

Rich County Sage-Grouse Field Report – Final Field Report – August 2021

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Background and Purpose

This is the July/August 2021 field report for the research project studying greater sage-grouse (*Centrocercus urophasianus*; sage-grouse) responses to livestock grazing in Rich County, Utah. Livestock grazing occurs on over 80% of the current sage-grouse range. The U.S. Fish and Wildlife Service has stated that, in general, livestock grazing does not constitute a range wide species conservation threat. Given that livestock grazing is a predominate land-use in the sagebrush (*Artemisia* spp.) ecosystem, it has the potential to directly affect sage-grouse habitat quality. Our working hypothesis is that sagebrush rangelands managed using site-specific and adaptive rotational grazing practices can facilitate grass and forb production, creating a green wave that can benefit sage-grouse in terms of increased nesting and brood success. To test this relationship, we are studying radio-marked sage-grouse movements, vital rates, habitat selection and brood success, as well as sampling vegetation from both grazed and ungrazed pastures across the study area to follow growth/regrowth in those pastures.

We are documenting changes in plant phenology with the use of the Normalized Difference Vegetation Index (NDVI). The NDVI is a satellite-derived index of the photosynthetic biomass, or ‘greenness’, of an area. We will be using these data to track the green-up across the landscape, and rate change between the different grazing methods on our two study areas, as well as within each area between grazed and rested pastures. Public land stakeholders, sage-grouse, and other sagebrush species will benefit from research defining the direct link between sage-grouse and grazing management, as well as how grazing may influence a continual green-wave through their movements similar to other herbivore migrations.

Study Area

We are conducting our research in Rich County, located in northeastern Utah. This research is a continuation of a long-term study started in 2012. The study area includes the southwestern portion of the Wyoming Basin Sage-grouse Management Zone II, and is comprised of two research areas, Desert Land and Livestock (DLL) and the Three Creeks Allotment (3C). The DLL is a 200,000 acre privately-owned ranch, of which 160,000 acres are privately-owned and 40,000 acres Bureau of Land Management land grazed under a federal grazing allotment. The DLL has maintained rotational prescribed grazing practices since 1979 as well as implemented sagebrush treatments throughout lower elevation pastures. The 3C is a 146,000 acre consolidation of 29 individual BLM and USFS (U.S. Forest Service) grazing allotments and private lands. The 3C consolidation has begun to implement prescribed rotational grazing management.

Brooding

Across both study areas we monitored 12 broods. On 3C we were monitoring two broods, both failing before they reached 5 weeks post-hatch. Figure 2 depicts movements of brooding females from time of

hatch to brood fail on 3C. On DLL we were monitoring 10 broods, three which made it to their 50-day post-hatch brood check. One female had two chicks survive, while the other two each had four chicks. Figure 3 shows movements of brooding females on DLL from time of hatch to either brood fail or to their 50-day brood check.

Table 1. Female greater sage-grouse nest initiation and hatching rates across the study area for the 2021 season, Rich County, Utah.

	Nests Initiated	Nesting Rate	Nests Hatched	Hatching Rate	Successful Broods	Brood Success Rate
DLL	17	77.2%	10	58.8%	3	30%
3C	8	47.7%	2	25%	0	0%
Off Site	4	66.6%	2	50%	1	50%
Total	29	38.7%	14	48.2%	4	29%

Movements

Non-brooding grouse that were outfitted with either a global position system (GPS) radio transmitter backpack or a necklace-style very high frequency radio transmitter were also tracked throughout the season at least once per week. Six GPS marked sage-grouse moved off the study areas. From DLL, one bird went east to Wyoming, two south of I-80, and one north to west of Woodruff. From 3C, one bird went north to the east side of Bear Lake, while two more went south, and are now west of Woodruff.

Mortalities

On DLL were recovered 6 mortalities. On 3C we recovered 7 mortalities. Off- site there were five mortalities. Mortalities include those that occurred over winter from 2020 to 2021.

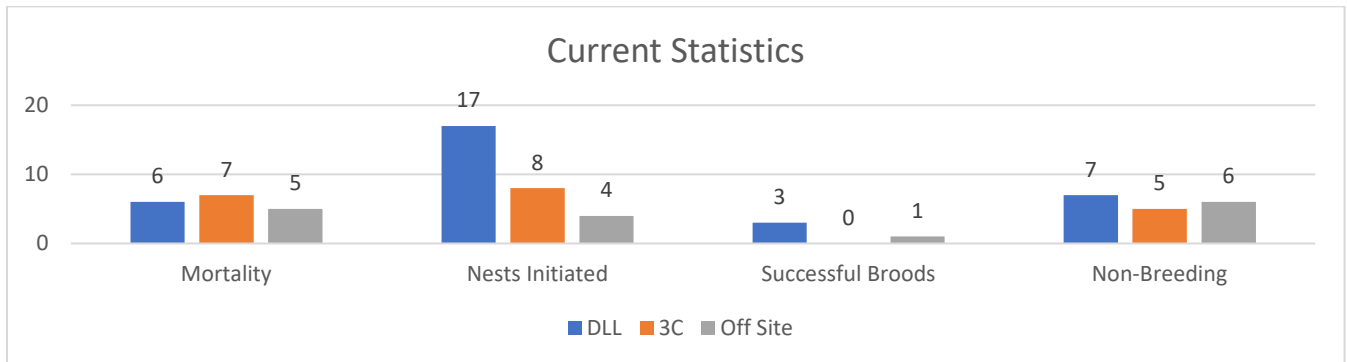


Figure 1. Graph showing the current status of female sage-grouse monitored in Rich County, 2021

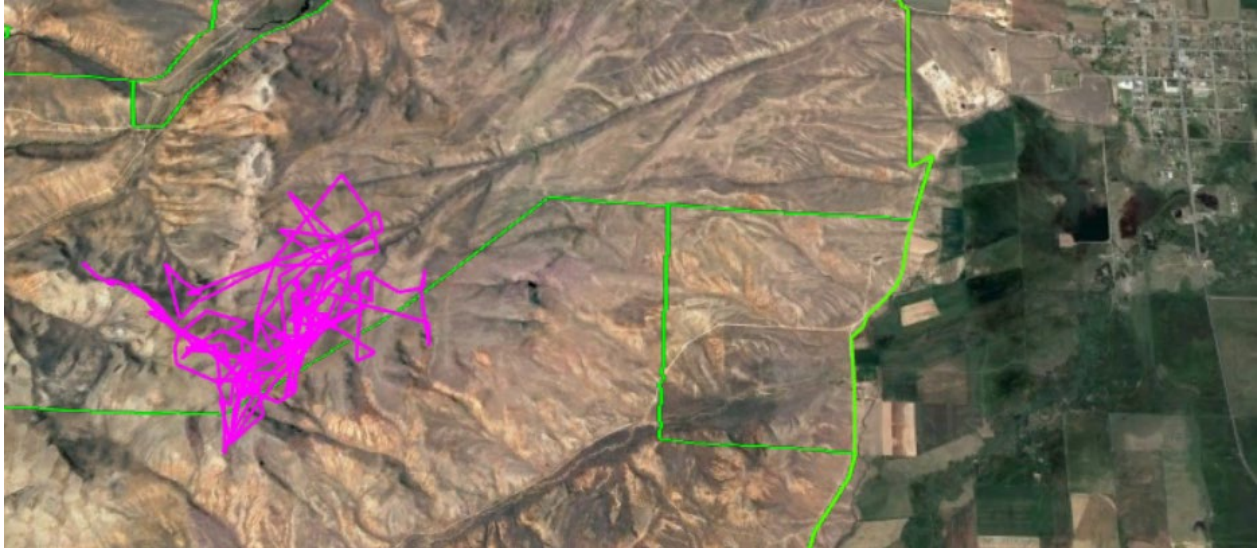


Figure 2. Pink line follows one female grouse with her brood for one month before her brood failed. She was in the Spring Creek lek area just west of Randolph.

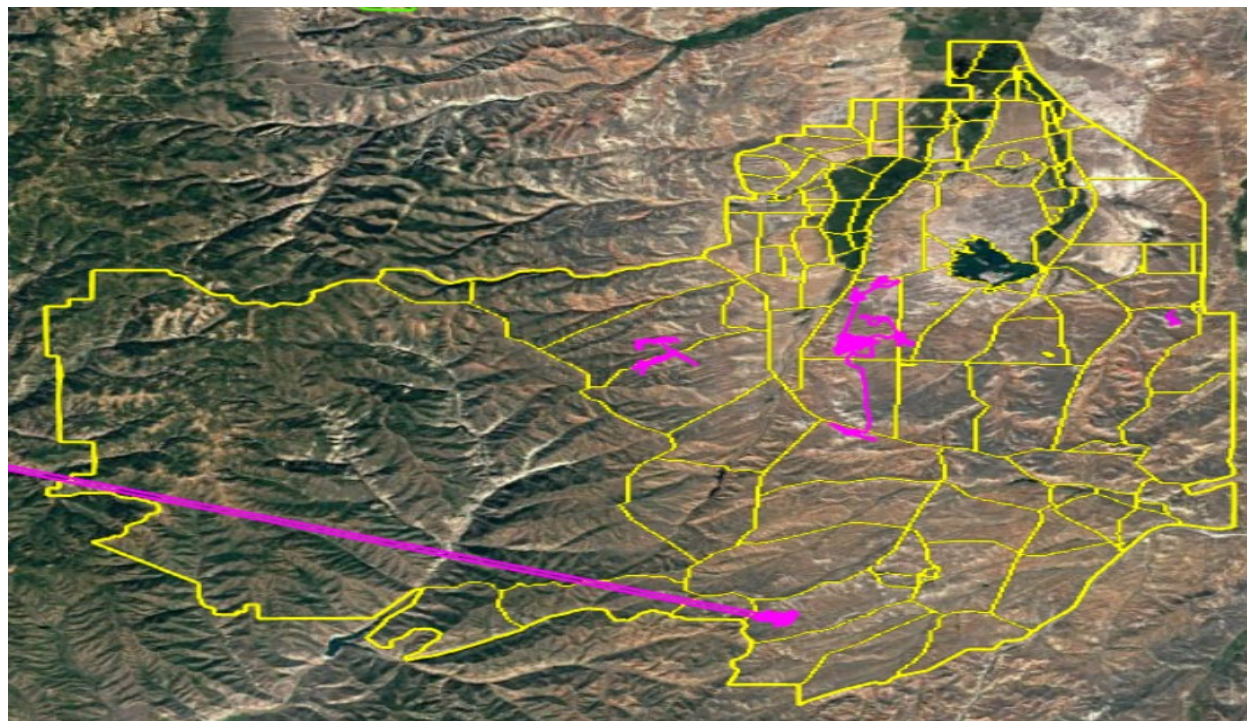


Figure 3. Pink lines follow four female sage grouse and their broods from time of hatch until their brood fails or until their 50-day brood hatch. These grouse were outfitted with GPS harnesses, and include some outlier points, including the pink lines that go off the map to the west (left side).