

**DETERMINATION OF IMPAIRMENT
GREAT LAKES INVASIVE PLANT MANAGEMENT PLAN / ENVIRONMENTAL ASSESSMENT
NATIONAL PARK SERVICE MIDWEST REGION**

In addition to determining the environmental consequences of the alternatives, *NPS Management Policies 2006* and DO-12 require an analysis of potential effects to determine if actions would impair park resources. The fundamental purpose of the national park system established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park and monument resources and values. However, the laws give NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute an impairment of the affected resources and values. Although Congress has given NPS management discretion to allow certain impacts within parks, that discretion is limited by statutory requirements that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. However, an impact would more likely constitute impairment to the extent it affects a resource or value whose conservation is:

- necessary to fulfill specific park purposes identified in the establishment, legislation or proclamation of the park;
- key to the natural and cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values, and it cannot be further mitigated. Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside of the park. An impairment determination is not made for visitor experience/recreational values, socioeconomic values, or park operations as these impact areas are not generally considered park resources or values according to the Organic Act and cannot be impaired in the same way that an action can impair park resources and values.

Based on the aforementioned guidelines and basis for determining impairment of park resources and values, a determination of impairment is made for each of the resource impact topics carried forward and analyzed in the environmental assessment for the Preferred Alternative.

General Vegetation

Vegetation within and between the parks is variable and is influenced by landscape, elevation, and proximity to lacustrine, riverine, and palustrine environments. The following sections describe the general vegetation communities occurring in IATR, MISS, and SACN, where this impact topic has been

carried forward for analysis. Management actions in these locations will not cause impairment, but they will reduce the threat of impairment caused by invasive plant species.

Ice Age National Scenic Trail

The Cross Plains Unit of the Ice Age National Scientific Reserve falls within three of these ecological landscapes; Western Coulee and Ridges, Central Sand Hills, and Southeast Glacial Plains (NPS 2011a). The Ice Age Complex Cross Plains Unit includes scattered closed-canopy red and white oak and sugar maple groves, and bur oak groves on south- and west-facing ridges. Remnant floral communities at the complex include southern mesic forest in ravines and drainages, overgrown oak savannas, and dry mesic prairie on ridges and hillsides (NPS 2011a).

The Ice Age Complex also contains lands under active farming and old agricultural fields as well as wetlands at the US Fish and Wildlife Shoveler Sink freshwater emergent wetland site, Coyle Pond freshwater emergent wetland and freshwater pond site, and other small freshwater emergent wetland areas on the north and west edges of the Complex (Pers. Comm. with Mark Holden (NPS 2011b)).

Mississippi National River and Recreation Area

The hardwood forests in MISS are dominated by hardwood trees such as ash, bur oak, and sugar and silver maples. There is also the potential for evergreens to occur in locations having poorer soils, such as rock outcroppings and wetlands. Wildflower species include spring ephemerals that typically bloom before the trees begin leafing out each spring. Later blooming wildflowers are generally found at the forest edge and in openings where sunlight reaches the forest floor (NPS 2011).

Historically, MISS was dominated by open prairie and savanna ecosystems covered mainly by oak, woodlands, and various species of woody shrubs. Other vegetation types in MISS included floodplain forest, upland prairie, and maple basswood forest (NPS 1988). Urbanization and use of the area have altered the vegetation composition of the river corridor and surrounding landscape. Land cover data derived from 1988 satellite imagery identified 28 percent of the corridor as developed (NPS 1988).

St. Croix National Scenic River

Terrestrial vegetation communities along the St. Croix and Namekagon Rivers transition from northern mixed hardwood forests in the northern reaches, through red, white, and jack pine forests in the north-central regions, and emerge as a northern mixed hardwood and river floodplain forest complex in the middle and southern reaches of the river. The south and southwest facing slopes in the lower reaches also contain grasslands which have been described as sand prairie, basalt bald prairie, and hill prairie. Mesic-wet prairie vegetation is common on islands and adjacent uplands subjected to periodic flooding. These intergrade with the wetlands that include peatland, bog, wet meadow, and fen habitats. These habitats support a thriving community of aquatic and wetland vegetation throughout the Riverway.

Under the Preferred Alternative, priority for invasive plant management would be given to the stewardship of fundamental and/or significant resources and values through management of plant species that alter the desired resource condition. Implementation of Alternative 2 would primarily have a moderate, direct, beneficial, long-term, and localized effect on native vegetation by providing IATR, MISS, and SACN the ability to use a suite of treatment options to remove existing invasive plants, and

help prevent future infestations. Potential adverse impacts on native vegetation under the preferred alternative include the minor potential for over-spray of pesticides onto native plants. Invasive plant treatments under the preferred alternative would have a beneficial cumulative effect on maintaining/restoring native vegetation when combined with other past, present, and reasonably foreseeable restoration activities.

Mitigation measures to reduce negative impacts to general vegetation have been described in the FONSI. Impairment to these resources would not occur.

Rare or Unusual Vegetation

Rare and unusual vegetation includes old growth forest, riparian, alpine, and wetlands. The following sections describe the rare and unusual vegetation occurring in INDU, PIRO, SLBE, and VOYA, where this impact topic has been carried forward for analysis. Management actions in these locations will not cause impairment, but they will reduce the threat of impairment caused by invasive plant species.

Indiana Dunes National Lakeshore

The varied topographical features provide areas for rare or unique vegetation communities that contain habitat for sensitive plant and wildlife species. Three such unique communities found in INDU include peat based wetland, free moving dunal systems, and black oak savanna (NPS 1998). Each of these unique ecosystems provides habitat for numerous sensitive species: the peat wetlands provide habitat for the pitcher plant species; the dunal system provides habitat for the Pitcher's thistle, and oak savanna provides habitat for the Karner blue butterfly. These species are discussed in detail in the sensitive species section of the IPMP/EA.

Increased numbers of exotic plants negatively impact growing conditions for rare plants and the Karner blue butterfly's sole larval food source, wild lupine. A survey for non-native plant populations revealed that areas supporting Karner blue butterfly populations are impacted by buckthorn black locust, tree of heaven, non-native honeysuckle, bristly locust, multiflora rose, garlic mustard, Oriental bittersweet, cattail, Phragmites, reed canary grass, purple loosestrife, and autumn olive. Many of these non-native plant species impact the Karner blue butterfly by reducing the abundance of wild lupine and nectaries of adults. Furthermore, one of the trees targeted for treatment, black locust, is allelopathic and suppresses the growth of native vegetation (NPS – INDU Invasive Species Plant Management Strategy).

Pictured Rocks National Lakeshore

The NPS's State of Our Parks Report describes PIRO as being located within the transition zone between the boreal and eastern deciduous forest, supporting diverse habitats including:

1. Mesic deciduous forests,
2. Hydric forests and swamps,
3. Wetlands,
4. Lakes and ponds,
5. Xeric coniferous forests,
6. Sand dunes and beaches, and
7. Sandstone cliffs.

One of the more unique ecosystems at PIRO is its sand dunes and sandscapes, which include the Grand Sable Dunes. Many of the species of concern identified at PIRO, including Pitcher's thistle, are found in the Grand Sable Dunes Research Natural Area (RNA); others are found in various habitats throughout the National Lakeshore (NPS 2005b). Grand Sable Dunes is a designated RNA under NPS policies because the area contains many rare plants. Few such undeveloped dunes remain in the Great Lakes area. RNAs are established for areas that are prime examples of natural ecosystems and areas with significant genetic resources with value for long-term baseline observational studies or as control areas for comparative studies in other areas. The Grand Sable Dunes are also designated as a Critical Dune Area by the Michigan Department of Environmental Quality. This designation identifies the dunes as an environmental area warranting protection under the Michigan Coastal Management Program (NPS 2005b).

Non-native plants that are of the most concern at PIRO include spotted knapweed, white sweet clover, red clover, burdock, periwinkle, and several hawkweed species. The shifting sands of the park's dunes are attractive habitat for spotted knapweed, a superior competitor that invades highly disturbed areas. Park staff manages spotted knapweed by containing the larger populations through chemical treatment and physically removing smaller infestations without the use of chemicals. This strategy helps protect native species such as Pitcher's thistle and Lake Huron tansy, both species listed as threatened in the state of Michigan. PIRO has a program in place to contain invasive plants and a system for monitoring the success of this program. By periodically mapping invasive plant coverage within the 1,976-acre dune ecosystem, park staff has the ability to monitor changes (NPCS 2007).

Sleeping Bear Dunes National Lakeshore

While the dunes may be the most well-known natural environment of Sleeping Bear, the lakeshore also supports several different habitat types including forests, wetlands, riverine systems, lacustrine systems, open fields, and lakes. Many of these habitats support species of concern. Beach ridge and swale formations provide an intricate transition between upland and wetland habitats, with excellent examples at Platte Bay, Good Harbor Bay, and the crescent-shaped bay of South Manitou Island. White pine, red pine, and jack pine along with northern pin oak dominate the beach ridges, while wetland vegetation, including herbaceous, shrub, and tree species, dominate the beech swales. Further inland, hardwood forests span the landscape, which are dominated by sugar maple and American beech, along with white ash, American basswood, and yellow birch. Remnant farms and old-field meadows from past agricultural practices break up the forested landscape.

At least 150 exotic or invasive plants or noxious weeds have been identified at SLBE. Spotted knapweed, baby's breath, bull thistle, blue lyme grass, bladder campion, hoary alyssum, and Lombardy poplar have extensive, established populations in the open dune habitat that supports a number of sensitive species including the endangered piping plover and the threatened Pitcher's thistle among others (NPS 2008).

Voyageurs National Park

The *Voyageurs National Park General Management Plan, Environmental Impact Statement and Visitor Use and Facilities Plan* (NPS 2001) describes VOYA as being composed of a mosaic of land and water, a place of interconnected waterways that flow west into the Rainy River, and eventually north as part of the arctic watershed of Hudson's Bay. The park is a place of transition, between upland and aquatic ecosystems, southern boreal and northern hardwoods forest types, and both wild and developed areas

(NPS 2011b). Lake levels in the VOYA's large lakes have been regulated by a hydroelectric dam on Rainy Lake and regulatory dams on Namakan Lake since the early 1900s (NPS 2005c).

Information on the rare and unusual vegetation resources presented here is taken directly from the *Voyageurs National Park General Management Plan, Environmental Impact Statement and Visitor Use and Facilities Plan* (NPS 2001). VOYA includes natural features such as bogs, marshes, swamp forests, and wetlands that support rare and unusual vegetation. These features are abundant in the Border Lakes area; however, they are not as common as upland forests. In the park about 20,000 to 27,000 acres are considered wetlands. The park's wetlands are important communities for several reasons. They have the greatest diversity of plant and animal species of any vegetative assemblage; most of the park's unusual or unique vegetative communities are wetland communities; and with few exceptions all rare or protected plant species in the park occur in wet or low lying areas. Minnesota's peatlands (swamp forests, bogs, and fens) are also significant simply for their extent — over 6 million acres and more than any other state except Alaska. Examples of unique wetland communities in the park include leatherleaf/sweet gale shore fens, northern bur oak mesic forests, white cedar/mixed conifer or tamarack swamps, and wild rice marshes (NPS 2001).

Interfaces between land and lakes are some of the most diverse, dynamic, and complex habitats in the park. Marsh vegetation in the park is most abundant at the edge of lakes. Marsh and shoreline (or littoral) vegetation, which occurs from the shore to depths where light still penetrates to the bottom, are used by many species of fish, birds, and other wildlife to live and rear young (NPS 2001).

Narrow-leaved cattail is widely distributed in eastern and central North America in wetlands, shorelines and ditches and other disturbed wet areas. Where it has invaded, it often out-competes native vegetation to form dense, pure stands. Narrow-leaved cattail hybridizes with common cattail (*T. latifolia*) to form *T. glauca*, an even more competitive form. In VOYA, narrow-leaved cattail forms extensive monocultures on Kabetogama Lake shorelines. Scattered other occurrences, consisting of smaller stands, are found on Namakan and Rainy Lake. Cattails produce enormous quantities of fruit in a single inflorescence (up to 700,000) that is easily transported long distance by wind. Proliferation of dense cattail colonies can reduce species diversity by closing open water and eliminating habitat for wildlife and native plant species.

The Preferred Alternative would have a moderate, indirect, beneficial, long-term, and localized effect on rare and unusual vegetation by providing INDU, PIRO, SLBE, and VOYA with a suite of treatment options for the control and prevention of invasive plant species. Combined with existing and future invasive plant management actions, the preferred alternative would have a beneficial cumulative effect on rare or unusual vegetation in the Great Lakes region. Mitigation measures to prevent impairment to rare or unusual vegetation have been described in the FONSI. Impairment to these resources would not occur.

Species of Special Concern Including Potential/Critical Habitat

The rationale for determining whether or not a species of special concern has the potential to be impacted by treatment options in the IPMP/EA was consistent with that used to identify impact topics in the Environmental Screening Form, and only those species where the effect of the IPMP is expected to be moderate, regional, long-term, or large-scale were carried forward for full analysis. Management actions in these locations will not cause impairment, but they will reduce the threat of impairment caused by invasive plant species.

Apostle Islands National Lakeshore

Piping Plover (Charadrius melodus)

Long Island is the only location in Wisconsin where piping plovers have recently nested successfully. From 1998 to 2005, nesting was sporadic, but in 2006, the park had four nests; three on Long Island and, for the first time, one on Outer island. All three nests on Long Island successfully produced young, but the nest on Outer Island was unsuccessful as of 2001. Long Island and the Michigan Island sandscapes are designated critical habitats for piping plover (NPCS 2007).

Indiana Dunes National Lakeshore

Indiana Dunes National Lakeshore provides important habitat for federally and state listed species and is specifically directed through federal law and NPS policy to protect these species and their habitats. There are four federally and/or state listed animal species found in and around INDU, including:

Eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*),
Pitcher's thistle (*Cirsium pitcheri*),
Pitcher-plant (*Sarracenia purpurea*), and
Karner blue butterfly (*Lycaeides melissa samuelis*).

Isle Royale National Park

The sensitive plant species that occur on ISRO fall within a variety of plant families, with the most highly represented family being the orchid family. Some of the special status plant species on the island include:

Isle Royale ragwort (*Packera insulae-regalis*),
Devil's club (*Oplopanax horridus*), and
Mountain cranberry (*Vaccinium vitis-idaea*).

Compared to many mainland locations, invasive species on ISRO are relatively sparse; only 15 percent of the plants are non-native. Therefore, the plant and animal communities on ISRO may be less susceptible to the processes of biotic homogenization that plague many other areas of the region (NPS 2009).

Pictured Rocks National Lakeshore

Pitcher's thistle (Cirsium pitcheri)

Pictured Rocks National Lakeshore supports habitat for and populations of Pitcher's thistle. Grand Sable Dunes of PIRO is one of only two U.S. populations of the federally threatened Pitcher's thistle on Lake Superior.

Sleeping Bear Dunes National Lakeshore

Sleeping Bear Dunes provides suitable habitat for numerous unique (non-listed) plant and animal species, in addition to listed species:

- Pitcher's thistle (*Cirsium pitcheri*),
- Piping plover (*Charadrius melodus*), and
- Michigan monkey-flower (*Mimulus michiganensis*).

In general, the Preferred Alternative would have moderate, long-term, localized, beneficial, indirect and cumulative effects on special status species in APIS, INDU, ISRO, PIRO, and SLBE. Therefore, implementation may affect but is not likely to adversely affect the species.

Mitigation measures to reduce negative impacts to species of special concern have been described in the FONSI. Impairment to these resources would not occur.

Unique ecosystems [e.g., National Natural Landmarks (NNLs), Maritime Cliffs, Biosphere Reserves, World Heritage Sites]

While there are many unique ecosystems within the Great Lakes national parks, only one (i.e., the NNLs within INDU) was determined to be affected to a regional and/or long-term effect from the Great Lakes IPMP. Management actions in these locations will not cause impairment, but they will reduce the threat of impairment caused by invasive plant species.

Indiana Dunes National Lakeshore

Natural features represented include bogs, fens, marshes, and dune systems along Lake Michigan. The sites in Indiana received NNL designation between 1965 and 1986. Sites range in size from 28 acres to over 1,500 acres, and are owned by a variety of landowners including U.S. Forest Service, NPS, Indiana Department of Natural Resources (INDR), Purdue University, non-profit land trusts, Evansville City Parks, The Nature Conservancy, and private individuals (NPS 2011b).

The Indiana Dunes Lakeshore, including the Indiana Dunes State Park, contains the following four Registered NNLs (NPS 1998):

- Dunes Nature Preserve NNL
- Pinhook Bog NNL
- Cowles Bog NNL
- Hoosier Prairie State Nature Preserve NNL

The Preferred Alternative would have a moderate, indirect, beneficial, long-term, and localized effect on dunal and wetland habitats by providing INDU with a suite of treatment options for the control and prevention of invasive plant species. When combined with other past, present and reasonably foreseeable restoration activities, by helping restore the natural function of dunal and wetland systems within INDU's NNLs, invasive plant treatment would contribute towards achieving the goals of the NNL Program and would therefore, result in a beneficial cumulative impact on unique ecosystems.

Mitigation measures to reduce negative impacts to unique ecosystems have been described in the FONSI. Impairment to these resources would not occur.