Blackberry Control

Trials of aminopyralid and a cut-and-dab method for Himalayan blackberry (*Rubus armeniacus)* control

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INTRODUCTION

Invasive species may invade areas that contain rare or special status plants (Huenneke and Thomson 1995) or plants that are gathered by American Indians (Pfeiffer and Voeks 2008). Off-target damage of these desirable native plants during invasive plant control may be mitigated with a selective herbicide or a targeted application technique. Concerns of Himalayan blackberry occurring with cultural-use plants, rare plants or adjacent to water have prevented managers from treating all populations.

OBJECTIVE

Determine efficacy of two mitigation measures—application of aminopyralid (Tradename, Milestone®), a selective herbicide, and application of glyphosate using the cut-and-dab method—as well as a foliar application of glyphosate for use in Yosemite National Park.

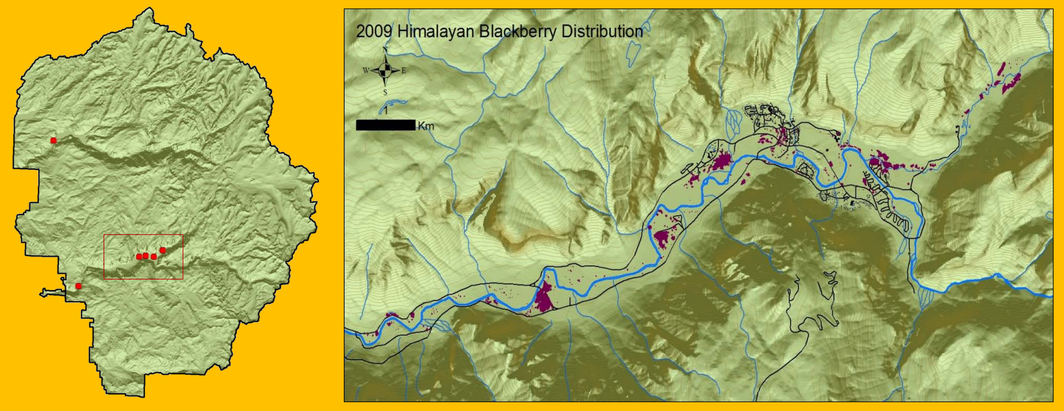
METHODS

At six sites in the lower montane region of Yosemite, we established 3 plots (6 m X 6 m). We randomly assigned one of three treatments to each plot: glyphosate (2%), aminopyralid (7 oz./ac) and control. An additional plot was established, non-randomly but with similar conditions as the other plots, at 4 of the 6 sites to test the *cut-and-dab* treatment using undiluted glyphosate.

We recorded pre and post-treatment percent *R. armeniacus* cover by visual estimation and stem density in the central 2 m x 2 m quadrat. We calculated the percent change in stem density and percent cover for each plot $(t_2\text{-}t_1)/\ t_1 * 100$.

Sean applies glyphosate concentrate to freshly cut blackberry stems. This technique eliminates herbicide contact with off-target plants.

Fig. 2. Comparison of a glyphosate treatment with a control unveils no surprises (a). Aminopyralid treatments yielded variable results: while many sites saw a drastic reduction of Himalayan blackberry and persistence of native species, blackberry was little affected at other sites (a).



Study sites (left) and blackberry-infested area in Yosemite Valley (right). Himalayan blackberry has invaded 100 acres of forest understory, meadows and riparian habitat in the park.

Greg Archer applies herbicide with a backpack sprayer—the technique used most commonly for herbicide application at Yosemite.

Caroline Nelson establishes study plots in Yosemite Valley. Himalayan blackberry has formed dense thickets in wetlands and displaced native vegetation.

RESULTS

- All three methods are effective at controlling *R. armeniacus* (Fig. 1)
- Foliar glyphosate applications yielded the most consistent result with very high levels of control but also observed off-target damage (Fig. 2a).
- Aminopyralid-treated blackberry demonstrated highly variable responses (Fig. 2b). Not only was this phenomenon captured in the plot data, but also in treatments elsewhere in the park; field technicians observed a range from no change to nearly 100% control on infestations.
- The cut-and-dab method was effective (Fig. 3)

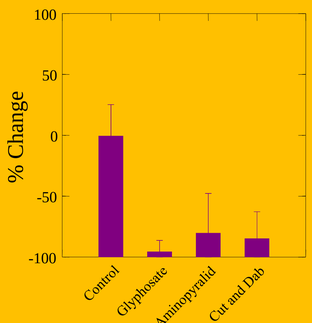


Fig. 1. Percent change in Himalayan blackberry cover, 2009 – 2010.

Fig. 3. Untreated blackberry grows over the adjacent *cut & dab* plot. Within the plots, there was little regrowth.

DISCUSSION & CONCLUSIONS

For our general treatment approach, we have abandoned aminopyralid and will use a foliar application of glyphosate. The variability of efficacy suggests that there are interactions with environmental factors that we do not understand. Timing of application may be a factor; field technicians noted that the more successful applications occurred earlier (summer) and those that failed were later in the season (fall). When highly selective removal is necessary as a mitigation measure, we will employ the cut-and-dab method. However, there are trade-offs; the method is more time-consuming and it exposes the applicators to concentrated herbicide. This study will continue for two more years, after which we can revisit our conclusions and make a more definitive recommendation.

LITERATURE CITED:
Huenneke, L. and J. Thomson (1995). "Potential interference between a threatened endemic thistle and an invasive nonnative plant." Conservation Biology **9**(2): 416-425.
Pfeiffer, J. and R. Voeks (2008). "Biological invasions and biocultural diversity: linking ecological and cultural systems." Environmental Conservation **35**(04): 281-293.