Greater Sage-grouse Responses to Pinyon - Juniper Removal

West Box Elder Sage-Grouse Field Report – April/May 2019

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Background and Purpose

We are documenting greater sage-grouse habitat-use, seasonal movement, and vital rate data relative to pinyon-juniper (conifer) removal projects within the Park Valley area of the Box Elder Sage-grouse Management Area (SGMA). The purpose of the research is to develop a tool that can be used to better predict sage-grouse use and survival relative to the placement of conifer removal projects. We hope that this tool will be used as part of the Utah Department of Natural Resources Compensatory Mitigation Program to enhance mitigation credits accrual for participating landowners. This is our fourth field season.

Currently, we have deployed 12 global positioning system (GPS) rump-mounted transmitters on female sage-grouse. Five GPS females were marked during the 2019 field season, which will be detailed in the mortality section below. With the GPS transmitters, data downloads are being gathered every 4 hours on a 24 hour cycle throughout the study period. Most of the GPS transmitters are additionally equipped with a small VHF antenna to aid in recovery of transmitters in the advent they default or left upside down after a mortality occurs.

The transmitters have been deployed on females captured near conifer treatment areas. The location data collected from transmitters will help us refine conifer removal strategies and placement, and also allow us to develop a tool for managers to use to optimize sage-grouse response to management actions within the SGMA. This larger data set will allow us to research and observe more closely sage-grouse utilization of treatment areas in reflection to overall population fitness at the landscape level. Additionally, we have deployed 15 very high frequency (VHF) necklace-style radio-collars across the study area and to determine if vital rates may differ by type of radio transmitter. Both units weigh about as much as two silver dollars – 22 grams.

As done in the 2018 field season, we are marking sage-grouse chicks this season with small VHF backpacks. These VHF backpacks will be sutured onto the chick's backs and will remain until around the 70 day mark. This will allow us to track the complete life cycle of sage-grouse within the West Box Elder SGMA and obtain the finest scale data possible to observe how individual sage-grouse chicks are responding to pinyon-juniper treatments across the SGMA.

Study Area

The study area is part of the Raft River subunit and was based on the Box Elder Management Area outlined in the 2002 state plan, and is embedded in the Box Elder Sage-grouse Management Area defined in the Utah Plan (2013). The Raft River subunit is located in the northwestern portion of Utah. Geographically, the core of the study area is flanked by the Raft River Range Mountains to the north, the Grouse Creek and Pilot Mountains to the west, by the Great Salt Lake to the southeast and areas of salt flats to the south. Approximately 440,750 ha are encompassed within the study area. Land ownership within the Raft River subunit is a mixture of public and private lands consisting of: Bureau of Land Management, U.S. Forest Service, Utah School and Institutional Trust Lands Administration and private.

Technicians

For the 2019 field season, two technicians were hired: Patrick Savarino and Eddie Conrad. Patrick comes from Texas and Eddie from Iowa. Both of them have worked previously on sage-grouse projects and their acquired skills were evident from the first day. They have proven to be capable and knowledgeable field technicians. Eddie will be covering the Dry Basin to Meadow Springs and part of Warms Springs and Patrick will also cover part of Warms Springs to Rosette and the Park Valley area. I (Justin) will cover everything outside of their study areas and will help with locating hard to find birds and vegetation surveys. We provide this information if you should encounter one of the technicians and wonder what the heck they are doing.

Both technicians came with telemetry experience but were still given a training refresher before turned out into individual study areas. Telemetry training up front helps to prevent struggling in the field and learning on the fly; and unnecessary flushing sage-grouse while performing weekly locations. Vegetation identification training also has begun, and will continue throughout the field season when assistance is required.

We also use a rigorous operational protocol for trucks and ATVs for safety purposes and to prevent unnecessary damage to equipment. All technicians are trained on how to properly use 4wd vehicles in field conditions. Also included is a full day on ATV field safety and maintenance. In a controlled field situation, the technicians are trained on the following: loading and unloading, hill ascending and descending, rollover angles, approach angles, maneuverability and proper gear selection and speed. The old saying “an ounce of prevention is worth more than a pound of cure” we believe also applies when teaching field technicians to be safe while operating ATVs in rough, remote field conditions.

Equipment

For the 2019 field season, five existing mortality recovered GPS transmitters were refurnished and 15 new VHF collars were purchased. Any mortality recovered GPS transmitters will be sent back to the manufacturer to be refurbished due to their multiple season field durations and prevent field malfunctions once re-deployed. The refurnished GPS transmitters and VHF collars will be distributed evenly across the study area or where they are needed to augment the existing

radio-marked sage-grouse population. No new equipment was purchased for the 2019 field season. However, any non-functioning equipment throughout the field season will either be properly repaired or replaced.

Lekking and Breeding Status

For this study season, we monitored and counted 18 unique leks for the UDWR lek count survey across the study area. Each lek was counted at least 3 times for the lekking season. Lekking season has concluded for the 2019 field season.

Trapping

Sage-grouse trapping for the 2019 field season was more efficient than the 2018 field season. Even though male lek attendance appeared to be lower, there were still plenty of females in and around the lek sites. Furthermore, both technicians were extremely skilled trappers; simply put—they could flat catch birds and almost did not miss catchable females! We marked 21 sage-grouse females in just over 2 weeks. We concluded trapping on the morning of April 18.

Nesting and Brooding

Currently, about 60% (both GPS and VHF birds) are nesting, with a few remaining females initiating nests. To date, three nests have been predated and 1 abandoned across the study area. One definitely showed all the signs of ravens, with holes being pecked in all eggs. The other nest remained undetermined with no eggs being present. None of the females were killed during nest predations. The reason for the one abandoned nest was undetermined. As like was done in previous seasons, to mitigate the potential for ravens using our activities to key in on nesting sage-grouse, we are being careful not to spend extended periods observing nesting females. This caution is warranted because we have observed ravens following us on several different occasions this season while relocating females; whether they were actual profiling us or just being curious- we are playing it safe.

Nesting occurred earlier for the 2019 field season than the 2018 field season (April 17 vs. April 23). With the increased snow at higher elevations, females are selecting nesting sites at mid to lower elevations this season. Areas were females selected nesting sites last season higher on the mountain are still under snow; however, those areas should be great brooding habitat. The first female to nest this season occurred on April 17. She selected a nest site south of Park Valley out on the Rudy Pipeline reclamation area. We currently have 14 females nesting across the study area.

Currently, we have 3 brooding females (2 VHF and 1 GPS) on the Rudy Pipeline reclamation area. To date, no brooding females have lost their brood. Several more females should hatch this week and next week.

Chicks

We currently have radio marked 2 broods with small VHF backspacks. As mentioned beforehand, these backpacks are sutured on with sterile monofilament line, not unlike fishing line. We had one GPS female's uploads fail within a few days from hatching, thus not allowing us to mark her brood. Her GPS uploads are currently working again. We will continue marking all broods until nesting season has ended.

Mortality

For the 2019 field season, only 1 VHF female has been predated to date. This is an 88% decrease from last year's mortalities at this point. The VHF female killed showed signs of avian predation; there was a golden eagle present on carcass when the technician located it and she was a fresh kill. A noticeable reduction in ravens has been witnessed during our corvid surveys around nest sites this season. Why this reduction has occurred, we are not sure, but we will take it.

Grouse Movements

With having increased wet areas and runoff for the 2019 field season, birds are really spreading-out over the landscape now that the lekking season has concluded and females are nesting. Females are remaining lower on the slope this season, with females on the Rudy Pipeline reclamation area initiating nests the earliest. Currently, one GPS female is nesting in Sickle Springs area southwest of Dry Basin, at least 9 females (VHF) are nesting in Warms Springs / Black Hills areas. Two VHF and 2 GPS females are nesting north of Park Valley. Of the females we radio-marked, we have located all of them except one that went missing last week. I anticipate will find her this week.

One GPS female that was captured in early April 2018 in Dry Basin, split her breeding season between Dry Basin Lek and Coyote Hills Lek that was dissected by Highway 30. This season she only attended the Coyote Hills Lek south of the pipeline and did not travel west across Highway 30 to the Dry Basin Lek (Figure 1). She initiated a nest south of the pipeline scar by Coyote Hill but her nest was predated the first week of May. In addition, 1 GPS female that we marked this season in Dry Basin moved north after capture almost to Warm Springs and then crossed over onto the west side of the Grouse Creeks—a fairly large movement (Figure 2). We can see the exact route she used and movement patterns throughout upslope migration. This information would simply not have been possible with VHF collared birds. Very cool movement data to look

at and capture! This type of data is what we want to capture to better understand sage-grouse movements across broad landscapes and interactions with pinyon-juniper treatment areas in the Box Elder SGMA. Below are two images from Movebank of the two GPS females movement location data. As you can tell by the point densities of < 10, they have not been staying put in one location very long. Note: the red plus signs (+) within the images are the initial capture locations.

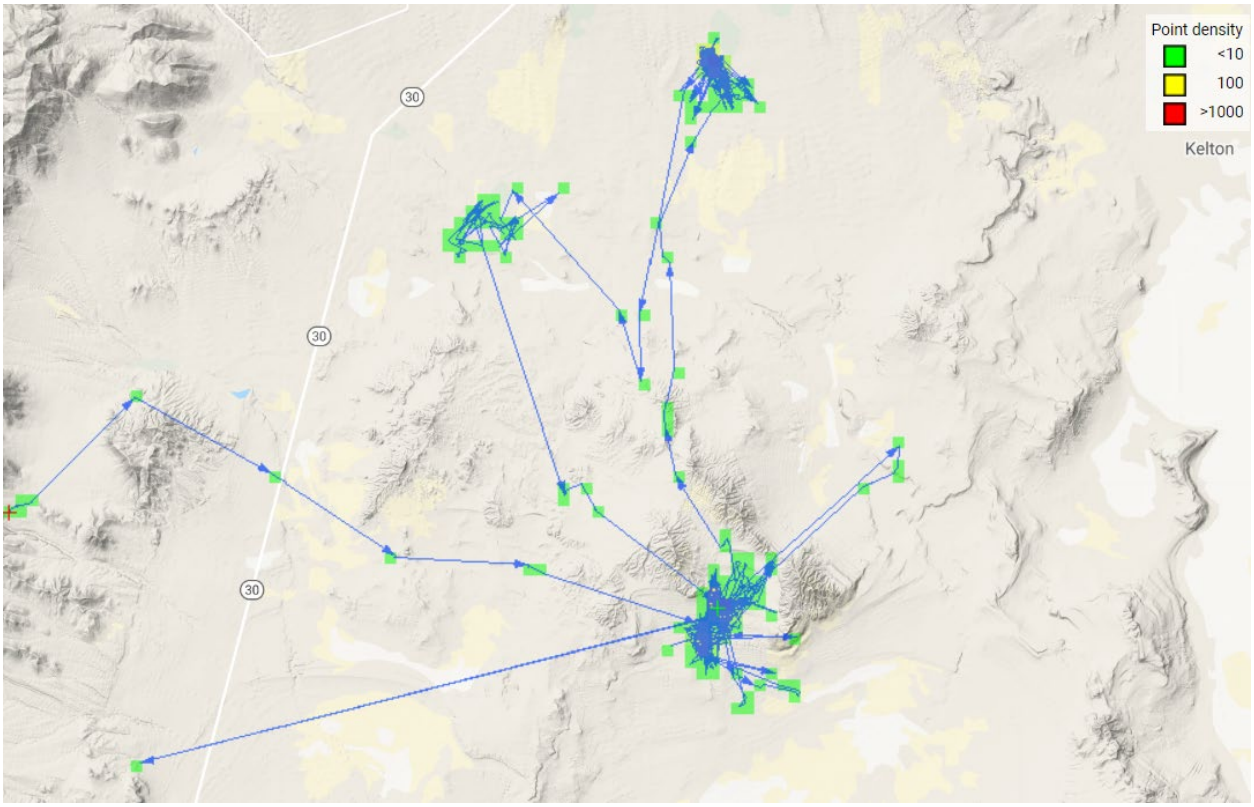

Figure 1. GPS marked female movements from Dry Basin across Highway 30.

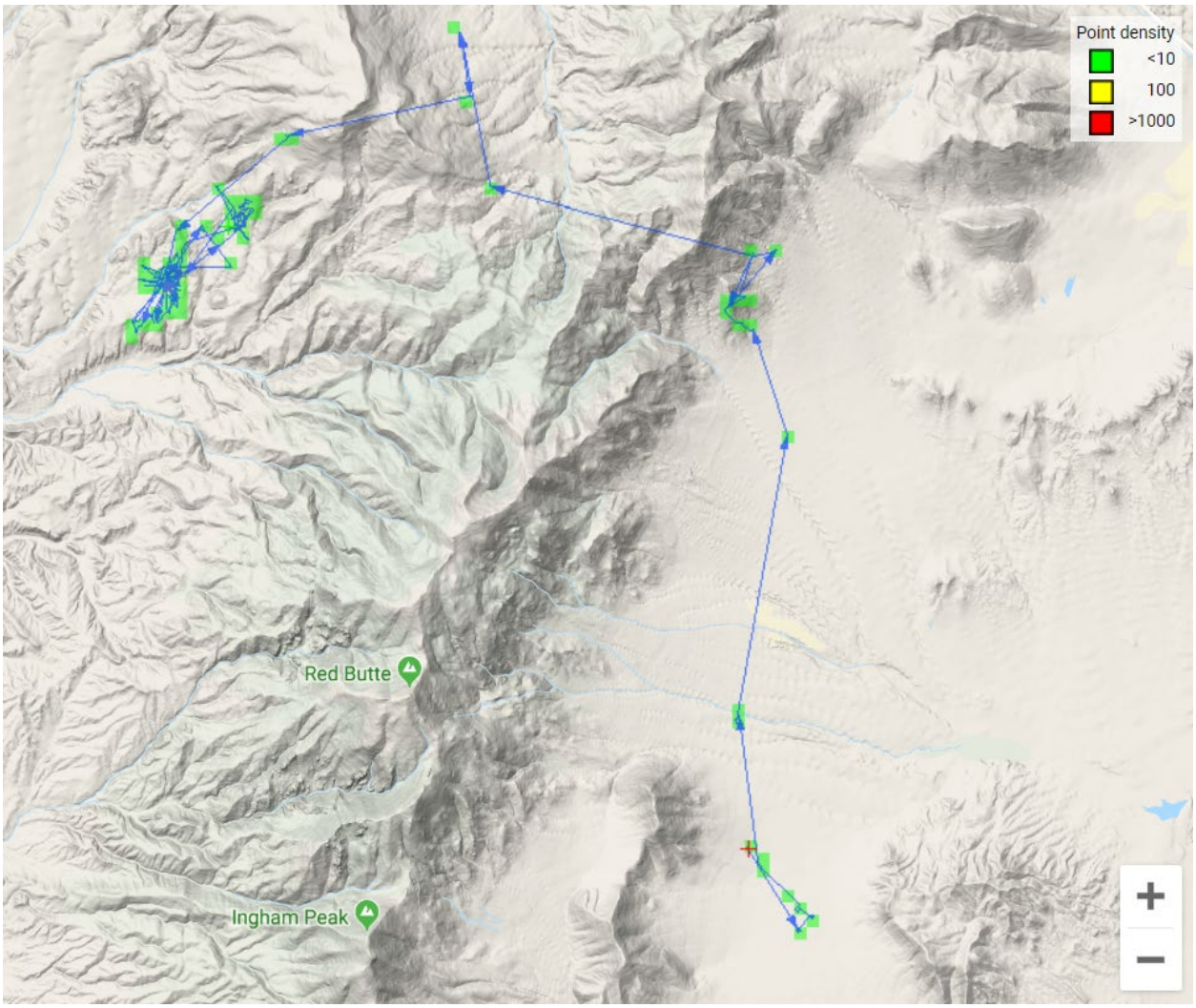

Figure 2. GPS marked female movements from Dry Basin Lek capture point in early April 2019.

West Box Elder Landowners

We are very appreciative for the amount of cooperation, interest and trust that has been given to my technicians and I for the past three field seasons and for the 2019 field season as well; be reassured, it is not taken lightly. We are aware that we are guests and my technicians are reminded frequently of the privilege we have. Furthermore, I have really enjoyed getting to know all the different landowners within my study area and learning about their knowledge of the landscape, both past and present.

Without hesitation, please contact us if you want to know anything about what we are observing on your property, or if you just have general questions. If we do not have the answer, we will do our best to find it out for you.