

Velvetgrass Control

Glyphosate trial for common velvet grass (*Holcus lanatus*) control in Yosemite National Park

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INTRODUCTION

Common velvet grass (*Holcus lanatus*), a perennial European grass noted as a prolific seed-producer, has invaded many highly-valued wet meadows in Yosemite National Park. Three years of manual treatment of velvet grass in Yosemite yielded poor control, was very time-intensive and caused soil disturbance that likely activated the velvet grass seed bank. Chemical treatment may provide better control because of the greater efficacy of herbicide and because the plants can be removed without soil disturbance.

QUESTION

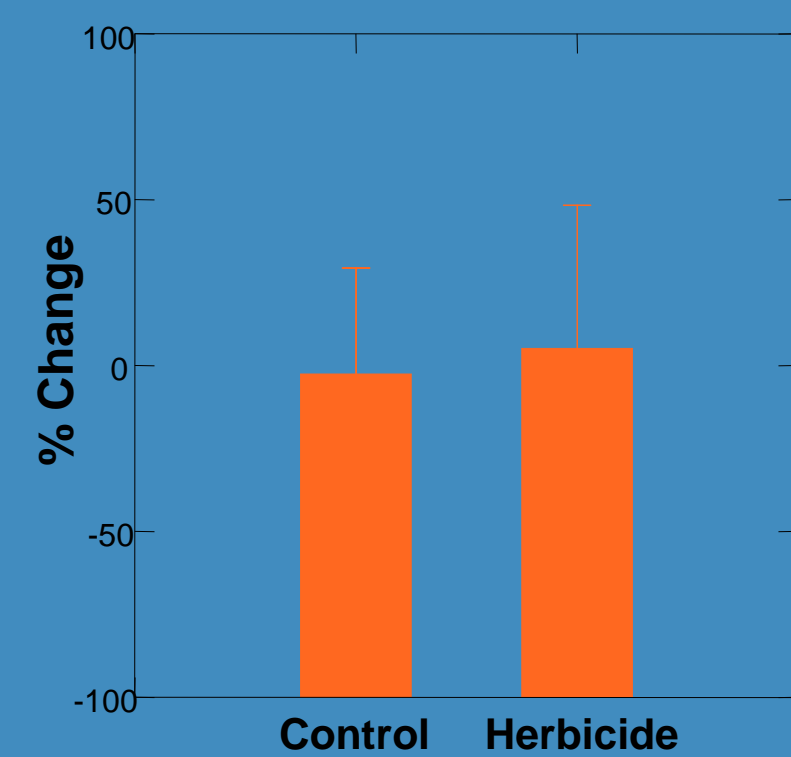
Is a 2 % Aquamaster herbicide formulation with 2% Agridex surfactant an effective tool for the control of *Holcus lanatus*?

METHODS

In summer 2009, we established 3 m diameter plots in three lower montane meadows with widely distributed velvet grass infestations. Each plot had between 5-40% velvet grass cover in a matrix of other plant species. *Herbicide* (n = 44) and *control* (n = 18) treatments were randomly assigned. Before and one year post-treatment, we recorded the percent cover of velvet grass and all other species and photographed the plots.

RESULTS

- The prescription employed was ineffective at controlling velvet grass; there was no reduction in cover compared to the control (see figure).
- Plants observed in the spring (May) were both seedlings and also robust clumps—seemingly regenerated from perennial roots.
- The glyphosate application removed above-ground biomass; we observed fully desiccated foliage within weeks of application.



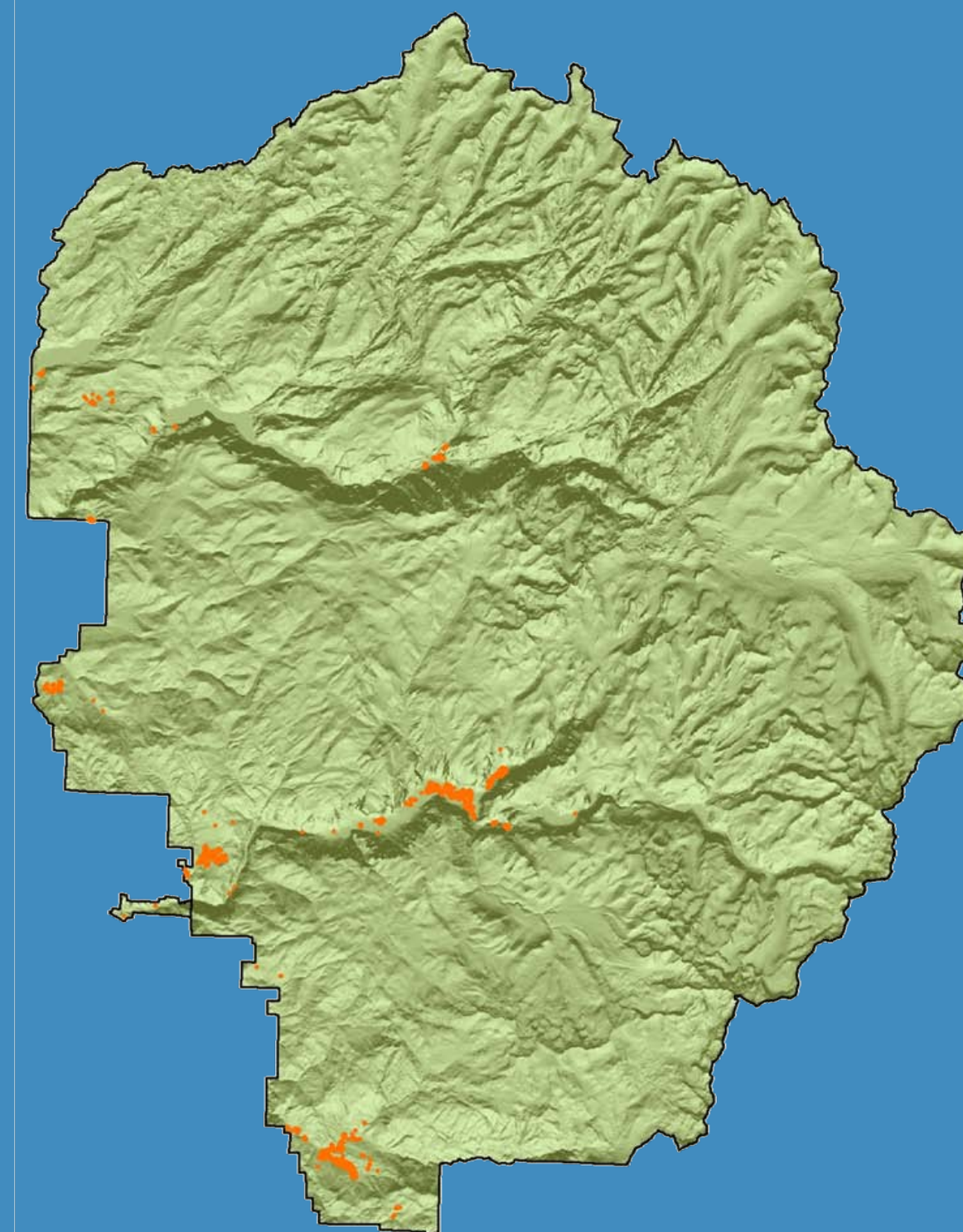
Percent change in velvet grass cover by ocular estimation. Error bars represent one standard deviation.



Images by M. Hutten



Velvet grass in Big Meadow towers over the rare yellow-lip pansy monkeyflower (*Mimulus pulchellus*). The pansy monkey flower is a Yosemite National Park special status species. It is also listed by the California Native Plant Society as category 1B.2: “plants rare, threatened or endangered in California with a moderate immediacy of threat.” It is endemic to California State, found only in three Sierra Nevada counties (Calaveras, Mariposa, Tuolumne).



Documented distribution of common velvet grass in the park (left). A study plot placed in Big Meadow (right). Velvet grass has occupied a large portion of this and other meadows in Yosemite.



Daniel Bracken spot-sprays velvet grass with a 2% glyphosate solution. Blue indicator dye helps show where the herbicide has been applied.

A solution of only 0.5% Agridex surfactant applied to velvet grass shows that this standard concentration is far too low. Because the foliage is covered with velvety hairs, a 2% surfactant solution is needed.



DISCUSSION

Because the foliage was observed to die-back, the herbicide clearly had an effect on velvet grass. Why that did not lead to reduction of cover could be explained in a number of ways:

1. The herbicide concentration was too high causing “top-kill”; that is, heavy damage to foliage precluded herbicide translocation below-ground. The plants regenerated from surviving roots.
2. A large proportion of below ground biomass was not connected to above-ground biomass. The plants regenerated from surviving belowground biomass.
3. Plants observed post-treatment regenerated from seed: new observations show new foliage after the first fall rain. This suggests that, like many invasive annual grasses, velvet grass takes rapid advantage of the fall rains. This would explain why plants appeared so robust by spring. → Further work is needed to ascertain why the treatment did not work and what would work better.

FUTURE WORK

- We have begun a new study in collaboration with USGS to examine a range of glyphosate concentrations, including lower rates. First-year results will be available in summer 2011.
- Another treatment approach might be to treat velvet grass in the fall. We will conduct a pilot glyphosate application to velvet grass this fall (October) and monitor its effects.