

**Leafy Spurge (*Euphorbia esula*)
Management Plan
for
Northwestern Wisconsin**

Prepared by

Northwoods Weed Initiative

Contributors:

Miles Falck

Great Lakes Indian Fish & Wildlife Commission

Pam Troxell

Sigurd Olson Environmental Institute

Steven Spickerman, Wendy Stein, Mariquita Sheehan

U.S. Forest Service

Michael Gardner

Inland Sea Society

Tom Cogger

Natural Resources Conservation Service

John Markus

UW Extension

Becky Sapper

The Nature Conservancy

Ben Dufford

ABDI Conservation Department

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INTRODUCTION

Conservation of biological diversity is increasingly a national criteria and indicator of sustainable forest management. An ecologically damaging and economically costly challenge to biological integrity of the upper Great Lakes Basin is the spread of non-native invasive species. Recent surveys of the Chequamegon – Nicolet National Forest and surrounding lands have identified the presence of leafy spurge (*Euphorbia esula*). A rapid response has resulted in a renewed collaborative initiative of federal, state, local, tribal and non-profit interests. The common goal of eradication and control of all invasive plant species has evolved out of existing work to control Purple Loosestrife (*Lythrum salicaria*) and restore native plant species to upland and aquatic habitats. The goal of this plan is to control and eradicate (if possible) leafy spurge in northwestern Wisconsin.

It is critical that a first line of defense be established to prevent the spread of leafy spurge to the public lands of the Moquah Barrens and the Northwest Sands landscape. The Northwood's Weed Initiative (Appendix A) will assist the USDA Forest Service and diverse regional partners to establish common goals and actions to protect and restore biological diversity and promote the economic, social and ecological value of healthy ecosystems.

Origin

Leafy spurge is a perennial herb native to Eurasia. It was first recorded in North America from Massachusetts in 1827. It is thought to have arrived in contaminated seed. By the early 1900's, leafy spurge had spread as far west as North Dakota, and has doubled in acreage every 10 years.

Life History

Leafy spurge thrives in open, sunny habitats. The plant reaches heights of up to 1 meter, and the small yellow flower bracts bloom in late May and early June. The seed capsules of leafy spurge open explosively, dispersing seeds up to 15 feet, and are often carried further by water, wildlife, and road maintenance equipment. Leafy spurge also spreads vegetatively, allowing the plant to spread outward and dominate a site. The extensive root system of leafy spurge can penetrate as far as 15 feet underground.

Impacts

Leafy spurge displaces native vegetation in open habitats including prairies, pine barrens,

Pine barrens habitats in northwestern Wisconsin are unique habitats that are especially vulnerable to the threats posed by leafy spurge. The Pine Barrens of northwestern Wisconsin, including the Moquah Barrens of Bayfield County, are a globally endangered natural community. This community is home to unique or rare plants and animals and is threatened by numerous factors including invasive plants. The Barrens, which are located on a glacial outwash of coarse-textured and nutrient-poor sandy soils, are actually a mosaic of closely associated natural communities adapted to relatively frequent disturbance such as fire. These communities include closed-canopy mixed red and white pine forest, mixed dry-mesic pine and hardwood forest, dry jack pine forest, semi-open red pine savanna, and open, prairie-like jack pine barrens. This assemblage of communities, known collectively as the “Northwest Sands” stretches from northeastern Bayfield County south and west through portions of Douglas, Washburn, Burnett, and Polk Counties.

Distribution

GLIFWC has compiled local distribution data for leafy spurge from USFS staff and from field surveys conducted in 2001 (Falck and Garske 2002a). The current distribution is localized around five core populations near Washburn, Iron River, Drummond, Clam Lake, and Highbridge (Figure 1). The Washburn population is the most extensive and poses the greatest threat to adjacent habitat of the Moquah Barrens in the Chequamegon - Nicolet National Forest. The majority of plants are currently restricted to roadside rights-of-way, but populations are encroaching on adjacent private lands in many areas and have completely infested two pastures near Washburn (the largest comprises ~ 6 acres) and one pasture near Highbridge (comprising ~ 9 acres).

Management Priority

GLIFWC staff have compiled a database to help prioritize and guide management activities for over 300 non-native plants known to occur in the Upper Great Lakes region (Falck and Garske 2002b). The database was used to categorize species into four categories of management (Table 1) and prioritize species within categories based on each plant’s relative abundance, ecological impact, and feasibility for control. Using local abundance data from Ashland and Bayfield counties, the database ranks leafy spurge as the highest priority for local control efforts (Table 2). Leafy spurge ranks high because it poses the greatest threat to local habitats, while its relatively low abundance and wide range of control options make it feasible to contain and control.

Table 1. Description of non-native invasive plant management categories (Falck and Garske 2002b).

Category	Number of Species	Description	Management
1	153	“Watch” species that are not present yet but are found in adjacent areas and known to cause ecological impacts.	Emphasis on educational efforts, annual monitoring, and control upon detection.
2	40	Species that cause severe ecological impacts and/or are present in low abundance.	Regional control for select species.
3	40	Species that cause moderate ecological impacts and/or are too abundant to manage on a large scale.	Local control in unique or sensitive areas for select species.
4	79	Species that cause low ecological impacts and/or are too widespread to manage in the absence of biological control.	Biological control for select species.

control options. These audiences will be identified and effectively targeted for educational outreach efforts.

Short Term

Short term objectives include:

- Identify target audiences
- Develop mailing lists
- Alert the public to ongoing activities
- Finalize and present powerpoint presentation to the community
- Seek funding for a coordinator
- Solicit press coverage
- Distribute *Target: Leafy Spurge* brochure in core areas
- Washburn Ecology Club will establish photo points, conduct inventory and monitoring

will also be facilitated to provide hands-on educational opportunities for interested parties.

Long Term

Long term objectives include:

- Establishing a demonstration site to show how leafy spurge can be managed.
- Develop a volunteer monitoring program comprised of local residents, replete with field training days to monitor the spread of leafy spurge.
- Train town employees on the management and actions to take to curb the spread of leafy spurge.
- Increase citizen involvement.
- Develop curricula for local schools.
- Develop interpretive signs that could help reduce the spread of leafy spurge by identifying infestations.
- Secure funding for demonstration washing station for road maintenance equipment.

Accomplishments

- T UW-Extension letter sent to Town of Washburn residents with info on leafy spurge, timing of mowing, and contact info (Spring 2003)
- T Target: Leafy Spurge brochure sent to Town of Washburn residents in Fall 2003
- T Plants Out Of Place brochure reprinted
- T Three biological control organisms released on private lands (June 2003)
- T Three miles of road right-of-way treated with Plateau herbicide by GLIFWC crew (Fall 2003)

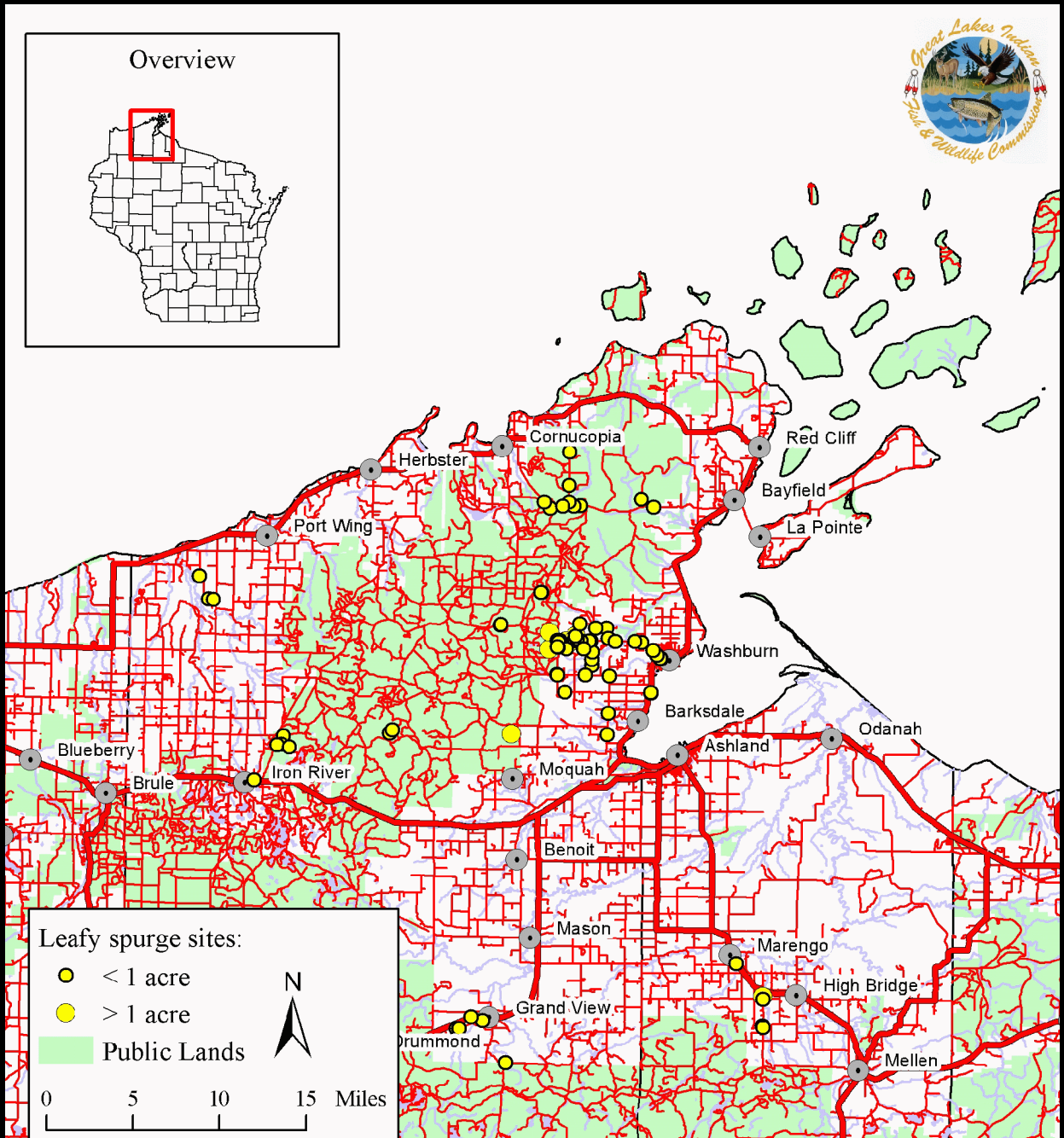


Table 2. Management category 2 species detected in 2001 sorted by management priority (Falck and Garske 2002b) .

Taxon	Common Name	Management Priority	Management Category
<i>Euphorbia esula</i>	Leafy spurge	0.461	2
<i>Euphorbia cyparissias</i>	Cypress spurge	0.277	2
<i>Robinia pseudoacacia</i>	Black locust	0.275	2
<i>Rhamnus cathartica</i>	Common buckthorn	0.258	2
<i>Rhamnus frangula</i>	Glossy buckthorn	0.245	2
<i>Lonicera spp.</i>	European bush honeysuckles	0.242	2
<i>Polygonum sachalinense</i>	Giant knotweed	0.231	2
<i>Vinca minor</i>	Lesser periwinkle	0.216	2
<i>Convallaria majalis</i>	European lily of the valley	0.215	2
<i>Filipendula ulmaria</i>	Queen of the meadow	0.202	2
<i>Berberis thunbergii</i>	Japanese barberry	0.200	2
<i>Linaria dalmatica</i>	Dalmatian toadflax	0.183	2
<i>Centaurea maculosa</i>	Spotted knapweed	0.175	2
<i>Knautia arvensis</i>	Blue buttons	0.164	2
<i>Elaeagnus angustifolia</i>	Russian olive	0.158	2
<i>Elaeagnus umbellata</i>	Autumn olive	0.158	2
<i>Ulmus pumila</i>	Siberian elm	0.129	2
<i>Pastinaca sativa</i>	Wild parsnip	0.125	2
<i>Iris pseudacorus</i>	Yellow flag	0.115	2
<i>Calamagrostis epigejos</i>	Feathertop	0.095	2
<i>Rosa eglanteria</i>	Sweetbriar rose	0.095	2
<i>Ranunculus repens</i>	Creeping buttercup	0.094	2
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	0.094	2
<i>Miscanthus sacchariflorus</i>	Amur silver grass	0.093	2
<i>Caragana arborescens</i>	Siberian pea shrub	0.083	2
<i>Coronilla varia</i>	Crown vetch	0.075	2
<i>Solanum dulcamara</i>	Bittersweet nightshade	0.067	2
<i>Veronica officinalis</i>	Common speedwell	0.061	2
<i>Campanula rapunculoides</i>	Creeping bellflower	0.059	2
<i>Acer platanoides</i>	Norway maple	0.053	2

MANAGEMENT ACTIVITIES

Containment

The first objective to control leafy spurge is to identify the means by which leafy spurge is spreading throughout the project area so that existing populations can be contained. It is probable that road maintenance activities such as mowing and grading are currently spreading seed throughout the project area. Seeds clinging to maintenance equipment and in the tires of passing vehicles have the potential to infest areas far removed from the initial seed source.

A long range objective is to develop an equipment rinsing station for the town garage to remove seeds from maintenance vehicles and equipment. This facility could be used as a demonstration project for neighboring municipalities.

Control

Researchers in the Great Plains states, as well as local studies in southwestern Wisconsin, have amassed a vast body of scientific literature to consult when contemplating control options. The current state of the science suggests that an integrated pest management approach, employing mechanical, biological, and chemical methods provides the most effective control of leafy spurge.

Mechanical Control. Research at Fort McCoy, in Monroe County, Wisconsin, has shown that mowing leafy spurge prior to seed maturation opens the canopy to sunlight, while preventing seed dispersal. The open canopy has been found to increase the effectiveness of biological control agents that favor sunny microhabitats within the spurge patches.

Chemical Control. Additional research at Fort McCoy has shown fall applications of imazapic (Plateau) to be effective for controlling leafy spurge (J. Doll, UW Extension, pers. commun.). Plateau will be applied between 15 September and the first killing frost.

Biological Control. *Aphthona nigriscutis*, *A. lacertosa* and *Oberea erythrocephala* have been approved by USDA-APHIS for release in the United States for biological control of leafy spurge. Research in the Great Plains suggests that these two species provide the most effective control from among the suite of species approved for biological control of leafy spurge. Local collection sites are available at Trempealeau National Wildlife Refuge, in Trempealeau County, Wisconsin and at Fort McCoy in Monroe County, Wisconsin. The beetles are collected and released in June.

project area. Follow-up surveys using similar methods will be required to ensure control efforts are effectively targeted and to monitor progress. Long term monitoring objectives will assess the distribution of leafy spurge throughout the Northwest Sands landscape including Douglas, Washburn, Burnett, and Polk counties.

LITERATURE CITED

- Falck, M. and S. Garske. 2002a. Invasive non-native plant management during 2001. Administrative Report 02-08. Great Lakes Indian Fish and Wildlife Commission, Odanah, WI, USA.
- Falck, M. and S. Garske. 2002b. Invasive non-native plant management during 2002. Administrative Report 02-12. Great Lakes Indian Fish and Wildlife Commission, Odanah, WI, USA.

Appendix A - Northwoods Weed Initiative Fact Sheet

Northwoods Weed Initiative

*An interagency forum to protect the integrity of native ecosystems
in northern Wisconsin and Michigan*

Invasive non-native plants can have devastating impacts on native plant communities, fish and wildlife habitat, agricultural yields, recreational and subsistence opportunities, and ultimately, local economies. Purple loosestrife, leafy spurge, reed canary grass, spotted knapweed, Eurasian water-milfoil, and common buckthorn are examples of invasive non-native plants that negatively impact local natural areas and agricultural lands.

Because these plants disperse widely across the landscape and administrative boundaries, it is advantageous to work cooperatively towards management and control objectives. In addition, the number of new invasives being introduced into local ecosystems continues to outpace control activities, and is too much for any one agency to manage alone.

The present status of the Northwoods Weed Initiative is an informal consultative body with formal partnerships developed on a project specific basis. The Northwoods Weed Initiative provides a forum to share information and collaborate on planning initiatives for invasive plant issues in northern Wisconsin and Michigan.

For more information, please contact:

Steven Spickerman
West Zone Plant Ecologist
Chequamegon-Nicolet National Forest
P.O. Box 126
Glidden, WI 54527
sspickerman@fs.fed.us
(715) 264-2511

Miles Falck
Wildlife Biologist
Great Lakes Indian Fish & Wildlife Commission
P.O. Box 9
Odanah, WI 54861
(715) 682-6619
miles@glifwc.org