

# Purple Loosestrife Control In Voyageurs National Park

By Jim Benedict

Voyageurs National Park was established in 1975 to preserve the outstanding scenery, geological conditions, and waterway system which constituted part of the historic route of the voyageurs who contributed significantly to the opening of the Northwestern United States. Located in northeastern Minnesota along the international boundary with Ontario, Canada, the park is distinct from the adjacent Boundary Waters Canoe Area Wilderness (BWCAW) in that motorized recreation, (e.g. motorboating and snowmobiling) are permitted in Voyageurs but not in the BWCAW.

Resource management and research at Voyageurs NP are designed to maintain, protect and restore the integrity of the park's natural ecosystem and ecological processes. The principles and techniques of restoration ecology are being used to restore the integrity of park resources to the extent practical and feasible. Implementation of these programs would be impossible without the cooperation and support of numerous federal, state, provincial and local agencies, organized groups, and private citizens.

A survey for purple loosestrife (*Lythrum salicaria*) in the park in August 1987 and June and August 1988 revealed scattered pockets of this exotic weed along the west shoreline of Kabetogama Lake. About 60 acres of wetlands are currently affected. Most affected sites are accessible only by boat and contain populations densities from 100 to greater than 100,000 plants per acre. If we fail to control these scattered, isolated weed populations in the next few growing seasons, they could foreseeably become widespread in the park and impossible to control or limit.

Purple loosestrife is an erect, herbaceous perennial of Eurasian origin. Introduced to North America in the early 1800s, it now poses a serious threat to native emergent vegetation and associated wildlife in shallow-water marshes throughout the northeastern and northcentral states. In Minnesota, this phenomenally prolific exotic has spread to more than 800 sites. Over 20,000 acres of wetlands now are covered with loosestrife. Because of its exotic origin, it has left behind all of its natural enemies and predators and multiplies with no checks and balances in North America. Loosestrife crowds out undisturbed native wetland vegetation, such as cattails, bulrushes, reeds and sedges, that are required by fish and wildlife for food, shelter and breeding, while having little forage value itself for fish and wildlife.

A coalition of Minnesota government agencies and conservation organizations (The Purple Loosestrife Coalition, Minnesota Trappers Association, Minnesota Waterfowl Association, and Pheasants Forever) has initiated a loosestrife control program in Minnesota. In 1987, purple loosestrife was designated a noxious weed in Minnesota by the commissioner of agriculture. In 1988, the commissioner designated wand lythrum (*Lythrum virgatum*) and winged loosestrife (*Lythrum alatum*) and any combinations thereof to be noxious weeds. This action was taken because identification of *Lythrum* hybrids and cultivars is very difficult if not impossible. The noxious weed law and 1988 order prohibit the sale and transport of all these plants in Minnesota.

The Minnesota Departments of Natural Resources (MDNR) and Agriculture (MNDA) are the two lead



Purple loosestrife control in Voyageurs NP, MN.

agencies responsible for coordinating loosestrife control efforts throughout the state. Voyageurs NP has been working with these and other state and county agencies, groups, and private citizens to control park loosestrife populations and to make areawide control actions more effective. Control work and permitting for loosestrife control are being coordinated among landowners in the Kabetogama Lake area.

## NPS Management Policy on Exotic Plants and Action Threshold

The NPS defines exotic species as those that occur in a given place, area, or region as the result of direct or indirect, deliberate or accidental introduction of the species by humans. Exotic species, such as purple loosestrife, in Voyageurs NP are of special management concern because: (1) when they invade and displace native plant and animal species they could alter park successional processes, community productivity, diversity and stability; (2) they represent deviations from natural ecosystem conditions present during the era of the voyageurs; and (3) their presence provides the visitor with a skewed impression of the park's natural vegetation and wildlife.

Management of populations of exotic plants, up to and including eradication, will be undertaken wherever such species threaten park resources or public health and when control is prudent and feasible. The presence of one individual plant growing anywhere in the park is an unacceptable risk to Voyageurs' natural resources. The threshold for control action in Voyageurs' is, therefore, the presence of one individual plant in the park.

## Implementing the Control Program

Methods for eradicating large, dense populations of loosestrife are not currently available. The most effective and efficient control strategy at this time is to quarantine loosestrife to sites already severely infested by: (1) monitoring wetlands that do not currently have loosestrife to ensure that any invasion is detected early and removing any discovered seed sources; (2) eradicating small populations in wetlands that are not severely infested; and (3) removing plants around the edges of severe infestations to prevent

further spread of the patch. A number of control or eradication methods have been tested: doing nothing, pulling and digging, cutting, burning, flooding, and broadcast and spot spraying with various herbicides.

Since August of 1988, we have been controlling purple loosestrife in Voyageurs by annually spot spraying individual plants of high density populations (from 10 to greater than 1000 plants per acre) twice between late June and early August with SEE-2,4-D, an aquatic herbicide which is not lethal to all wetland plants. Great care is taken to treat only the loosestrife and avoid spraying associated wetland plants, such as cattails, bulrushes, sedges, willows and alders.

To prevent regeneration, any flower stalks remaining after early August are cut and bagged, removed from the wetland, and burned. Treatment areas are posted as closed to swimming and fishing for three days after spraying. In low density populations, with young plants (less than 10 plants per acre) and localized areas where herbicide use may be restricted for public health reasons, we annually control loosestrife using non-chemical control methods, primarily pulling and digging of individual plants. Wetlands that do not currently have loosestrife are monitored to ensure that any invasion is detected early. The control program effectiveness is monitored annually.

To date, the most effective and least costly method for controlling loosestrife where the plants cannot be pulled, is with spot applications of herbicide. The aquatic herbicide SEE-2,4-D effectively kills purple loosestrife while not posing a threat to public health. SEE-2,4-D is biodegradable and very short-lived, quickly inactivated when it contacts moist soil. SEE-2,4-D is approved by the U.S. Environmental Protection Agency and the Minnesota Department of Natural Resources for use over open water, such as wetlands. Spot application allows effective use of the herbicide with little or no damage to desirable perennial plants. SEE-2,4-D is taken up through leaves or young stems and will kill any herbaceous, broadleaved plant that it contacts on these tissues. This makes it important to treat only the loosestrife and avoid damaging the desirable perennials. If this can be accomplished, most of the loosestrife will be removed and the relatively small "holes" in the vegetation will quickly fill with other perennials.

Follow-up treatment with SEE-2,4-D for at least three or four more seasons will be necessary to take care of missed plants, new seedlings that will germinate, the roots of many older plants that will survive and resprout, and seed transported to the park by wind, water and wildlife from infested areas inside and outside of the park. Some level of control action using herbicides will be required on an annual basis thereafter for the foreseeable future. If we can prevent the park's loosestrife plants from setting and dispersing any more seed, we will gradually use up all the seed stored in the soil. Over time, therefore, we should see a dramatic reduction in the areal extent of the infestation.

As the park's purple loosestrife populations develop resistance to SEE-2,4-D, another selected broadleaf herbicide approved for use in aquatic environments will be used to control loosestrife for several years. At that time, we may switch back to using SEE-2,4-D or another approved herbicide. We can hope that a biological control agent for loosestrife will be found by the

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time resistance becomes a concern.

Our monitoring the effectiveness of herbicide control on loosestrife and associated native wetland vegetation within the park involves permanent plots that are rephotographed each year. Photographs were taken in August 1988 prior to and after treatment and each August thereafter at Kecs Kove and Rantas Bay.

Since August of 1988, we have sprayed all loosestrife stands in the park and vicinity three times. Although the areal extent of the infestation is unchanged, we have reduced the density of plants by 95 percent in the park's wetlands. The age structure of these stands also has been altered dramatically.

Instead of flowering plants that are three to six years old, the vast majority of flowering plants during the third spraying were one year old. By spraying twice a summer, until the seed source is used up, we will be able to prevent loosestrife from setting and disseminating any seed in these infested areas. As loosestrife's seed-bank becomes exhausted, we should see a dramatic reduction in the areal extent of the infestation, as well.

For more detailed information about our program, a copy of the park's Purple Loosestrife Control Plan may be had by calling (218) 283-9821 or FTS 780-5466.

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