PROJECT NO: GRN 301

TITLE: Targeted Grazing by Goats to Control Yellow Starthistle in Canyon Grasslands of Northern Idaho.

PERSONNEL: Dr. Karen Launchbaugh (UI Rangeland Ecology and Management).

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ACCOMPLISHMENTS:

In 2006 and 2007, we worked with the Forest Service to secure funding for a project to examine if targeted grazing by goats could provide an ecologically beneficial and effective tool for yellow starthistle control in Idaho. We proposed studying the responses of rangeland infested with yellow starthistle to late-season repeated grazing by goats. We hypothesized that goats will readily consume starthistle when spines begin to develop and continued through senescence. We further hypothesized that this consumption will lead to fewer seedheads in grazed areas compared to ungrazed exclosures. We successfully initiated this research project and conducted vegetation assessments in 2006. We continued the grazing treatment and vegetation assessment through 2007.

Figure 1. Goats on Bentz Ridge.

The study area was located on lower Bentz Ridge, northeast of White Bird, Idaho on the Salmon River Ranger District of the Nez Perce National Forest (Fig.1). The region is open, steep, and generally southeast-facing grassland slopes with yellow starthistle occurring from large patches to scattered plants.

Twenty-four paired plots were established in six groups of four and distributed across the study area. Each paired plot consisted of a 7 x 15 m area that was fenced with poly wire net fencing to exclude grazing (control sub-plot) and similar sized adjacent area that was not fenced and subsequently grazed to serve as the treatment sub-plot. In summer 2006, 1233 yearling Boer goats, managed by grazing service provider Ray Holes, grazed about 1000 acres in 73 days (June 25 to Aug.31 and Oct. 10 to Nov. 10). In summer 2007, 1657 Boer nannies grazed about 1600 acres in 42 days (July 27-Sept. 10).

Vegetation assessments in 2007, were provided through support of the David Little Livestock Range Management Endowment and the U.S. Forest Service. The vegetation assessment included monitoring of yellow starthistle plant and seedhead density before and after grazing in each paired plot. Canopy cover of grasses, forbs, and yellow starthistle was also estimated

Initial results indicate that 2006 grazing may have reduced the number of yellows starthistle plants on the study area as plots designated for the grazing treatment had fewer plants than the control-subplots before grazing was initiated in 2007 (Fig. 2). After plots were grazed in 2007, yellow starthistle plant density was 72% lower in grazed (treatment) compared to ungrazed (control) sub-plot (Fig. 2). It was clear that goats removed seed material despite the spines as grazed sup-plots had 99% fewer seed heads than ungrazed sub-plots when examined after grazing (Fig. 3). Cover of yellow starthistle and forbs decreased 77% and 75%, respectively,

in response to grazing (Fig. 4). Treatment and control subplots sub-plots had similar cover of grass after grazing was applied (Fig. 4). Goats readily and thoroughly grazed yellow starthistle as indicated by the prominent lack of seedheads or foliage throughout most of the grazed areas of Bentz Ridge.

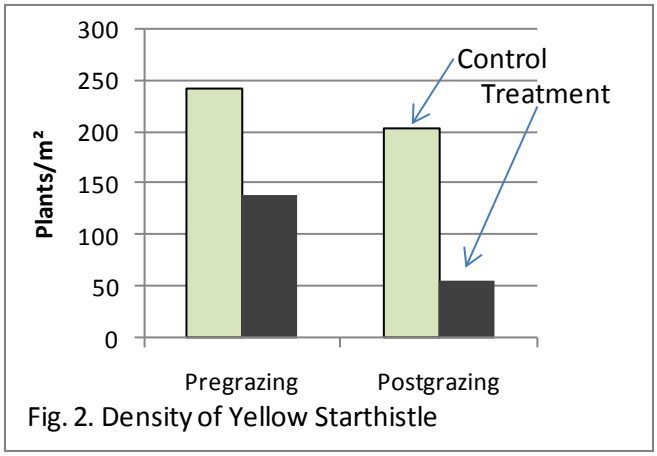

Fig. 2. Density of Yellow Starthistle

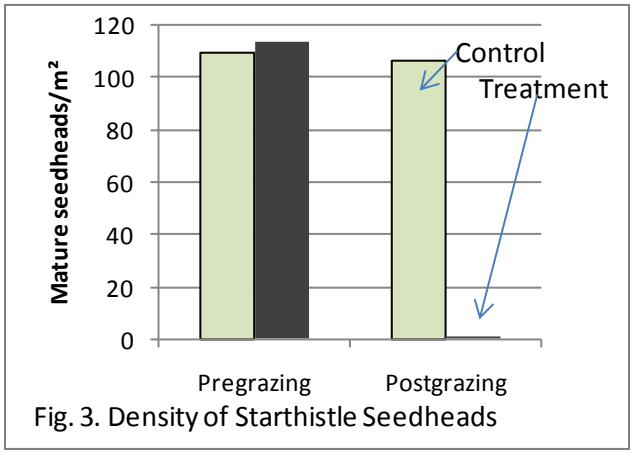

Fig. 3. Density of Starthistle Seedheads

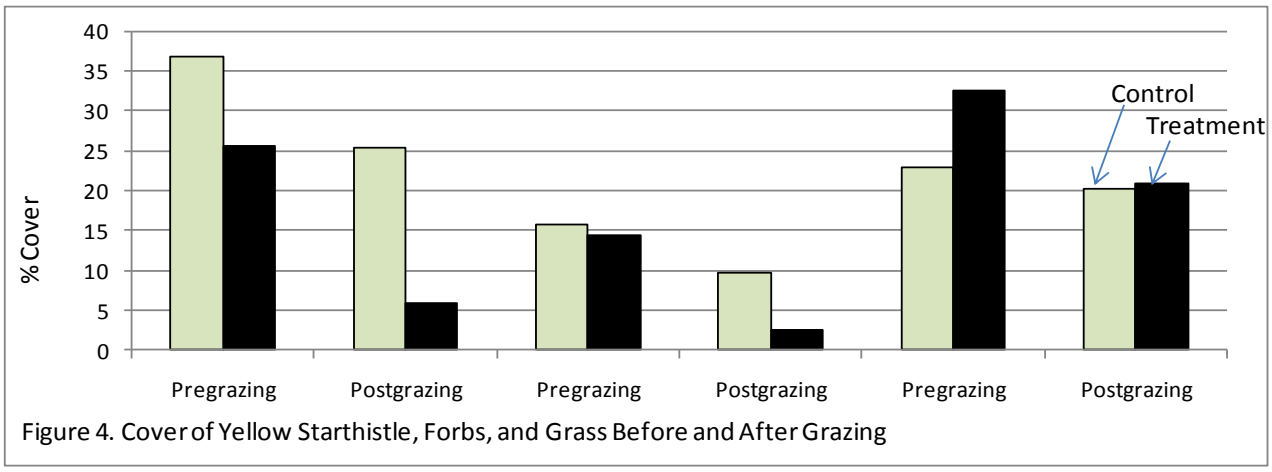

Figure 4. Cover of Yellow Starthistle, Forbs, and Grass Before and After Grazing

This project was made possible in 2006, through a $77,500 contract provided by the U.S. Forest Service and about $7,000 of field support from the University of Idaho (K. Launchbaugh) and the U.S. Forest Service (D. Sorenson). In 2007, the grazing contract was supported by the U.S. Forest Services ($53,500), the American Sheep Industry Association ($10,000) and the Idaho County Weed Board ($15,000). The David Little Endowment supported Brianna Goering ($19,380) in her Master of Science research which included the vegetation assessments in summer of 2007. Additional help on the 2007 field work was supported by the Little Endowment and in-kind contributions from the US Forest Service and the University of Idaho.

PROJECTIONS:

Two seasons of field research have been conducted. Data do not exist on the number of years of targeted grazing required to reduce the abundance of yellow starthistle. However, contract graziers who have worked in yellow starthistle communities indicate that repeated grazing for at least three years is necessary to see reductions in starthistle. The contract awarded to Ray Holes in 2007 was a two-year contract, so we anticipate that targeted grazing will be applied at the Bentz Ridge study site in 2008 allowing us to complete our work.

In the 2008 growing season, we plan to intensify field research on the Bentz Ridge site with additional vegetation assessments before and after grazing. We will conduct vegetation assessment in random spots between groups of plots and quadrats assessed within each sub-plot will increase from eight to ten. I each quadrat we will divide grass cover into annual and perennial grasses. We also plan to assess biomass in research quadrats to give a more complete view of grazing effects. We anticipate final results by December 2008.

Brianna Goering research will be extended in 2008 to include assessments of weed seed viability in feces. We are in initial planning phase of this research, but it will likely include a comparison of weed seeds from 4 weed species and examination of seed passage through goats and sheep with a final assessment of seed viability in feces. This research represents cooperation between the University of Idaho Rangeland Ecology and Management Department, a grazing service provider, Ray Holes, and the U.S. Forest Service, Don Sorensen.

PUBLICATIONS:

We anticipate that this research will yield a graduate student thesis and scientific journal article on prescribed goat grazing for yellow starthistle control in *Weed Ecology and Management*. The procedures and documents necessary for the grazing contract will serve as a model for applying targeted grazing as a weed management tool in the Forest Service and other land management agencies. Information will be shared in training sessions on targeted grazing among land managers, grazing service providers and cooperative weed management teams.

DAVID LITTLE LIVESTOCK RANGE MANAGEMENT ENDOWMENT–
BUDGET FORMAT REQUESTED SUPPPORT FOR 2008:

Allocated by David Little Livestock Range Management Endowment during 2007 $ 19,380

	Receive in CY07	Requested for CY08
Salary	$ 15,500	**$ 16,275**
Irregular Help		**5,760**
Fringe Benefits	155	**508**
Student Fees		
Travel	3,225	**3,225**
Operating Expenses	500	**500**
Capital Outlay		
TOTALS	$ 19,380	**$ 26,268**
Role-over of funds from previous Little Endowment Research Grants	$	**$ 10,450**
TOTAL REQUESTED FOR 2008	$ 19,380	**$ 15,818**

OTHER RESOURCES (Not to be considered cost sharing or match required by sponsor)

Industry	$ 10,000 (ASI support)
Univ. of Idaho (salaries, operating)	9,000
Other (local, state, federal)	60,000 (USFS & Idaho County)
TOTAL OTHER RESOURCES	**$79,000**

TOTAL PROJECT ESTIMATE FOR FY 2003: $26,268 + $79,000 = $105,268

BUDGET NARRATIVE:

Funds are requested for:

- Stipend for M.S. Graduate Student ($16,275).
- Travel (Rental of small pick up for CNR motor pool for 60 days @ $35/day = $2,100. Plus, 30 round-trips from Moscow to White Bird for 250 miles @ 15¢/mile for gas = $1,125).
- Basic field and laboratory equipment ($500)
- Other Resources committed to the project include:
  - Two weeks of salary and fringe benefits for Karen Launchbaugh ($4,900)
  - Laboratory equipment and computers for analysis
  - Support for publication and travel to workshop on related grant ($1,200)
  - Fencing and supplies for constructing exclosures ($2,900; ½ from UI & ½ from USFS)
  - Contract for Targeted Grazing Services (more than $70,000 per year, to be requested from U.S. Forest Service, American Sheep Industry Association, and Idaho County Weed Board in 2008)