Treatment of Exotic Plants on the Rocky Mountain Front

Ebiome

Department of Biology

Leafy Spurge and Spotted Knapweed are two highly noxious weeds that are increasingly spreading throughout the North and Western parts of the United States. The Weed Management Philosophy at Pine Butte Swamp Preserve consists of three goals:

1. Focus on the species and communities wanted in place of the weed species, rather than simply eliminating weeds.
2. Create preventative programs to keep the site free of weeds that are not yet established there.
3. Set priorities according to their actual and potential impacts on native species and communities

Two methods were used to control these weeds.

1. Large patches received biocontrol agents
2. Small Patches received chemical control (Tordon for the Leafy Spurge and Transline for the Spotted Knapweed.

Priority for chemical or biocontrol treatment was given to sites with infestations that could most likely be controlled with available technology and resources.

A bio-control flea beetle was introduced into three Montana grassland sites dominated by leafy spurge. Changes were monitored in leafy spurge abundance and frequency of associated vascular plants in 48 permanent micro-plots immediately before and 14 years after the release. Density and mass of leafy spurge declined 69% over the 14 year of the study across the sites. Total species richness increased by 1.2 species between 1994 and 2008 across all three sites, but the increase differed among sites. Mean richness of exotic species was virtually unchanged across the three sites over the course of the study. Release of the bio-control insects and a large reduction of leafy spurge were associated with an increase in native diversity after 14 year. The increase in native diversity was small relative to the decline in leafy spurge abundance, suggesting that significant increases of native alpha diversity in certain habitats may require many decades.

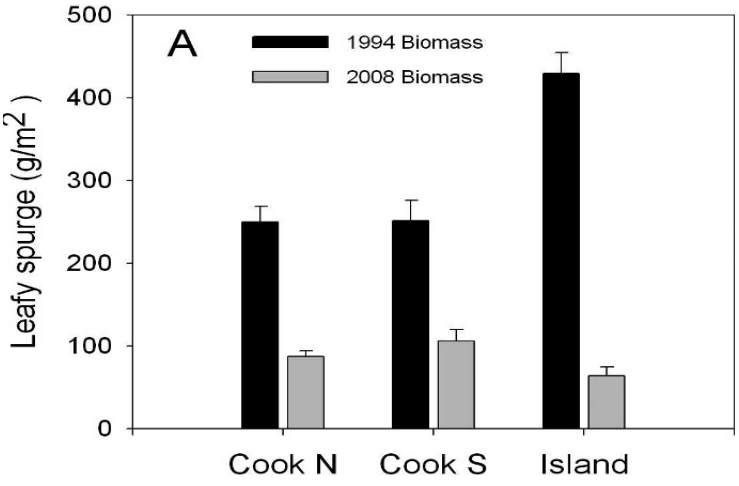

Figure 1. Mass of leafy spurge in three sample macro-pots just before and 14 years after the release of biological control flea beetles.