

Management Methods: Chemical Methods

ERADICATING ORANGE HAWKWEED

Kodiak National Wildlife Refuge, Alaska

Introduction

Orange hawkweed (*Hieracium aurantiacum*) has occurred in the city of Kodiak, Alaska since at least the 1960s. In 2002, the plant was first observed on Camp Island in Karluk Lake within Kodiak National Wildlife Refuge (NWR) by refuge personnel. By 2003, orange hawkweed covered three acres of the 48-acre Camp Island. Infestations included both dense concentrations in meadows and scattered plants along game trails.

The plant was most likely transported to Camp Island in a potted plant to decorate a cabin, but it has spread on its own across the island and onto adjacent Island Point.

Hawkweed Biology

Orange hawkweed is a perennial forb that initially appears as a low growing rosette. Each rosette can produce 10 to 30 flowering stems with each stem producing five to 30 flower heads. Seeds can remain viable in the soil for up to seven years. Orange hawkweed can also reproduce via rhizomes and stolons and can resprout from any remaining fragment (Rinella and Sheley 2002).

Goal

The refuge developed an Integrated Pest Management strategy with the goal of orange hawkweed eradication and prevention of its establishment elsewhere on the refuge.

The diverse and highly productive native vegetation communities of Kodiak NWR are threatened by orange hawkweed invasion. Left untreated, orange hawkweed has the potential to replace large areas of native forb meadows, an important food source for Kodiak brown bears. Orange hawkweed can form dense mats, decreasing desirable plant species diversity and reducing wildlife value (Rinella and Sheley 2002).

Treatment

Mechanical treatments of orange hawkweed such as mowing are ineffective due to the ability of orange hawkweed to resprout from fragmented roots, stolons, and rhizomes (Rinella and Sheley 2002), and no biological control agents are currently available. The most effective treatment is selective herbicides.

The herbicide, clopyralid, was selected based on site conditions, its effectiveness on orange hawkweed (a member of the sunflower family), its low selectivity for other plant families, and its low toxicity to fishes, birds, and mammals.

Application

From 2003-2007, clopyralid has been applied in June and September of each year. Backpack sprayers equipped with flat-spray nozzles were used for application.

Hawkweed control also included hand removal of flower heads and plants along the lakeshore. Volunteers and refuge staff received training for plant identification, herbicide application, bear safety, shotgun certification, and boat operation.

Monitoring

Permanent plots were established and are monitored annually to assess the response of orange hawkweed and native vegetation to herbicide application.

Orange hawkweed density (number of orange hawkweed plants per square foot) as well as hawkweed and native plant frequencies (number of plants of each species counted within monitoring plots) were recorded in May and July of 2003- 2007.

Results 1

Monitoring results indicate that hawkweed density has declined with herbicide applications. The biggest decline in hawkweed numbers occurred after the first herbicide application in May, 2003. After this time, hawkweed numbers have remained low (40 plants per square foot) and consist primarily of seedlings. The frequency of hawkweed has also declined from 80% in 2003 to less than 40% in 2007.

Results 2

Response in terms of frequency of native forbs since herbicide application has been variable. Members of the sunflower family such as goldenrod (*Solidago* sp.) have persisted within plots but have not increased after treatment. However, other native plant species such as buttercup (*Ranunculus* sp.) have shown an increase in frequency from 20% to over 70% since 2003.

Resurvey

Some hawkweed seedlings and plants concealed by surrounding vegetation were missed by applicators. Successful control of established infestations required a large and consistent commitment of resources.

Following initial treatments and recovery of native vegetation, infestation sites were annually resurveyed and mapped. Site preparation now includes clearing previous years' growth of nontarget vegetation from infestations and marking sites with biodegradable flagging.

Success

Many orange hawkweed patches have been eradicated and desirable native forbs have recovered.

This project has been a true “cooperative weed management” effort. Participants have included: Koniag, Inc., Kodiak Garden Club, Kodiak Soil and Water Conservation District, University of Alaska Fairbanks Cooperative Extension Service, Afognak Native Corporation, U.S. Fish and Wildlife Service staff, and local volunteers.

Outreach generated by this project has provided an impetus to Borough-wide efforts to map invasive weeds on non-Refuge lands, to conduct demonstration projects on other infestations, and to increase public awareness. Funding support for this project was supplied by two Service programs: Challenge Cost Share and Invasives Management with Volunteers.

Learn More

Non-Native Plant Species of Alaska - Hawkweed Species

http://akweeds.uaa.alaska.edu/pdfs/species_bios_pdfs/Species_bios_.pdf

Ousting Orange Hawkweed in Kodiak National Wildlife Refuge

http://www.fws.gov/invasives/volunteersTrainingModule/pdf/bigpicture/AK_Kodiak.pdf

Reference

Rinella MJ, Sheley RL. 2002. Orange and meadow hawkweed. Montana State University Extension Service Bozeman, MT.

<http://www.montana.edu/wwwpb/pubs/mt9816.pdf>