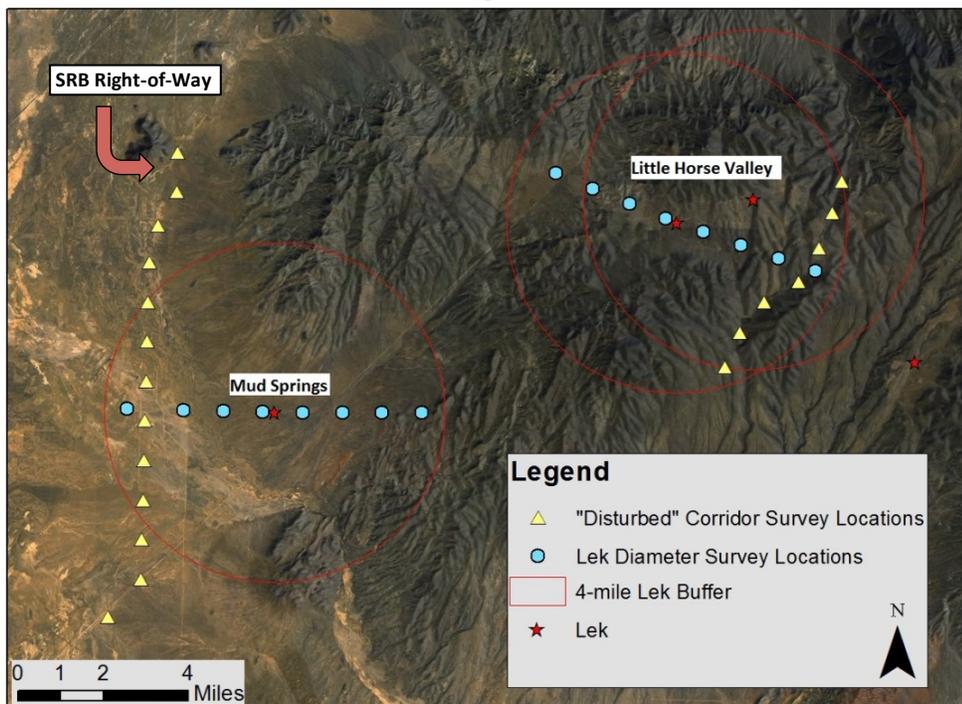


Figure 2:

Avian Survey locations at Mud Springs and Little Horse Valley. Surveys were conducted for raptors and corvids within 750m of each fixed survey location from April-August. Total, 10 lek diameter surveys and 16 “Disturbed Corridor” surveys were conducted over the course of the summer. 10 trail cameras were also placed at equal intervals along the SRB right-of-way.

Erica Hansen, MS Research Assistant, Utah State University.

I can be reached at ericaphansen1@gmail.com with additional questions

Trail Cameras

In addition to conducting surveys for avian predators, we positioned 10 trail cameras at regular intervals along the portion of the ROW that passes through the Bald Hills SGMA. These will allow us to quantify changes in vehicular traffic as the road is developed. The Bald Hills SGMA is located on Bureau of Land Management (BLM) Land, so we hypothesize that frequencies of both project-related and recreational vehicular traffic will increase upon the installation of the transmission line access road. This summer, we detected only project-related traffic this summer because the road has not yet been fully developed.



Bushnell

06-25-2014 09:46:12

Photo: E. Hansen

These cameras also allowed us to capture images of predators using the ROW as a travel corridor. Although this data will not be included in analysis, it provides additional information about factors impacting sage-grouse in the area.



Bushnell

06-27-2014 22:28:26

Photo: E. Hansen



Photo: E. Hansen

POINTS OF INTEREST

Several events of particular interest have occurred since the initiation of our project. These will be highlighted briefly here; however I am happy to provide additional information upon request.

Successful Nesting

All 5 of the hens included in our study were “young-of-the-year”, meaning that this spring was their first year of breeding. Of the 5, we had one predation-related mortality, and one successful nest. The nest was located very close to the hen’s capture lek (Little Horse Valley). It appears that she laid 5 eggs and successfully hatched 3. Although we were not able to visually confirm the survival of her brood, she remained in the area adjacent to her nest for 42 days after hatching before moving to summer habitat in the Minersville agricultural fields. This amount of time is appropriate for a hen to remain in brood-rearing areas prior to migrating to late brood-rearing/summer habitat with her young.

Dispersal Event

During the second part of the summer, we observed an irregular movement pattern in one of our male grouse (Transmitter # 133958). He was originally captured at the Mud Springs lek, near the SRB transmission line. Throughout the early summer, he moved across the Bald Hills, eventually stopping at the Poorman Flat lek complex on the eastern side of the SGMA. On July 4th, he left the Poorman Flat area, crossed Interstate 15 near the town of Beaver, and moved into a high elevation area near Shelly Baldy Peak to the northwest. He remained in this high-altitude (generally over 3300m) area until August 6th, when he left and returned to Poorman Flat. The Euclidian distance from the capture lek to the furthest point recorded is over 80 km.



Photo: E. Hansen

The area he occupied during the month he was outside the SGMA was a high alpine environment, characterized by mainly grasses and forbs, as well as some conifers and shrubs. There was no sagebrush present (see above image). The map below shows his journey, color-coded by month.

Bird 133958 Locations 4/4/14-8/12/14 : DRAFT

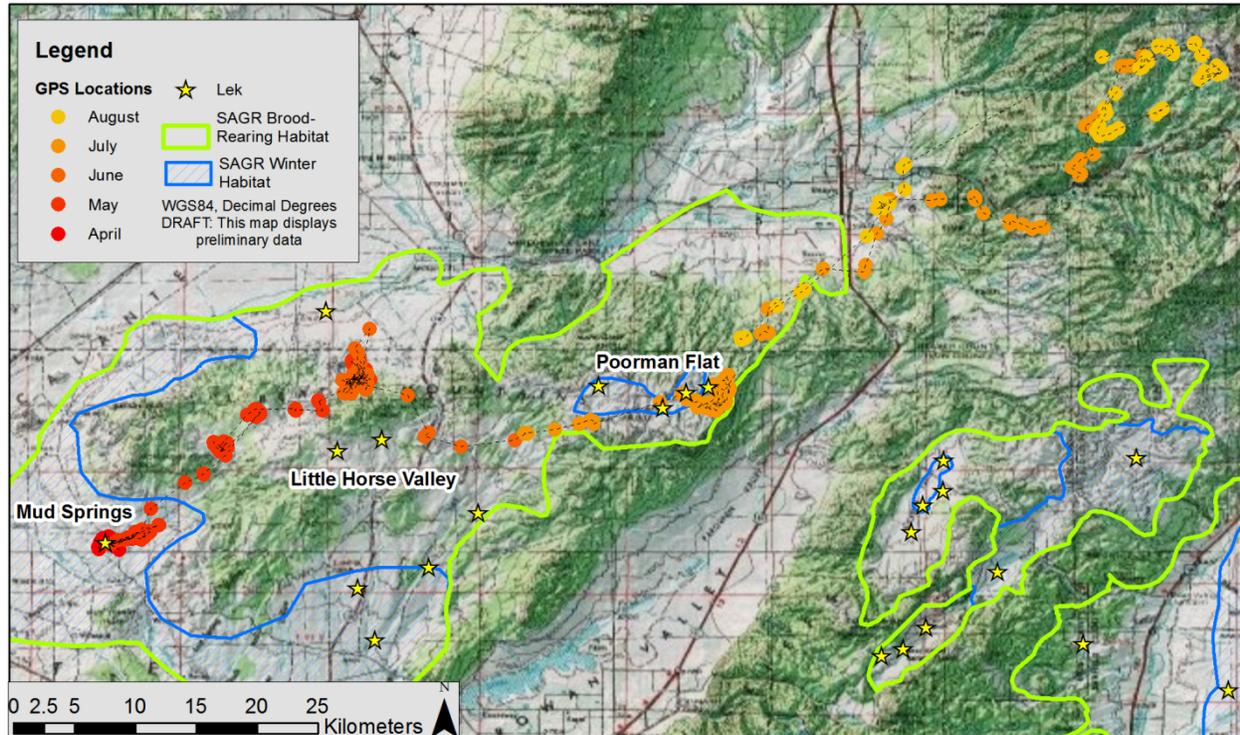


Figure 3: Location data collected for bird #133958 from his capture on 04/04/14 through 08/12/2014

POTENTIAL AREAS FOR FURTHER INVESTIGATION

Perch Deterrent Effectiveness

Rocky Mountain Power will be fitting transmission line towers located inside the Mud Springs lek buffer with avian perch deterrents. Since I will be collecting data about perching events and general point counts for avian predators along the transmission line ROW, this may allow us to evaluate the efficacy of the selected deterrents. Construction began within the lek buffer on 8/4/2014, so a majority of the data collected this summer can be used as a “before” comparison when evaluating changes in perching frequency.

Sage-Grouse Use of Historically Burned Habitat

The Bald Hills region has historically undergone repeated burns from both natural and human-triggered wildfires. Burnett (2013) showed that Bald-Hills sage-grouse were more likely to utilize areas that had undergone fuel treatments or had burned in the last 20 years than those that had not. Our location data collected to this point appears (anecdotally) to support this hypothesis and may allow us to further investigate this trend.

REFERENCES

Burnett, A. C. 2013. Modeling habitat use of a fringe greater sage-grouse population at multiple spatial scales. Thesis. Utah State University, Logan, Utah, USA.

Connelly, J.W., S.T. Knick, M.A. Schroeder, and S.J. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming.

Messmer, T. A., R. Hasenyager, J. Burruss, and S. Liguori. 2013. Stakeholder contemporary knowledge needs regarding the potential effects of tall structures on sage-grouse. *Human Wildlife Interactions*. 7:273-298.

United States Fish and Wildlife Service (USFWS). 2003. Interim guidelines to avoid and minimize wildlife impacts from wind turbines. Washington, D.C. USA. <<http://www.fws.gov/r9dhcbfa/windenergy.htm>> Accessed December 15, 2013.

THANKS!

Major Advisor:
Dr. Shandra Nicole Frey

Committee Members:
Dr. Terry Messmer and Dr. Joe Wheaton

