Effectiveness of Selected Native Plants as Competitors with Non-Indigenous and Invasive Knapweed and Thistle Species

Conservation
CS-1389

Background:

The U.S. military must continually maintain its natural resources to ensure the long-term sustainability of ecosystems while providing military training opportunities that facilitate national defense. Non-indigenous, invasive plant species negatively impact military training and diminish the sustainability and function of natural ecosystems. The management and control of exotic invasive plant species has traditionally targeted the direct removal of weed species, often with diminished integrity of non-targeted native species as a consequence. This project moves beyond direct weed eradication techniques to examine the inherent resistance of native plant populations to non-native weed encroachment and dominance. By identifying especially competitive native individuals, the research can provide a tool for the revegetation of invaded sites and return of indigenous plant communities.

Objective:

The objective of this project is to develop and refine methods for controlling non-indigenous invasive species by capitalizing on the apparent resilience of native communities. This work identifies the ability of selected species to compete with and limit the establishment and spread of weeds. It supports integrated natural resource management that enhances the sustainability of ecosystems.

Process/Technology Description:

This research involves identifying and propagating native plant genotypes derived from within very old weed invasions. The targeted populations will be selected based on their demonstrated ability to naturally compete with non-indigenous invasive plant species. Field investigations and collections on U.S. Army, U.S. Air Force, and other federal lands will retrieve representative native populations that remain extant within weed invasions. Examination of genetic variation within these populations will suggest their potential for being especially competitive with weeds (e.g., Russian knapweed). Greenhouse competitive evaluations to identify especially competitive plants will enable the selection of promising genotypes. Development of selected genotypes for seeds will transfer the project's focus to field plantings in order to evaluate the resistance of selected natives to the presence of weeds in a natural setting.

Expected Benefits:

This research will (1) facilitate military training and operations by increasing success of weed removal, (2) complement other integrated non-indigenous invasive species control technologies by providing tools for successful revegetation following weed control to prevent re-entry of invaders, (3) support native ecosystem processes by retaining native gene pools, and (4) preserve long-term sustainability of native communities used for U.S. military training sites. The study is of international scientific interest because of its potential to provide a new approach to integrated weed control and simultaneously retain the genetic components of native plant populations. By developing native seed sources for revegetation efforts that limit the return of weeds, the study offers a unique opportunity for incorporating native plant genetic variation into commercially viable native plant seed sources. Successful completion of this research will provide more economically feasible, effective, and environmentally sustainable weed control methods. (Anticipated Project Completion - 2010)

Russian knapweed often forms dense stands in western wildlands and may serve as a selective agent on remnant native plants that survive invasions.

Contact Information:

Dr. Ann Hild
University of Wyoming
Department of Renewable Resources
Box 3354
Laramie, WY 82071
Phone: (307) 766-5471
Fax: (307) 766-6403
E-mail: annhild@uwyo.edu

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