

Testing the effects of flaming as a method of medusahead (*Taeniatherum caput-medusae*) control on the Plumas National Forest

Michelle Coppoletta, USDA Forest Service, Plumas National Forest, Quincy, CA



Introduction

Species Ecology:

- Medusahead is a winter annual grass; its seeds germinate with the first rains of fall, over winter as seedlings, flower in late spring to early summer, and set seed and die by late summer or early fall.

- This species reproduces by seed, which is primarily dispersed by wind and water, although it can be dispersed to more distant sites by grazing animals, machinery, vehicles, and clothing.

- Medusahead is able to grow in a wide range of climatic conditions and has been documented in plant communities up to 7,000 feet in elevation.



Photo by Steven Dewey

Distribution of medusahead on the Plumas National Forest

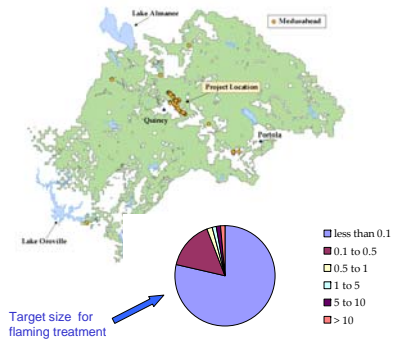


Figure 1. Size distribution (in acres) of medusahead occurrences on the Plumas NF. Arrow indicates target occurrences for flaming treatments.

Recommendations / Lessons Learned

PROS

- Situations where flaming may be a useful tool:
 - small "satellite" occurrences
 - areas of high project activity where risk of spread is high (i.e. landings and alongside roads)
- Equipment is inexpensive, easy to operate, and requires little maintenance (Moore 2004)
- Provides alternative to chemical treatment, has minimal environmental impact, and does not result in ground disturbance that usually favors invasive species colonization (Moore 2004).

CONS

- For annual grasses, treatment is only practical on very small, isolated infestations (very time consuming!)
- In some areas where fire danger is high, there may be a limited window of opportunity for treatment

Research Objectives

This study examined the following questions:

- Does flaming reduce the percent cover of medusahead in experimental plots?
- Is the timing of the treatment an important component for effective control? Are treatments conducted in the spring more effective than those conducted in the winter?
- Are multiple flaming treatments in one year more effective at reducing medusahead density than a single application?

Experimental Design and Methodology

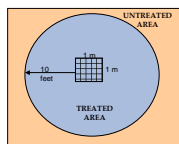


Figure 2. Medusahead plot design

Experimental Design

- 3 experimental blocks
- 5 plots within each block
- 3 Treatments
 - December flaming treatment (n=6)
 - April flaming treatment (n=6)
 - December + April treatment (n=3)



Prior to treatment



After treatment



Figure 3. Flaming treatments were conducted with Weed Dragon™ backpack propane torches (100,000 BTU)

Methodology

-Percent cover for all species was estimated in July of 2005 (prior to treatment) and in July of 2006 (following treatment)

-Environmental variables were recorded for each plot (i.e. slope and aspect)



Results

• **Effectiveness:** All flaming treatments (regardless of treatment timing or the number of applications) reduced the percent cover of medusahead by an average of 74% ($\pm 28\%$).

• **Treatment Timing:** There was a significant difference between winter (December) and spring (April) treatment.

- Winter: reduced medusahead by an average of 56% ($\pm 30.9\%$)
- Spring: reduced medusahead by an average of 95.9% ($\pm 0.9\%$)

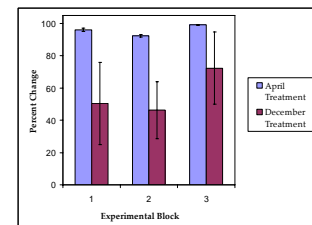


Figure 5. Mean percent reduction (± 1 SE) in medusahead cover in experimental plots in response to winter and spring treatments. Difference between treatments was significant ($n=12$, $p=0.01$).

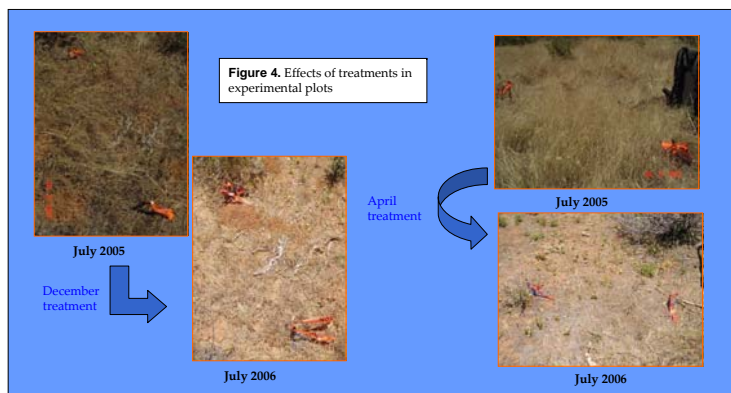


Figure 4. Effects of treatments in experimental plots

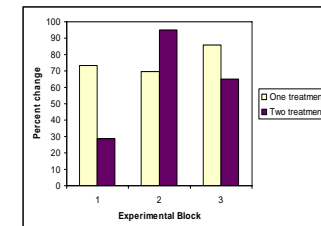


Figure 6. Mean percent reduction in medusahead cover in experimental plots in response to one and two treatments. Difference between treatments was not significant.

• **Number of Treatments:** There was no significant difference between plots that were treated once and those treated twice. However, it should be noted that only 3 plots were treated twice, which did not provide a large amount of experimental power.