David Little Livestock Range Management Endowment

AT THE UNIVERSITY OF IDAHO

2011 Project Progress Report:

Dynamics of grazed and ungrazed slickspot peppergrass populations on the Snake River Plain

By Stephen C. Bunting

PRELIMINARY RESULTS:

Sampling occurred during the period of June 1 to June 12, 2011. Data collected on the slickspots included: number of slickspot peppergrass (*Lepidium papilliferum*) plants and evidence of cattle trampling (percentage of slickspot covered by animal hoof prints). Up to 25 slickspots were sampled at each site. However, 2011 was a relatively poor year for *Lepidium* and at some sites only a few occupied slickspots were found. It is hoped that additional occupied slickspots can be located at these sites in 2012.

Fifteen *Lepidium* sites were sampled during June 2011. Five sites are located within cattle exclosures (Holding Pen Seeded, Holding Pen Native, Airbase, Three Creek and Juniper Butte). All exclosures except Juniper Butte were a part of a previous study and have been sampled annually since 2003. Sampling began in June 2010 for the Holding Pen Grazed and South Clover Sites and those sites were resampled in 2011. Nine new sites were added in the 2011 season (1 exclosure and 8 grazed sites).

Examinations in 2010 and 2011 reveal an overall greater number of flowering and total *Lepidium* plants per slickspot occur on grazed compared to ungrazed locations (Figure 1).

The mean number of flowering and total *Lepidium* plants per slickspot at each site is provided in Table 1. All slickspots sampled have a history of known Lepidium *papilliferum* occupancy. However, many of these did not have actively growing plants in 2011. The average number of plants is provided for the occupied slickspots.

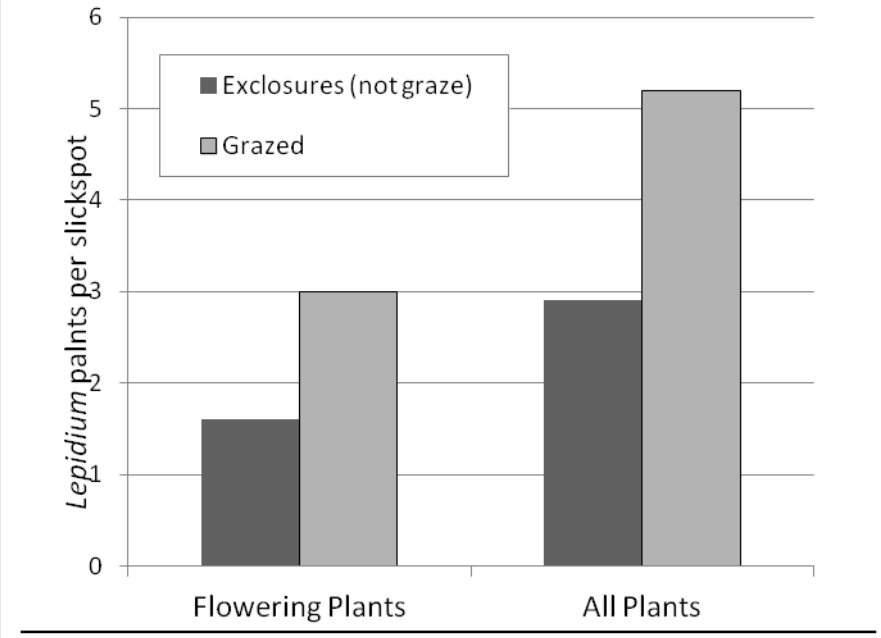

Figure 1. Mean number of flowering and total slickspot peppergrass plants per occupied slickspot in 2011.

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Table 1. *Average number of flowering (annual + biennial) and total plands [flowering + non-flowering (rosette)] per slickspot for each of 15 study sites sampled in 2011. Density values are calculated based on slickspots sites occupied Lepidum only.*

		Lepidium Plant Count and Average per Slickspot				
Site		**2010**			**2011**	
		Total Flowering	**Total Plants**		**Total Flowering**	**Total Plants**
Holding Pen Seeded Exclosure		5	58		0	2
Ave/slickspot		0.63	7.25		0.00	1.00
Holding Pen Native Exclosure		176	696		50	106
Ave/slickspot		9.78	38.67		3.57	7.57
Three Creek Exclosure		1	1		1	1
Ave/slickspot		1.00	1.00		1.00	1.00
Airbase Exclosure		34	52		17	24
Ave/slickspot		3.78	5.78		2.83	4.00
Juniper Butte Exclosure					13	29
Ave/slickspot					0.52	1.16
Holding Pen Grazed		310	473		15	39
Ave/slickspot		14.76	22.52		0.83	2.17
South Clover		775	1966		23	36
Ave/slickspot		33.70	85.48		1.92	3.00
South Clover West					0	3
Ave/slickspot					0	3
Juniper Butte					54	78
Ave/slickspot					3.60	5.20
Juniper Butte South					7	20
Ave/slickspot					1.40	4.00
Clover Butte					141	250
Ave/slickspot					8.29	14.71
Airbase Grazed					10	11
Ave/slickspot					5.00	5.50
Inside Desert					1	3
Ave/slickspot					0.50	1.50
Three Creek New					17	24
Ave/slickspot					8.50	12.00
Middle Butte					1	2
Ave/slickspot					0.50	1.00

PROCEDURES FOR 2012:

The sites examined in 2010 and 2011 will be revisited and presence and dinsity of slickspot peppergrass plants will be recorded. These data will become the baseline against which future changes in *Lepidium papilliferujm* populations will be contrasted.

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AT THE UNIVERSITY OF IDAHO

2011 Project Progress Report:

Impact of Livestock Grazing on the Primary Insect Food Items of the Greater Sage-grouse

By Stephen Cook and Kelly Crane

FIRST-YEAR RESULTS:

Weather conditions prevented access to the study area in May. Therefore, two trips were taken during 2011 (June to begin identifying potential study sites and July to establish initial sites and collect insect specimens). Eight sampling sites were established in the vicinity of known sage-grouse leks and sampling transects were situated so that they occurred inside (without domestic grazing activity) and outside (with grazing activity) of established grazing exclosures. All sites were in Twin Falls Co., ID (within 25 km of Rogerson, ID) and were selected in collaboration with the BLM.

Insect Sampling Results

Grasshopper densities were extremely low in 2011 throughout the research area. Sweep-net sampling was conducted using four, 1-minute transects per site (2 transects inside and 2 outside of exclosures). No more than 2 grasshoppers were captured per transect (the majority of transects resulted in no captures). By comparison, in a prior study examining a different disturbance (prescribed burning) but also occurring in sagebrush steppe habitat in southern Idaho, we captured an average of 34 grasshoppers per transect in treated areas and just over 10 grasshoppers per transect in non-treated areas. Weather (i.e. temperature and moisture) can influence both the overall hatch rate and survival of grasshopper eggs and this may have played a significant role in the low grasshopper densities during 2011. However, sampling occurred during the time period when sage-grouse chicks would have been completing development and it is important to note that the low occurrence of grasshoppers was unrelated to where transects were located (inside versus outside of exclosures).

Although the density of scarab beetles (primarily dung beetles) was also low, more were captured outside of the exclosures (where previous grazing occurred) versus inside the exclosures. There were primarily three genera of scarabs captured (*Canthon*, *Copris* and *Orthophagus*) and all three of these genera are dung-feeders. The beetle species that were reared from dung piles were in these three genera but rearing had to occur from old dung piles because of the delay in cattle grazing activity on the BLM allotments in the area during 2011. Densities of tenebrionid beetles were also very low both in and out of the exclosures. Because of the delay in grazing activity and the low number of individuals captured, no statistical analysis was conducted using the scarab or tenebrionid data.

The density of *Pogonomyrmex* ant colonies was significantly higher ($t = 2.75$; $df = 7$; $[P > t] = 0.0284$) inside the grazing exclosures (distance between colonies = 15.2 $\pm$ 1.4 m) versus outside of the exclosures (distance between colonies = 20.5 $\pm$ 1.5 m). However, there was a higher overall diversity of ants outside of the exclosures (possibly due to the use of older dung piles as colony sites by some ant species such *Solenopsis*). The overall community of ants present on the sites was comprised of species in the genera (*Pogonomyrmix*, *Myrmica*, *Temnothorax*, *Lasius*, *Tapinoma*, *Formica*, *Aphaenogaster*, and *Solenopsis*). Similarly, in a prior project examining a different disturbance (prescribed fire), we found altered ant densities and community structure in treated versus non-treated areas

PROCEDURES FOR YEAR 2:

A minimum of 20 sample sites will be established and sampled during 2012. Sites will be established in the same manner as 2011, using paired (inside versus outside of exclosure fence) transects. Sampling will occur during June and July. All 20 sites will be sampled during each of the sample periods and will concentrate on three insect groups (ants, scarabs and grasshoppers).

Ant communities will be sampled using three techniques. First, short transects of pitfall traps (6 traps per site, 3 inside and 3 outside of the exclosure fence) will be placed at each site. Next, the density of large-colony forming *Pogomymyrmix* and *Formica* will be determined based upon nearest neighbor measurements (as was done in 2011). Finally, the nearest dung pile (within 10 m) to each large ant colony will be examined for additional ant colonies and representative specimens collected. An overall comparison of ant communities captured inside versus outside of the exclosure fence will be conducted.

Grasshopper communities will be sampled using sweep net techniques similar to 2011. Four transects (2 inside and 2 outside of the exclosure fence) will be swept for 60 seconds each. Grasshoppers will be identified to family, maturity (nymphs and adults) and species (for adults). Any grasshoppers captured in the pitfall traps will also be identified. An overall comparison of grasshoppers will be conducted between the communities captured inside versus outside of the exclusion fence.

Scarab beetles will be sampled using the same sweep-net transects and pitfall traps described above. In addition, directed sampling of the nearest dung pile to the large-ant colonies will occur (when present). As with the ant and grasshopper samples, comparisons of scarab community occurring inside versus outside of the exclosure fences will occur. Similarly, any tenebrionids captured on the sites will be identified and compared.

Along with the targeted families, all captured insects will be identified to family and used to determine and compare the composition of insect communities between grazed/non-grazed areas (abundance, species richness, and biomass) using paired multivariate analyses and analysis of covariance techniques. Correlation analyses will be used to determine insect associations with specific vegetation parameters. All statistical comparisons will be conducted using the SAS or STATISTIX packages.

ADDITION TO ORIGINAL DESIGN:

If found, Sage grouse scat will be collected from the sites. Scat samples will be processed in Moscow by dissolving the samples in 95% EtOH and collecting all insect parts that are present. Insect parts will be identified to the level of family (when possible) for comparison with the insect collections from the sites.

DURATION:

The project was originally proposed as a two year project. This is the second year of the project and a final report will be completed by December 31 December 2012. However, if sample numbers remain low, a third summer of sampling may be recommended.

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2012 Proposed Project:

Study of Plant Composition Behind Established Riparian Exclosures.

By Shannon Williams, Alex Fremier, and Allen Bradbury

JUSTIICATION OF PROPOSED PROJECT:

Lemhi County is home to 9,064 miles of streams and rivers. They are considered critical habitat for Chinook salmon and steelhead. It has become common practice to fence livestock out of riparian areas to protect the area from the impact of grazing. There are 30 miles of riparian exclosures from projects completed by Upper Salmon Basin Watershed Program within the Lemhi watershed. This does not include exclosure projects from Idaho Department of Fish and Game, United States Forest Service or Bureau of Land Management. Some of the exclosures have been in for over 15 years.

Ranchers in Lemhi County have been pro-active in protecting habitat and improving riparian areas since 1992 when the Lemhi River, Pahsimeroi River and East Fork Salmon were designated as critical habitat. Later, the Salmon River Basin was also designated as critical habitat. Funding agencies for habitat improvement have dictated that a minimum set-back for riparian fencing projects on streams and rivers would average 35 feet from the ordinary high water mark. In some cases this has created long narrow corridors along the waterways that have had little or no management since the exclosure fence was erected. Habitats behind these fences naturally improve the first years that the fences are erected. As we have walked behind these fences of exclosures that have been in for more than 15 years, we observed old decadent grasses, bare soil and the intrusion of noxious weeds.

The "health" of these riparian exclosures has been the topic of discussion at Upper Salmon Basin Watershed Program Advisory Committee meetings, Lemhi Soil and Water Conservation District meetings, and Lemhi County Cattle and Horse Growers meetings along with the natural resource agencies in the county. There have been some general discussions that the same habitat improvement could be achieved with the utilization of a temporary exclosure and eventually a riparian pastures rather than permanent riparian exclosure. Currently funding agencies do not want to fund fencing for riparian pastures, only permanent exclosures. A preliminary search for scientific data to explain our observations of degrading habitat was unsuccessful for published information.

This project would serve the ranching industry by looking at the long term-plant composition and frequency in permanent riparian exclosures and subsequent recommendations . It would also serve the scientific community by collecting, analyzing and publishing vegetation data in permanent riparian exclosures.

PROCEDURES PROPOSED FOR 2012:

We will gather background information about riparian exclosures on public lands and private lands and identify exclosures for study. Information to include: Location, Size, Date Established, and Current management being exercised,Soil type. We will categorize exclosures into "classes" by the length of time established as of January 1: 0 to 5 years, 6 to 10 years, 11 to 15 years, 16 years and more, Develop study protocol and establish preliminary plots , Analyze preliminary data to test study protocol.

Our overall goal for this project is to develop recommendations for management of long-term exclosures to maintain a healthy plant community. Based on our work, we hope long-term health of the riparian plant community will be considered when decisions are being made in regards to a permanent exclosure vs. a temporary exclosure .