

Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Gardiner Basin Restoration Trials Using Indaziflam (Esplanade) Herbicide

Discipline: Natural

Type of Project: Technical Assistance

Funding Agency: National Park Service

Other Partners/Cooperators: University of Montana

Student Participation: Yes

Effective Dates: 6/1/2018 - 5/1/2021

Funding Amount: \$95,155

Investigators and Agency Representative:

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Project Abstract: A. Project Goals - To evaluate the control efficacy of a recently-registered herbicide (Esplanade, manufactured by Bayer Environmental Sciences) with a novel mode of action on invasive weeds in 2 sites over a 3-year period to facilitate YNP native vegetation restoration efforts. The project will further quantify the release of in-situ perennial grasses previously planted, and the germination success of 10 native plant species proposed to be drill-seeded on these 2 sites in the fall of 2018.

B. Project Objectives - Following NPS approval, two native vegetation restoration sites in the Gardiner Basin of YNP dominated by invasive annual weeds (Site 1, Stevens Creek, annual wheatgrass; Site 2, Cinnabar, desert alyssum) yet containing some residual previously-seeded native perennial grass species, were treated with Esplanade herbicide (0.62 acres total) at 3 oz and/or 5 oz/acre on 16 August 2017. Using a split block (Stevens Creek, 0.34 acres) or randomized complete block (Cinnabar, 0.28 acres) design to include no-treatment controls, frequency of occurrence grid cell counts (Vogel and Masters 2001), ANOVA analysis, and multiple comparisons testing, the objectives of this project are to quantify:

1. The control efficacy of invasive annual weeds in spring (grid cell counts) and fall (ocular estimates), 2018 through 2020 (both sites).
2. The release of in-situ perennial grasses from competition with controlled invasive weeds in spring (grid cell counts; biomass produced), 2018 through 2020 (Cinnabar site only).
3. Germination success (grid cell counts) of 10 native plant species (~10 lbs pure live seed), drill-seeded in the fall of 2018, during spring of 2019 and 2020 (both sites).
4. Following the field work, compile a jointly authored draft manuscript for submission to a peer-reviewed journal on native vegetation restoration or invasive weed management.

Keywords: Esplanade, Restoration, Herbicide, Invasive Plants, Gardiner Basin, University Of Montana, Yellowstone National Park, National Park Service