

Leafy Spurge Eradication and Remote Sensing

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Introduction

- Leafy Spurge (*Euphorbia esula*), is an introduced, noxious weed that can take over large areas of rangeland rendering it unusable for wildlife and most livestock. The insects that helped control it in Europe have been introduced into the United States after extensive testing.







Methods

- Students collected flea beetles (*Aphthona* sp.) from established nurseries.
- The beetles were collected in sweep nets.
- Sorted and counted.
- Distributed on sites infested with leafy spurge.













Problem

- How do we measure the changes due to the introduction of flea beetles into the ecosystem? How can we measure the changes in leafy spurge in the next few years?

Data Collection

- On selected sites to which flea beetles had been added, plant composition data was collected.
- Canopy cover was measured from first hits along five transects at each site.
- Plant populations were measured from stem counts of each species in a 1/4 meter square area.



GPS

- We measured the location of each patch of leafy spurge using a Garmin e-trex unit.
- Using the Track Log feature of the e-Trex we were able to measure the extent of each patch of leafy spurge.
- The GPS data was downloaded into a computer for further analysis.



Remote Sensing

- Dr. Brad Rundquist, Scott Abel and Shubhada Savant from the Department of Geography at the University of North Dakota provided training to us on GPS and remote sensing applications.
- NAIP 2003 Aerial Photography from NDGIS was used as a background for reference.
- The GPS Way points and tracks were plotted on Landsat photographs.
- The acreage of the leafy spurge polygons was calculated.

Conclusions

- The use of GPS to locate and measure the size of leafy spurge patches appears to be a valuable tool to follow the success of eradication efforts.
- Satellite photographs or remotely sensed data hold the promise of improving and simplifying natural resource problems.





Future Research

- We will follow the changes in plant composition in the next few years on leafy spurge infested sites which have been inoculated with flea beetles.
- We will follow the change in size of the leafy spurge patches using GPS tracks and remote sensing applications.
- We hope to develop spectral signatures of leafy spurge from remotely sensed data, which will help us to identify patches of spurge in remote areas of the Standing Rock Sioux Reservation.