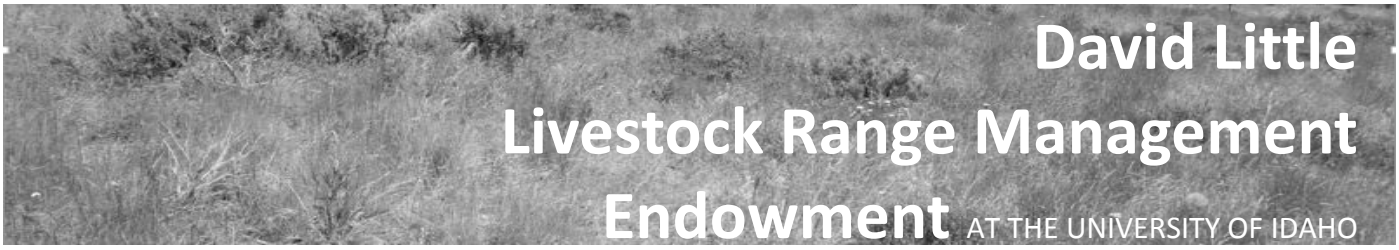


2014 Project Progress Report:

Distribution of Fuel Components in Sagebrush Steppe- targeted grazing applied to reduce wildfire spread.

By Eva K. Strand and Scott Jensen

Background

Large and frequent wildfires have plagued southern Idaho over the past decade, many of those fires are several 100,000 acres in size. These fires reduce wildlife habitat in sagebrush steppe, contribute to the expansion of invasive grasses such as cheatgrass, and reduce the amount of forage that is available for livestock grazing. Our project is researching the impact of targeted cattle grazing in the dormant versus peak biomass season, on fuel load and rangeland integrity. We will examine how the timing and intensity of grazing affects the plant community and the impact on fire behavior.

Hypotheses and Objectives

The overarching objective is to quantify the effect of peak biomass versus dormant season grazing on fuel loads, spatial distribution of fuels, and species composition.

- We hypothesize that cattle grazing during the peak biomass season will reduce overall fuel load, measured at peak fire season, more than cattle grazing in the dormant season.
- We hypothesize that grazing in either season, will reduce fuel loads and continuity to the point that it reduces fire behavior as the fire moves through the grazed areas.

Site locations:
Two sites in the Reynolds Creek area in Owyhee County were selected based on the willingness of three ranchers, Jerry Hoagland, Brad Huff, and Theron Hook to participate. Proximity of the sites was also a decision criteria because animals must be moved from one site to the other. The first site is set near the Reynolds Creed ARS station at an elevation of 4000 ft in a Wyoming big sagebrush steppe (300 pounds herbaceous biomass per acre). The second site is higher up the creek at 5250 ft elevation in a mountain big sagebrush steppe (800 pounds herbaceous biomass per acre). Each site has three replicates of five treatments. Each treatment is duplicated within the replicate and only one of the duplicates will be burned, resulting in a total of 60 plots.

Changes in Methods:
At the time of submission of our 2014 proposal, our project was just beginning to develop. In the past year, we have made some changes which have further increased the power this project has to offer. First, our original plot size of 60 x 60 meters was too big for the terrain of the Owyhee's. Plots of 30 x 30 meters fit the topography better and allowed us to add more replicates and an additional site which will provide more powerful data (Figure 1). The two sites have differences in production, plant community composition, and plant density, and shrub cover which will help us understand when and where cattle grazing can be effective at reducing fire risk and how site locations should be selected when using targeted grazing for fuels management.

According to the Little Endowment's suggestion, we are working with BLM and the local Range Fire Protection Association (RFPA) to implement a controlled burn in September of 2015 (Figure 1). The data collected in 2014 and the summer of 2015 will be used in Dr. Strand's fire model to predict what a wildfire will do in each plot, then we will compare this prediction with actual burn results to further calibrate our models.

For the conclusion of this study, we plan to hold a workshop to present our findings with ranchers and local rangeland and fire professionals. This workshop will be conducted in the fall of 2015 or spring of 2016 where we will demonstrate the effects of cattle grazing treatments and prescribed fire on the plant community composition and structure in our plots.

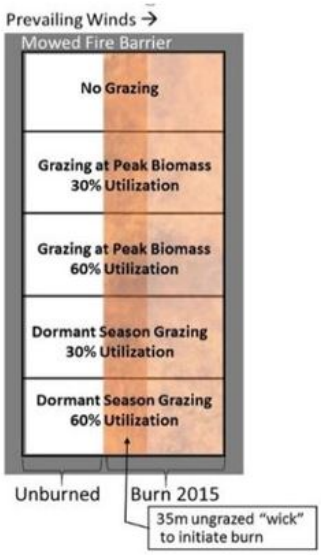


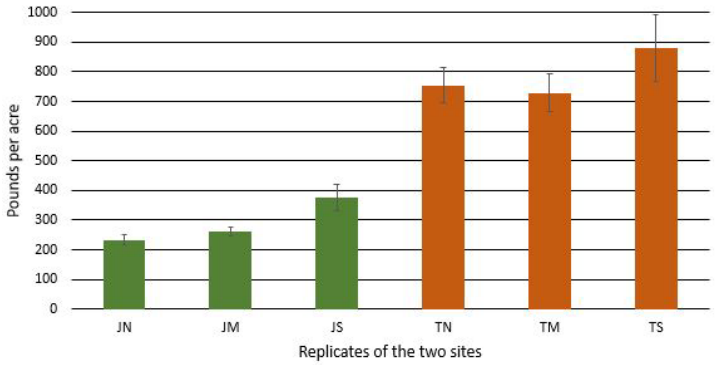
Figure 1. The plot layout for grazing scenarios and burn treatment

Preliminary Data

In May of 2014 we established the corners of each of the six replicates by recording the GPS coordinates. The three upper replicates were also fenced because cattle graze in the pasture during some parts of the year. The three lower replicates are located in an area that is not used for livestock grazing. Pre-grazing biomass was estimated in June and July (Table 1 and Figure 2). Measurements included: estimated biomass (two transects with 10 50x50 cm quadrats each), grass height at each meter along both transects, and shrub cover along each transect. A shrub profile (length, width, height, and species) was documented for each shrub along the transect. This data will be used to create better vegetation distribution profiles for the fire model.

Jerry Hoagland and Brad Huff allowed the use of 10 yearling heifers to complete the grazing for both the peak biomass and dormant season grazing this year. From the pre-grazing data, biomass per plot was calculated and used to estimated the number of heifers required to remove 30 or 60% of the total biomass in one day (Table 1). Fencing provided by the Rangeland Center and Owyhee County Extension kept the heifers in the plots during grazing. Visual assessments were also done periodically during grazing and fine adjustments made to ensure accurate utilization levels. Post monitoring of biomass and canopy cover were then done to measure the changes in plot characteristics post grazing. The post grazing data has not been processed at this time.

Figure 2. Average load of herbaceous biomass within Wyoming sagebrush (green) and mountain big sagebrush (orange). The replicates are labeled JN, JM, JS, TN, TM, TS.



Additional Funding Obtained

This year we were awarded a competitive grant from the Natural Resources Conservation Service (NRCS) Conservation Innovation Grant titled "Developing Grazing Guidelines for Fuels Management" for $65,707. Funding from the Little Endowment provided matching funds for the NRCS-CIG grant.

Table 1. Estimated pounds per acre from pre-grazing data and calculated number of cattle needed to graze at 30 or 60% in one day. Separated by site and replicate. DS= Dormant Season, PB= Peak Biomass, CON= Control.

Plot ID	Treatment	Lbs per acre	Cattle needed 30%	Cattle needed 60%	Plot ID	Treatment	Lbs per acre	Cattle needed 30%	Cattle needed 60%
J-N-01	DS 60	267	1.2	2.3	T-N-01	PB 60	776	3.3	6.7
J-N-02	DS 30	330	1.4	2.8	T-N-02	PB 30	750	3.2	6.5
J-N-03	PB 60	241	1.0	2.1	T-N-03	DS 60	705	3.0	6.1
J-N-04	PB 30	219	0.9	1.9	T-N-04	DS 30	486	2.1	4.2
J-N-05	CON	134	0.6	1.2	T-N-05	CON	1139	4.9	9.8
J-N-06	DS 60	163	0.7	1.4	T-N-06	PB 30	623	2.7	5.4
J-N-07	PB 30	249	1.1	2.1	T-N-07	DS 60	761	3.3	6.6
J-N-08	DS 30	234	1.0	2.0	T-N-08	CON	657	2.8	5.7
J-N-09	CON	230	1.0	2.0	T-N-09	DS 30	683	2.9	5.9
J-N-10	PB 60	263	1.1	2.3	T-N-10	PB 60	968	4.2	8.4
J-M-01	PB 60	237	1.0	2.0	T-M-01	DS 60	909	3.9	7.8
J-M-02	DS 60	267	1.2	2.3	T-M-02	DS 30	820	3.5	7.1
J-M-03	CON	334	1.4	2.9	T-M-03	CON	776	3.3	6.7
J-M-04	DS 30	275	1.2	2.4	T-M-04	PB 60	553	2.4	4.8
J-M-05	PB 30	364	1.6	3.1	T-M-05	PB 30	482	2.1	4.2
J-M-06	CON	252	1.1	2.2	T-M-06	PB 30	1054	4.5	9.1
J-M-07	PB 60	252	1.1	2.2	T-M-07	DS 60	876	3.8	7.6
J-M-08	PB 30	212	0.9	1.8	T-M-08	CON	464	2.0	4.0
J-M-09	DS 60	215	0.9	1.9	T-M-09	DS 30	768	3.3	6.6
J-M-10	DS 30	215	0.9	1.9	T-M-10	PB 60	583	2.5	5.0
J-S-01	PB 60	271	1.2	2.3	T-S-01	CON	801	3.5	6.9
J-S-02	CON	416	1.8	3.6	T-S-02	PB 30	1477	6.4	12.7
J-S-03	PB 30	315	1.4	2.7	T-S-03	DS 60	319	1.4	2.8
J-S-04	DS 30	757	3.3	6.5	T-S-04	DS 30	653	2.8	5.6
J-S-05	DS 60	330	1.4	2.8	T-S-05	PB 60	1317	5.7	11.4
J-S-06	DS 30	289	1.2	2.5	T-S-06	CON	1020	4.4	8.8
J-S-07	DS 60	338	1.5	2.9	T-S-07	PB 30	857	3.7	7.4
J-S-08	CON	334	1.4	2.9	T-S-08	DS 60	1039	4.5	9.0
J-S-09	PB 30	356	1.5	3.1	T-S-09	PB 60	813	3.5	7.0
J-S-10	PB 60	356	1.5	3.1	T-S-10	DS 30	497	2.1	4.3