Phragmites

— and the rare plants, animals and natural communities along Michigan's northern coasts

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- Michigan Department of Natural Resources—Wildlife Division
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- United States Fish and Wildlife Service

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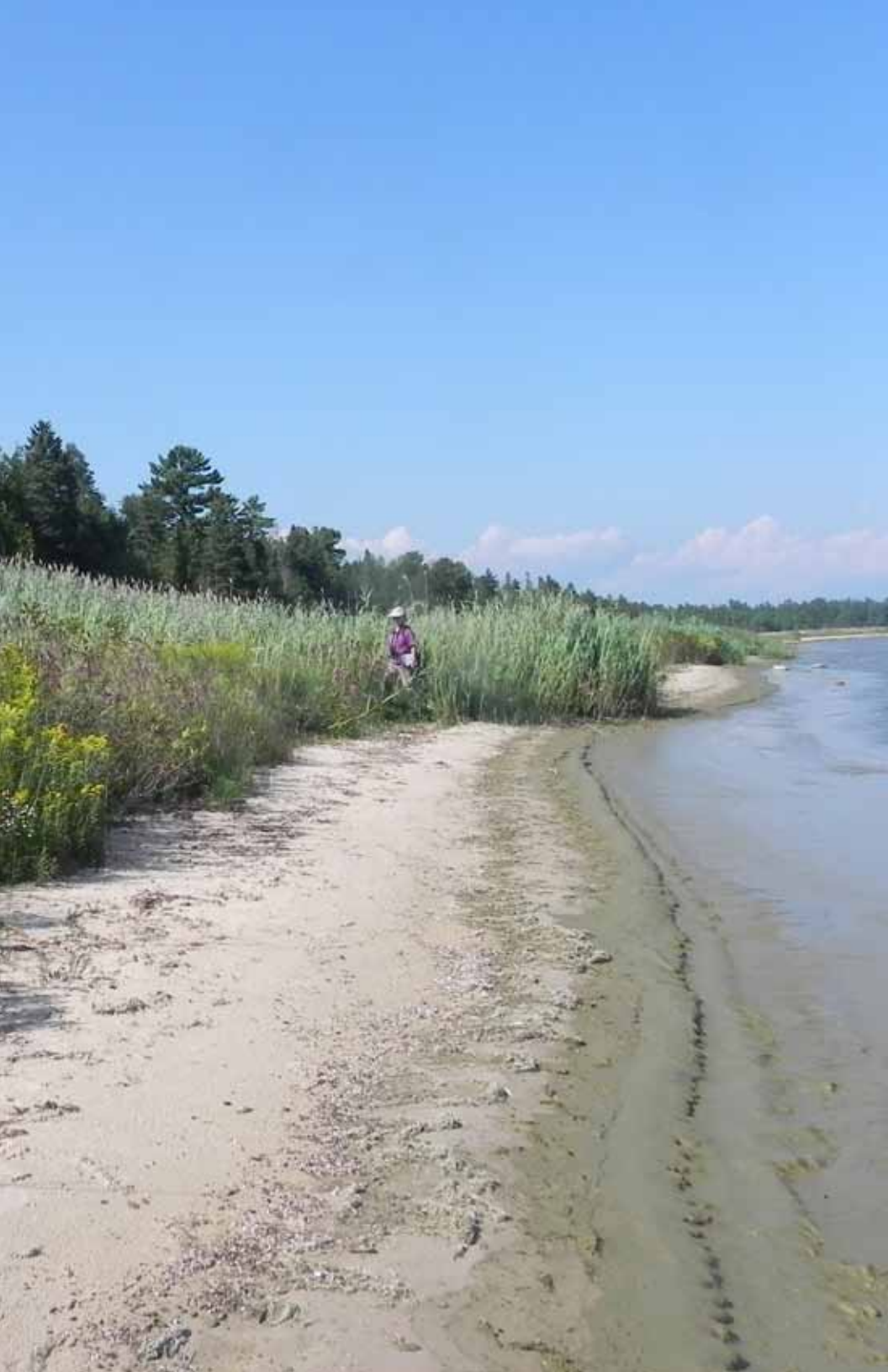
2010
Michigan Natural Features Inventory

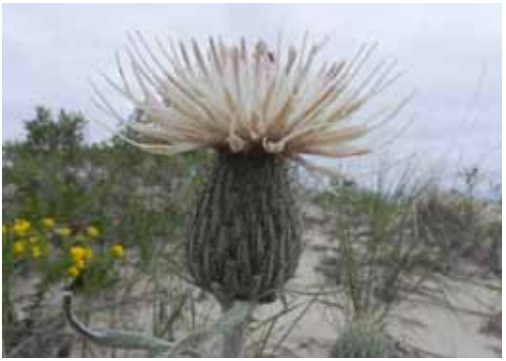
Contents



Overview

Value of Coastal Areas

Michigan's coastal beaches, dunes and diverse wetlands are exceptionally rich, harboring seven federally listed species, along with 15 distinctive community types and forty state endangered, threatened, and special concern species. These coastal communities are critically important to migratory birds, near shore fish spawning and rearing, waterfowl hunting, and sport fishing.



Pitcher's thistle

With over 3,000 miles of Great Lakes shoreline, Michigan is particularly vulnerable to the impacts of wetland and aquatic invasive species. In particular, the invasion of non-native phragmites (*Phragmites australis*) poses one of the greatest threats to coastal wetlands and shorelines in the Great Lakes region. Early detection of non-native phragmites and a rapid response in controlling it is one of the most proactive and cost effective actions that can be taken to conserve the rare species of Michigan's coastal zone.

Federally listed species in Michigan's Coastal Zone

Piping plover (Endangered)
Hine's emerald dragonfly (Endangered)
Houghton's goldenrod (Threatened)
Michigan monkey-flower (Endangered)
Pitcher's thistle (Threatened)
Lakeside daisy (Endangered)
Dwarf-lake iris (Threatened)

In 2009, a collaborative effort to detect and treat invasive phragmites was initiated along Michigan's northern coasts. In partnership with MDNR, MDEQ, and many local entities including townships, Conservation Districts, State Parks, watershed councils, land conservancies, lake associations and citizens, Michigan Natural Features Inventory (MNFI):

- prioritized sites with respect to rare plants, animals and natural communities;
- conducted surveys for phragmites over 500 miles of shoreline;
- conducted workshops for local officials, stakeholders and contractors;
- coordinated treatment with local stakeholders and DNRE staff;
- developed resource materials including maps, PowerPoint presentations, brochures, and guidelines for herbicide use around rare animals.

The project is supported by MDNR-Wildlife Division, the U.S. Fish and Wildlife Service and the National Fish and Wildlife Foundation.

Controlling and/or Eradicating Non-native Phragmites

A number of different control techniques have been utilized to combat phragmites with varying degrees of success; digging, mowing, burning, flooding, grazing, and treatment with several different herbicides. Although many prefer to avoid the use of chemicals, herbicides currently provide the most effective primary method of control, particularly when coupled with non-chemical methods that will further stress the plant.

Because phragmites has deep and extensive root systems, digging is not effective except for the very smallest infestations. Mowing early in the season will actually increase stand density, although later in the season, it can help deplete energy reserves. Flooding cut stems can be effective but is not feasible in many settings. Prescribed fire can increase the growth and vigor of phragmites but is a useful tool in conjunction with herbicide, as it clears away thatch and allows the seed bank to respond.

One or more permits from the Department of Environmental Quality are typically required to treat phragmites with herbicide. Information on permits and other resources can be found at the links below. Phragmites control is a long-term endeavor; any treatment plan should include provisions for long-term monitoring and re-treatment of new shoots as needed.

Resources

Control and Management of Invasive Phragmites - MDEQ website:
http://www.michigan.gov/deq/0,1607,7-135-3313_3681_3710-178183--,00.html

Two particularly helpful publications are available at this website:

Information for Resource and Land Managers - A Guide to the Control and Management of Invasive Phragmites

Information for Landowners - A Landowner's Guide to Phragmites Control

For hard copies of the second brochure contact the Office of the Great Lakes at: 517-335-4056.

Catching it early

Since treating invasive phragmites early is easiest, likeliest to result in eradication and most cost effective, it is imperative to catch it just as it begins to invade. Unfortunately, this is when it most resembles the native. In planning control efforts, it is critical to first determine that the population in question is actually the invasive subspecies. Non-native phragmites can appear sparse while it is just beginning to invade, but a few characteristics can help to distinguish it from the native.

Recognizing invasive Non-native Phragmites

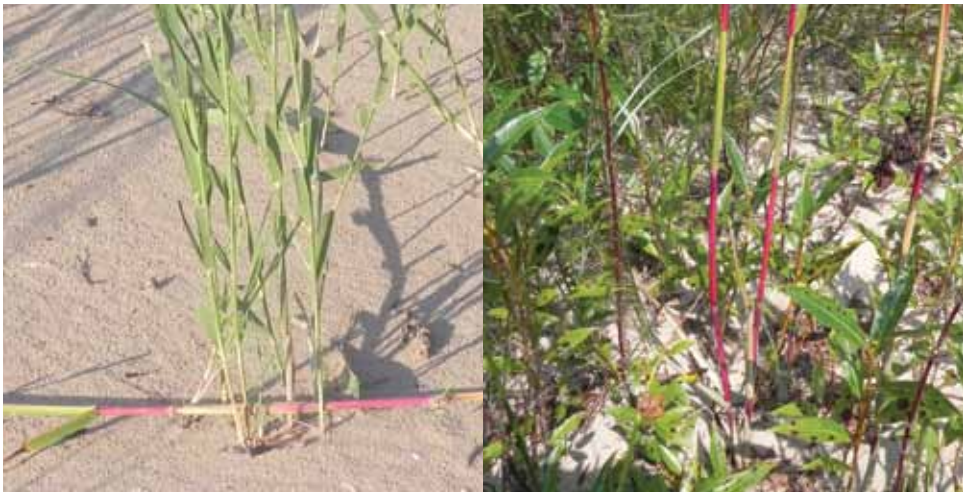
Although phragmites is best known as a wetland invader, not all phragmites is invasive. Two subspecies are recognized in Michigan; *Phragmites australis* subsp. *australis*, sometimes known as Haplotype M, was introduced to the east coast by the early 1800s and has been gradually expanding its range westward. It forms dense monocultures and is capable of dominating wetlands within a few years.

The native subspecies, *Phragmites australis* subsp. *americanus*, in contrast, occurs as scattered plants within broader plant communities. It is a component of several wetland communities including Great Lakes marsh, coastal fen and sedge meadows, and is often found along the shores of rivers and lakes.

Differences are most obvious when the two subspecies are side by side; leaf color is subtly different and the bright red stems of the native are distinctive. Leaf sheaths of non-native phragmites cling tightly, covering dull tan stems with tiny ridges. The lower leaf sheaths of native phragmites fall off easily, exposing the stem below, which turns red in the sunlight.

The non-native subspecies has stolons (spreading horizontal stems) that can grow up to 50 ft or more in a season. Unlike the upright stems, they can be quite red.

Non-native **Native**



Generally the non-native form emerges earlier in the season and continues to grow later in the fall. It is considerably more robust and grows in dense colonies.

While it is just beginning to invade and is still relatively sparse, the non-native subspecies may be mistaken for the native. Similarly, in areas with nutrient enrichment, the native form may grow taller and more densely. With practice, the two subspecies can be distinguished. Recently, hybrids have been reported in the literature but they appear to be relatively uncommon.

More information on distinguishing the two subspecies is available online at: *http://web4.msue.msu.edu/mnfi/phragmites/native-or-not.cfm*

Planning a control effort in the Coastal Zone

When prioritizing areas for treatment, consider protecting high quality natural communities and those areas with threatened and endangered species before areas that do not have the same ecological significance.

- Work first in newly invaded sites
- Then treat areas that are moderately invaded
- Finally, treat areas with extensive invasion

Make sure that resources for long-term monitoring and spot treatment are available before initiating control efforts on particularly degraded sites. A successful control effort begins with a well-thought out plan of attack. Elements of a plan should include:

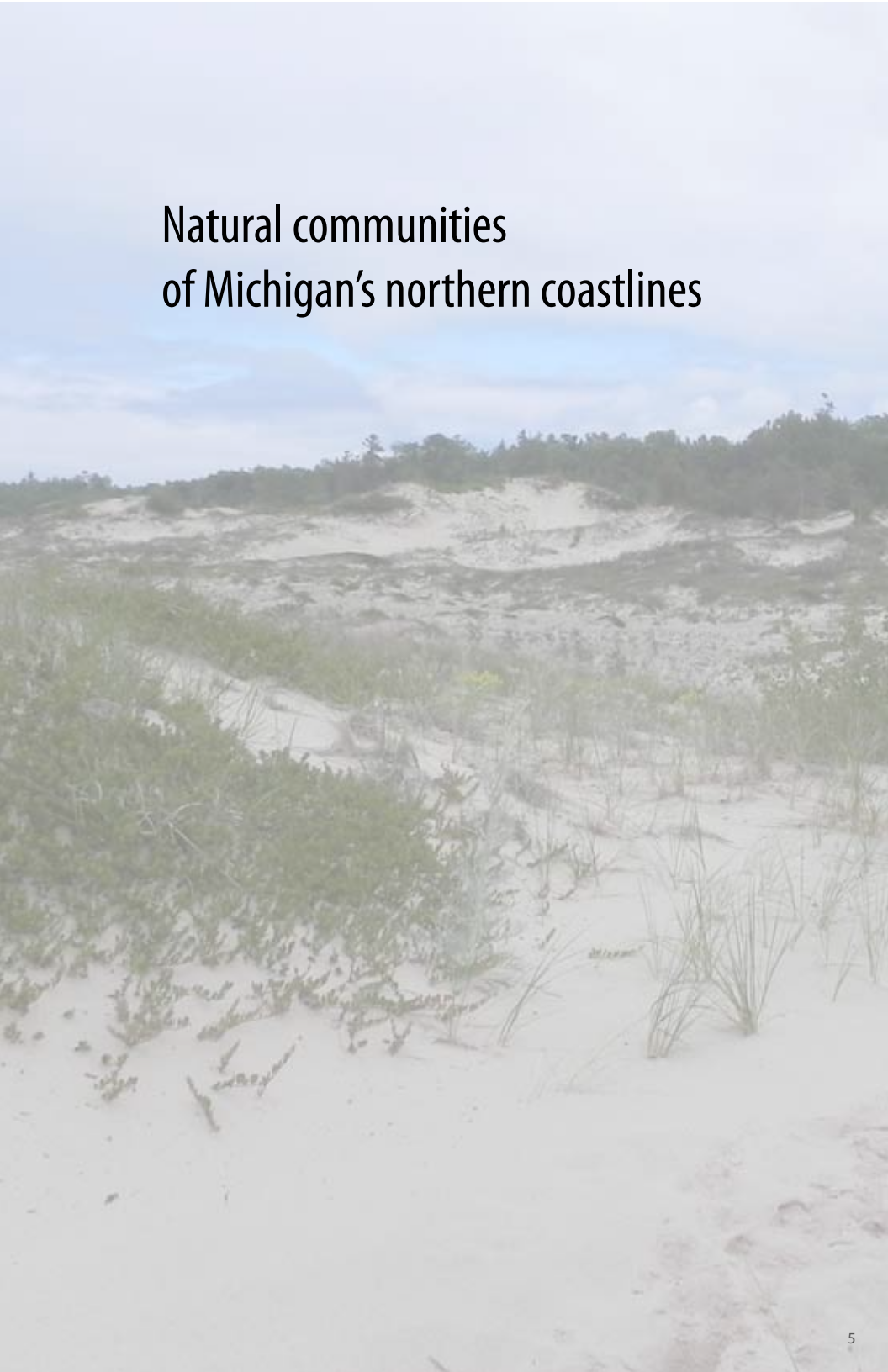
- A map of the phragmites in the area; note age and density of stands, and identify of any native stands
- An inventory of any high value features, including rare plants, animals or communities that may require special protection
- An inventory of site conditions, include sources of nutrient or road salt run-off, fill dirt, and other invasive species that might be targeted simultaneously
- Coordination with other landowners
- Treatment plan, including techniques to be used, herbicide, any adjuvants, timing, etc.
- Ideally, some method for removing dead phragmites, whether by prescribed fire or mowing
- A monitoring plan
- Designated resources for treatment of any resprouts or new infestations

It is important to determine whether any of the state endangered, threatened or special concern species occur in the area you plan to treat and to take appropriate measures to avoid negative impacts to these species. You may consult Michigan Natural Features Inventory for assistance.

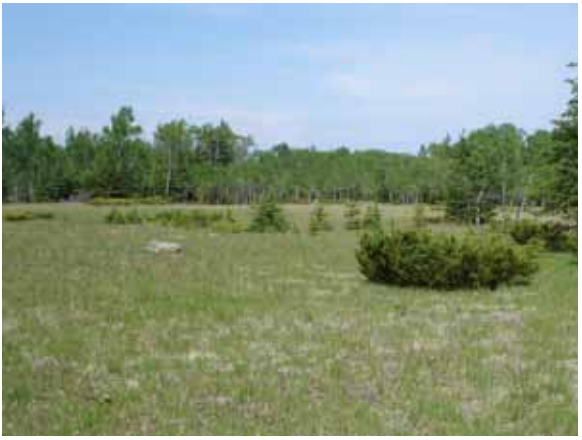
If rare plants occur in areas with non-native phragmites, use appropriate measures to protect these plants from the potential negative impacts of the treatment. Generally, hand-swiping is safer than spraying herbicide in these situations, and glyphosate based products are less mobile in the soil than imazapyr.

Many animals are also vulnerable to activities associated with the treatment of non-native phragmites (i.e. herbicide use, trampling, cutting, burning, etc). Reptiles and amphibians may be particularly at risk. Specific recommendations to ensure their well-being are available at:
http://web4.msue.msu.edu/mnfi/phragmites/herps-and-phragmites.cfm

Natural communities of Michigan's northern coastlines



Alvar

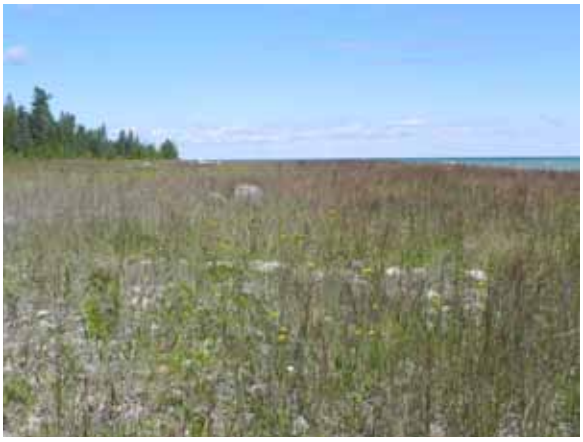


Alvar grasslands are open landscapes where grasses and sedges grow on flat limestone bedrock. Most trees are unable to survive because of thin soils and seasonal extremes such as spring flooding and summer drought. Alvar is among the rarest habitats in the world, known only from the Great Lakes, the Baltic region of Europe and northwestern Ireland. Many uncommon species occur in these grasslands, including species of the Arctic tundra and the Great Plains prairies. Rare species include dwarf lake iris (*Iris lacustris*), Houghton's goldenrod (*Solidago houghtonii*), and grizzled skipper (*Pyrgus wyandot*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Alvar.pdf

Coastal fen

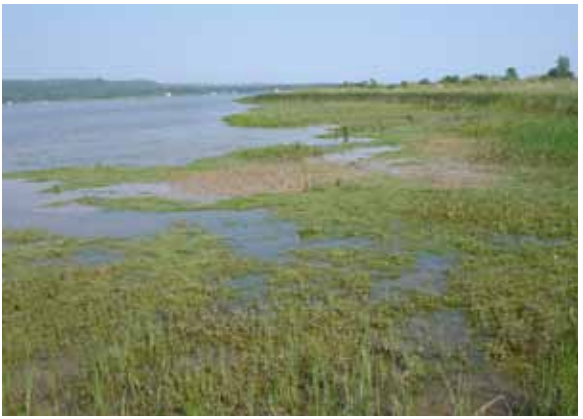


Coastal fen is a sedge- and rush-dominated wetland that occurs on calcareous substrates along Lake Huron and Lake Michigan north of the climatic tension zone. The community occurs where marl and organic soils accumulate in protected coves and abandoned coastal embayments. Rare species include Butterwort (*Pinguicula vulgaris*), Houghton's goldenrod (*Solidago houghtonii*), eastern flat-whorl (*Planogyra asteriscus*), and eastern box turtle (*Terrapene carolina carolina*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Coastal_Fen.pdf

Great Lakes marsh

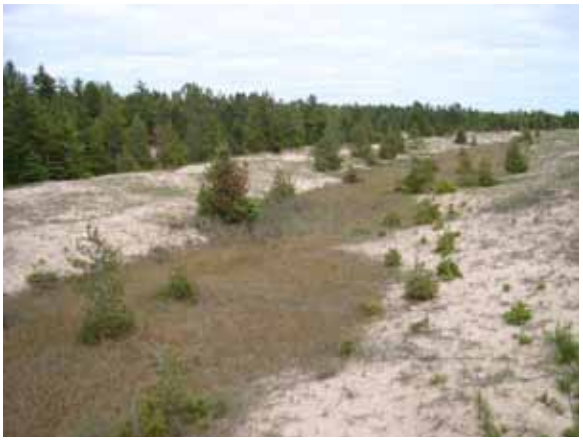


Great Lakes marshes occur along their shorelines and connecting channels. In the Straits region, they are found mostly in protected embayments and are characterized by grasses, sedges and rushes in the shallow waters at the lake edge. They provide important habitat for insects, fish, waterfowl, water birds and mammals. During spring migration, terrestrial migratory songbirds feed on midges as the insects mature and emerge from the water. Rare species include marsh wren (*Cistothorus palustris*) and common moorhen (*Gallinula chloropus*). In southern Michigan, many Great Lakes marshes in western Lake Erie, the St. Clair Delta and Saginaw Bay are now dominated by phragmites.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Great_lakes_marsh.pdf

Interdunal wetland

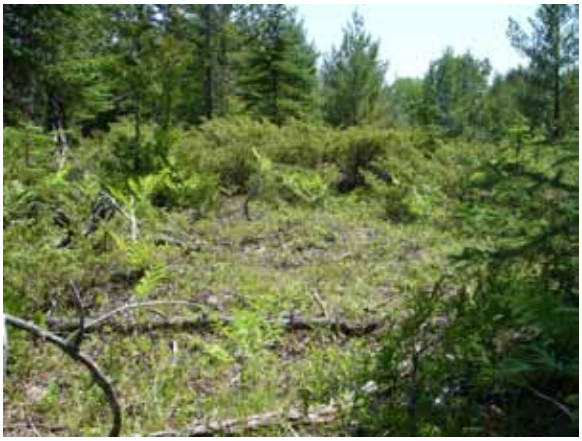


Interdunal wetlands occur between the sandy dune ridges. Water level in these swales is controlled by the Great Lakes near the shoreline and by groundwater flow farther inland. Vegetation is typically diverse, including aquatic or emergent grasses, sedges, herbs and shrubs. Inland swales are often forested. Rare species include Butterwort (*Pinguicula vulgaris*) and Houghton's goldenrod (*Solidago houghtonii*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Interdunal_wetland.pdf

Limestone bedrock glade

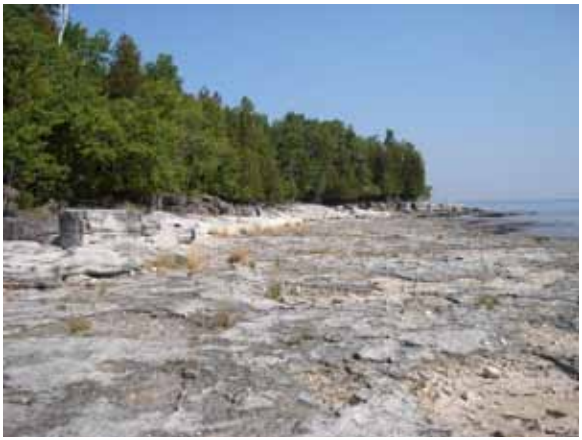


Limestone bedrock glade consists of an herb and graminoid-dominated plant community with scattered clumps of stunted trees and shrubs growing on thin soil over limestone or dolomite. Typically areas of bedrock are exposed. Mosses, lichens, and algae can be abundant on the exposed limestone bedrock or thin organic soils. Seasonal flooding and summer drought maintain the open conditions. These glades provide habitat for rare species including dwarf lake iris (*Iris lacustris*), butterwort (*Pinguicula vulgaris*), Houghton's goldenrod (*Solidago houghtonii*) and grizzled skipper (*Pyrgus wyandot*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Limestone_bedrock_glade.pdf

Limestone bedrock lakeshore



Limestone bedrock lakeshore is a sparsely vegetated natural community dominated by lichens, mosses, and herbaceous vegetation. This community, which is also referred to as alvar pavement and limestone pavement lakeshore, occurs along the shorelines of northern Lake Michigan and Lake Huron on broad, flat, expanses of limestone or dolomite bedrock. The bedrock includes both limestone and dolomite of marine origin and occurs where flat bedrock of the Niagaran Escarpment is exposed. Along the inland margins of the limestone pavement, there is often a low ridge of limestone cobble deposited by ice scour and major storm events. Rare species include dwarf lake iris (*Iris lacustris*), butterwort (*Pinguicula vulgaris*), and Houghton's goldenrod (*Solidago houghtonii*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Limestone_bedrock_lakeshore.pdf

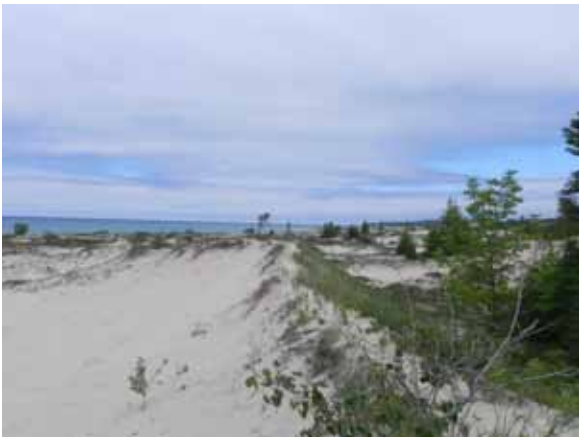
Northern fen

Northern fens are herbaceous wetlands that occur where limestone bedrock or cobble at or near the surface creates calcareous conditions. In the warm carbonate-saturated waters, algae precipitate calcium carbonate, often forming a whitish marl. A complex of calcium-loving plant species occur here, such as Kalm's lobelia, twig-rush, sweet gale and shrubby cinquefoil. Rare species include butterwort (*Pinguicula vulgaris*), Houghton's goldenrod (*Solidago houghtonii*), Eastern flat-whorl (*Planogyra asteriscus*), and Eastern box turtle (*Terrapene carolina carolina*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Northern_Fen.pdf

Open dunes



Open dunes are among the most rugged and beautiful natural features of the Lake Michigan shoreline. The sparse vegetation is exposed to abrasion and burial by windblown sand, extreme temperatures, and low moisture and nutrient levels. Pioneering grasses such as marram grass and sand reed occur here, along with other disturbance-tolerant species such as sand cherry, bearberry, and hairy puccoon. Rare species include Houghton's goldenrod (*Solidago houghtonii*), Lake Huron tansy (*Tanacetum huronense*), Pumpell's brome (*Bromus pumpellianus*), Pitcher's thistle (*Cirsium pitcheri*), stitchwort (*Stellaria longipes*), dwarf lake iris (*Iris lacustris*), Lake Huron locust (*Trimerotropis huroniana*), and piping plover (*Charadrius melodus*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Open_dunes.pdf

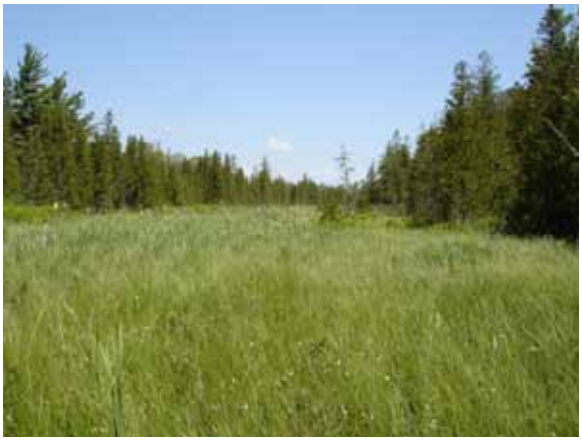
Sand and gravel beach

Sand and gravel beaches occur along the shorelines of the Great Lakes and on some of Michigan's larger freshwater lakes, where wind, waves, and winter ice cause the shoreline to be too unstable to support aquatic vegetation. Because of the high levels of disturbance, these beaches are typically quite open, with sand and gravel sediments and little or no vegetation. Rare species include Houghton's goldenrod (*Solidago houghtonii*), Lake Huron tansy (*Tanacetum huronense*), Pitcher's thistle (*Cirsium pitcheri*), dwarf lake iris (*Iris lacustris*), Lake Huron locust (*Trimerotropis huroniana*), and common tern (*Charadrius melodus*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Sand_and_gravel_beach.pdf

Wooded dune and swale



Wooded dune and swale complexes occur along embayments of the Great Lakes where gradually dropping lake levels and postglacial uplifting have formed a series of alternating sandy beach ridges with low, usually wet areas (swales). Typically, the inland ridges and swales are forested and those near the shoreline are open. This community is restricted to the Great Lakes shores. Rare species include Pitcher's thistle (*Cirsium pitcheri*), dwarf lake iris (*Iris lacustris*), and Lake Huron tansy (*Tanacetum huronense*).

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/ecology/Wooded_dune_and_swale_complex.pdf

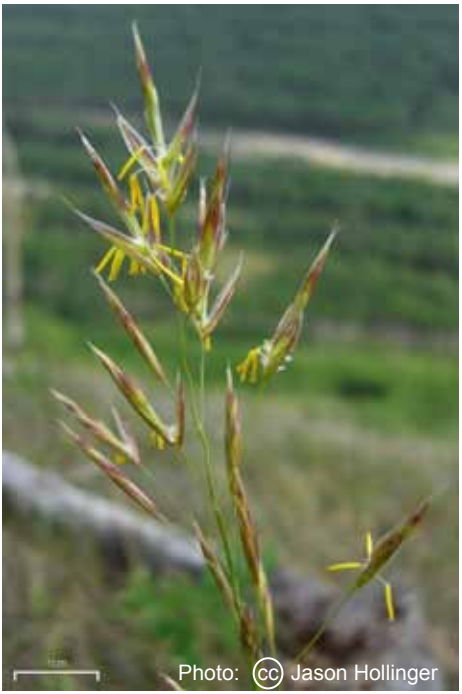
Rare plants of Michigan's northern coastlines

Pumpell's brome

Bromus pumpellianus

Status: Threatened

Global and state rank: G5T4/S2



Recognition

Pumpell's brome is a medium-sized grass of northern dunes, ranging from 0.5-1.0 m in height. Its leaves are hairy on the upper side, and its stem nodes also have long hairs. It has well-developed auricles at the top of the leaf sheath, which distinguish it from the related non-native species smooth brome (*B. inermis*).

Habitat

This rare grass grows on low sand dunes and along beaches in Lake Michigan usually in association with beach grass (Ammophila breviligulata), bearberry (*Arctostaphylos uva-ursi*), wormwood (*Artemisia caudata*) and Pitcher's thistle (*Cirsium pitcheri*). In its main range, to the west and north, *B. pumpellianus* habitat includes gravelly or sandy slopes, shores, and tundra. In Ontario, it inhabits sandy prairies and beaches, and is occasionally adventive along railroads on the north shore of Lake Superior.

Biology

Pumpelly's brome grass is a perennial,which spreads vegetatively via rhizome growth. Its spikelets mature from late June to September, though most collections have been made in July and early August.

Best Survey Time

Pumpelly's brome grass is best sought while in full fruit, typically during July and August. The characters for determination are rather subtle; thus attempts to distinguish this species during less optimal periods should occur only after considerable experience with the species.

Management Concerns

This grass is vulnerable to heavy recreational use and residential development, though it can tolerate some disturbance. Remove invasive species such as phragmites, spotted knapweed and baby's breath where they have invaded. When using herbicide, hand swipe invasives near Pumpell's brome.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/botany/Bromus_pumpellianus.pdf

Pitcher's Thistle

Cirsium pitcheri

Status: US & State Threatened
Global and state rank: G3/S3


Photo: Susan R. Crispin

Recognition

Pitcher's thistle is stout and prickly and may reach 3 feet (1 m) or more in height. Stunted individuals may be smaller. The leaves, stems and bases of the flowers are blue-green and densely covered with white-woolly hairs. The deeply divided mature leaves have narrow, spine-tipped segments. The prickly, spine-tipped flower heads are relatively large. They are usually cream-colored but may occasionally have a pinkish tinge. They can be readily distinguished from other thistle species, which have pink flowers and lack woolly, white hairs.

Habitat

Pitcher's thistle typically grows on open sand dunes and occasionally on gravel associated with dunes. It is found along Great Lakes shorelines or nearby.

Biology

Pitcher's thistle flowers only once but may exist as a vigorous basal rosette for 5 to 8 years before it flowers. A diverse selection of insects pollinates it including bees, skippers and butterflies. Because Pitcher's thistle dies after flowering, mowing before it has set seed may harm the local population. Goldfinches, sparrows and ground squirrels eat its seed. Pitcher's thistle is extremely low in genetic diversity.

Best Survey Time

It is best to survey for Pitcher's thistle while it is flowering and fruiting from late June through early September. Experts can distinguish its seedlings early in the season.

Management Concerns

Preserve dune habitat and the natural processes that maintain it. Stabilizing structures such as retaining walls, revetments and riprap disrupt these processes. Remove invasive species such as phragmites, spotted knapweed and baby's breath where they have invaded. When using herbicide, hand swipe invasives near Pitcher's thistle.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/botany/Cirsium_hillii.pdf

Dwarf Lake Iris

Iris lacustris

Status: US & State Threatened

Global and state rank: G3/S3


Photo: Thomas Arter

Recognition

Dwarf lake iris is a miniature iris. Its flower is 3 inches (7.5 cm) across and 3 inches tall. Its flattened leaves are 6 inches tall (15 cm), .4 -.8 inches wide (1-2 cm) and arranged in fans. The deep blue flower has three petal-like sepals with orange bearded crests. Its sepals lie below the smaller petal-like style branches and alternate with the three petals.

Habitat

Dwarf lake iris usually occurs near Great Lakes shorelines. Suitable soil types include sand, thin soils over calcareous bedrock and alvar. It can tolerate full sun or some shade. The iris flowers best in semi-open settings, among scattered trees or along forest margins. It is usually associated with northern white cedar.

Biology

Dwarf lake iris is a perennial, which grows from a slender rhizome. Fertility in the species is low because of sparse flower production, low fruit set and low seed set. Plants reproduce readily by rhizome forking and elongation.
Extensive clones often form but may only represent one or a few genetically distinct individuals.

Best Survey Time

Dwarf lake iris flowers between mid-May and early June. Each flower remains open about 3 days. Surveys are most effective when flowers are present. Foliage is distinctive throughout the season and is sufficient for plant identification.

Management Concerns

Dwarf lake iris requires protection of its habitat, natural disturbance and hydrological regimes. Thriving colonies do not require active management. It can withstand light trampling, loss of overstory and shading. It is sensitive to mechanical disturbance and substrate removal. Remove invasive species such as phragmites, spotted knapweed and baby's breath where they have invaded. When using herbicide, hand swipe invasives near dwarf lake iris.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/botany/Iris_lacustris.pdf

Butterwort

Pinguicula vulgaris

Status: State Special Concern
Global and state rank: G5/S3


Photo: Susan R. Crispin

Recognition

Butterwort is easily recognized by its distinctive yellowish-green basal rosette, which is about 3 inches (8 cm) across. It has a solitary spurred violet flower on a .6-4.7 inch (1.5-12 cm) stem but a single rosette may produce up to nine stems.

Habitat

Butterwort is circumboreal and occurs in a variety of habitats throughout its range. In Michigan, butterwort occurs in sandy wet depressions along Great Lakes dunes, on cobbly-marly shores, especially in the eastern Upper Peninsula, in northern fens, and on alkaline bedrock shores of the western Upper Peninsula. It prefers open, sunny sites.

Biology

Butterwort, a calciphile, is an insectivorous perennial that grows from a distinctive basal rosette. Its leaves have a greasy, butter-like feel and are used to trap insects by curling their margins inward. The leaves have two kinds of glands. Stalked glands produce a sticky substance that traps the insect. Sessile (without stalks) glands secrete enzymes that digest the insects. The insects provide phosphorus for the plant. In winter, leaves die back and a winter bud is formed.

Best Survey Time

In Michigan, butterwort blooms in July and August but its basal rosette can be recognized any time that the plant is above ground.

Management Concerns

Butterwort is vulnerable to foot and vehicular traffic. Protect it by preserving the site hydrology and habitats in which it occurs. Do not trample the site during routine maintenance and construction activities or stockpile materials within the protected area. Remove invasive species such as phragmites, spotted knapweed and baby's breath where they have invaded. When using herbicide, hand swipe invasives near butterwort.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/botany/Pinguicula_vulgaris.pdf

Houghton's Goldenrod

Solidago houghtonii

Status: US & State Threatened
Global and state rank: G3/S2S3

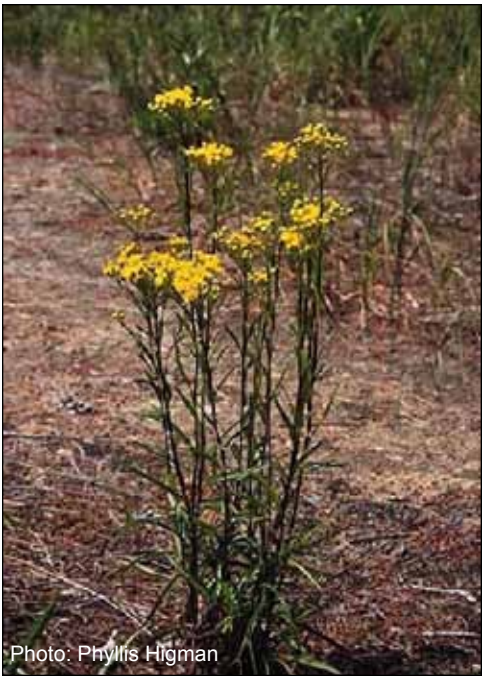


Photo: Phyllis Higman

Recognition

Houghton's goldenrod can grow up to 24 inches (60 cm) tall. Its flat-topped, branched inflorescence consists of relatively few (5-30), showy, yellow flower heads with relatively large ray flowers. The scattered narrow leaves have slightly clasping bases and are often folded along the midrib. Unlike the similar grass-leaved goldenrod, its basal leaves are present at flowering. Stems are smooth and sometimes reddish. The inflorescence branches and flower bases are finely hairy with fine, upcurving hairs. This distinguishes it from Ohio goldenrod, which is smooth.

Habitat

Houghton's goldenrod occurs on the northern shores of Lakes Michigan and Huron, on calcareous beaches, rocky and cobble shores and beach flats. It is most commonly found in shallow, trough-like interdunal depressions that parallel shoreline areas. It can also occur on seasonally wet limestone pavement.

Biology

Houghton's goldenrod is a perennial, often forming small clumps. Short underground stems produce the clumps vegetatively. It is considered an obligate wetland species.

Best Survey Time

Houghton's goldenrod can be identified most readily when it is in bloom. Peak bloom is from early August through early Septemberor even October.

Management Concerns

Houghton's goldenrod requires protection of its habitat and the maintenance of natural processes. These processes include shoreline fluctuation, erosion, sand deposition, water level fluctuation and sand movement. Do not trample the site or stockpile materials within the protected area. Remove invasive species such as phragmites, spotted knapweed and baby's breath where they have invaded. When using herbicide, hand swipe invasives near Houghton's goldenrod.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/botany/Solidago_houghtonii.pdf

Stitchwort

Stellaria longipes

Status: State Special Concern
Global and state rank: G5/S2


Photo: Susan R. Crispin

Recognition

Stitchwort ranges from 1 to 8 inches (3-20 cm) in height. Its stiff, shiny leaves are narrow, opposite and strongly keeled. Flowers may be solitary or in inflorescences of up to six flowers. Its five white deeply cleft petals appear to be 10 at first glance. Its 10 stamens are bright red until they have been pollinated. Its fruit is a dry capsule with the calyx persisting.

Habitat

In Michigan, stitchwort usually grows on dunes and sandy beaches, although it occupies a variety of other habitats elsewhere. Its distribution is circumpolar and most of its range is north of the state. Outside of Michigan, it occurs in wet meadows, on river terraces, tundra, floodplains and seepage slopes.

Biology

Stitchwort is a perennial and is considered an obligate wetland species. It reproduces by seed and vegetatively by stem fragmentation or bulbils.

Best Survey Time

Stitchwort is most readily identified in flower, but its shiny, purple-black seed capsules are also distinctive.

Management Concerns

Stitchwort requires protection of habitat and maintenance of natural dune processes (e.g. shoreline fluctuation, erosion, sand deposition, wind, water level fluctuation, sand movement). Where invasive species are present, control measures should be initiated. Stitchwort is vulnerable to vehicular and foot traffic. Do not trample the site during routine maintenance and construction activities or stockpile materials within this area. Remove invasive species such as phragmites, spotted knapweed and baby's breath where they have invaded. When using herbicide, hand swipe invasives near Stitchwort.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/botany/Stellaria_longipes.pdf

Lake Huron Tansy

Tanacetum huronense

Status: US & State Threatened
Global and state rank: G4Q/S3

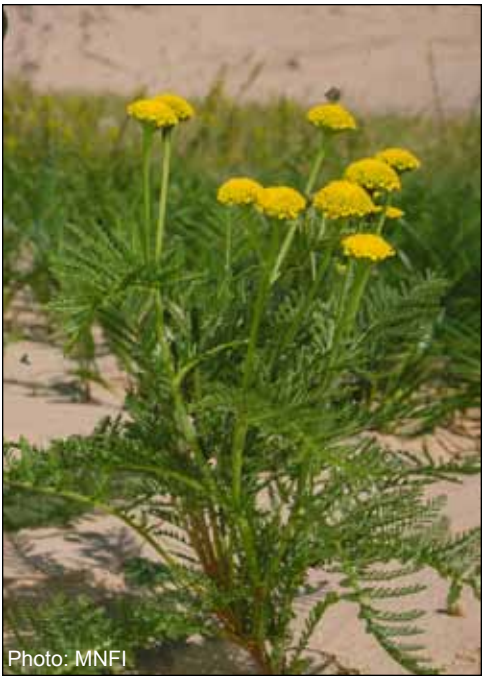


Photo: MNFI

Recognition

Lake Huron tansy can reach up to 31 inches (80 cm) in height. It has a "daisy type" flower head that is .5-.75 inches (13-19 mm) in diameter, composed of numerous small yellow flowers. Two sorts of flowers are found on each head. Disk flowers make up the larger central portion and ray flowers form a fringe of petals around the periphery. Each stem holds 3-12 heads and plants can have 1-3 main stems. The finely divided leaves are hairy and dotted with inconspicuous glands.

Habitat

Lake Huron Tansy occurs in active dunes, older stabilized dunes and sandy or cobble beaches. During periods of high water, it can withstand wave action.

Biology

Lake Huron tansy is a perennial that uses two strategies for reproduction in the fluctuating conditions of the shoreline. It forms colonies through spreading rhizomes and produces abundant quantities of seed.

Best Survey Time

Lake Huron tansy is recognized most easily when in bloom from late June through August but experts can identify it by its hairy foliage whenever leaves are present.

Management Concerns

Lake Huron tansy depends on the maintenance of its habitat and natural processes along the shoreline. Stabilizing structures such as retaining walls, revetments and riprap disrupt these processes. Coastal dunes have been invaded by a number of introduced species including spotted knapweed and baby's breath, which present an additional threat. Remove these and other invasive species whenever present. Do not trample the site or stockpile materials within the protected area. Remove invasive species such as phragmites, spotted knapweed and baby's breath where they have invaded. When using herbicide, hand swipe invasives near Lake Huron tansy.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/botany/Tanacetum_huronense.pdf

Rare animals of Michigan's northern coastlines

Piping Plover

Charadrius melodus

Status: US & State Endangered
Global and state rank: G3/S1

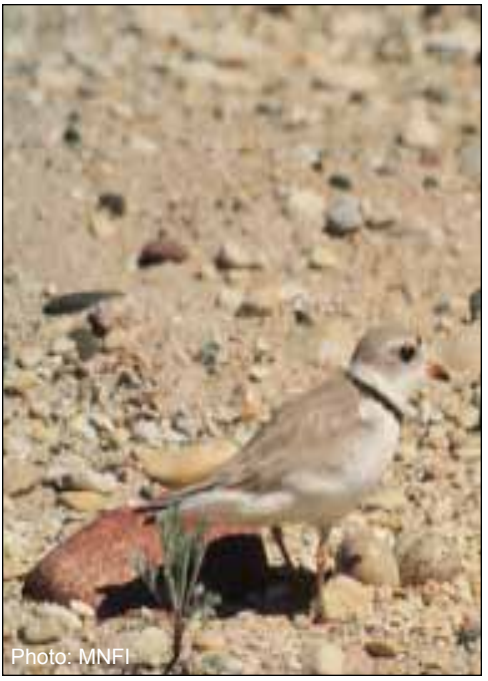


Photo: MNFI

Recognition

The piping plover is a small wading bird with a black bar across its forehead and a single black band around its neck. It has a pale, sand colored back and head, white under parts and orange legs. The plovers are 7 inches (18 cm) long, with a 15 inch (38 cm) wingspan. They have a distinctive two-noted "peep-lo" melodious whistle.

Habitat

Piping plovers make their nests on sparsely vegetated sand or pebble beaches. Foraging areas such as beach pools and interdunal swales can be critical to their survival and may directly affect nesting success. Nests are located between the waters' edge and the first dune or in the cobble pan behind the first dune.

Biology

Piping plovers reach the nesting ground in late April or early May. Courtship includes aerial displays and nest preparation. The nest is a simple scrape in the sand or gravel substrate. Typically, four eggs are laid and are incubated for 28 days. The young are precocial and are able to walk around and forage near their parents shortly after hatching. Piping plovers leave the state between mid July and early September.

Best Survey Time

Piping plovers are resident in Michigan from late April through early September but are most easily surveyed during courtship and nesting in May and June.

Management Concerns

Maintenance activities should be scheduled outside of the courtship and breeding season, which extends from May through early August. Ideally, any human activity should be eliminated around the nest during this period. Fencing may be appropriate around active nest sites when the potential for predation or disturbance by pets is high but is coordinated by USFWS.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/zoology/Charadrius_melodus.pdf

Marsh wren

Cistothorus palustris

Status: State Special Concern
Global and state rank: G5/S3S4

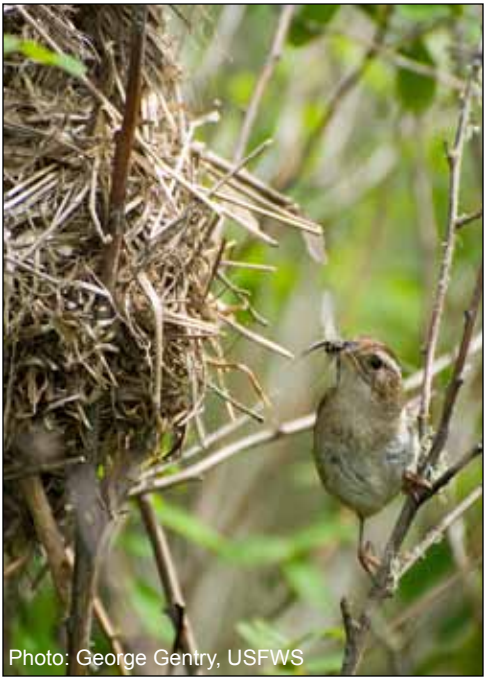


Photo: George Gentry, USFWS

Recognition

The Marsh wren is a quick little bird with black and white streaks on its back, a brown cap and a broad white eyeline with a black stripe above. The wren is stocky with a long narrow bill. Its rump is a bright dark red, its throat and breast are pale and its flanks are reddish. It sings a gurgling song in the breeding season.

Habitat

The ideal habitat for the Marsh Wren is narrow-leafed cattail and cord-grass marshes. Nest placement over standing water in dense cattail is preferred. It is found in Great lakes marsh, emergent marsh and coastal plain marsh

Biology

Marsh wrens typically arrive in the Lower Peninsula in late April or early May and reach the Upper Peninsula by mid May. They are polygynous, with most males mating with 1 – 3 females. Nests are domed structures built of cattail, sedge, or grass supported by several stems in tall vegetation over water. This species typically double broods and three broods are sometimes produced. Marsh wrens leave the state by late August or September.

Best Survey Time

Surveys for marsh wrens are best done during the breeding season from May through July, when males are territorial and conspicuous singers. Males are especially vocal during the early morning, but may sing day or night

Management Concerns

Wetland loss and degradation caused by drainage, filling, other human disturbances, and invasive species continue to threaten habitats used by this species. The invasive European subspecies of phragmites may reduce biodiversity and impair wetland functions, and could impact marsh birds through changes in the physical structure and food resources.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/zoology/Cistothorus_palustris.pdf

Common moorhen

Gallinula chloropus

Status: State Threatened
Global and state rank: G5/S3

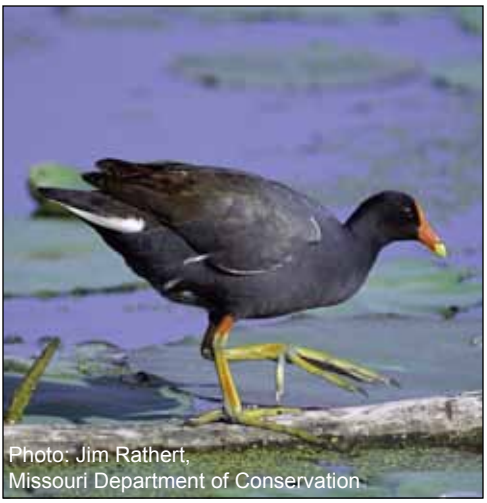


Photo: Jim Rathert,
Missouri Department of Conservation

Recognition

The common moorhen is a duck-like birds with a dark body, a white undertail, and white flank stripes. Perhaps the most conspicuous characteristic is its red-orange bill and forehead shield with a yellow tip.

Habitat

Common moorhens require a diverse mosaic of emergent marsh known as a hemi-marsh; a 50:50 mix of emergent vegetation and open water that are well interspersed. Specific habitats where they may be found include Great lakes marsh, coastal plain marsh and emergent marsh.

Biology

Moorhens arrive in Michigan between the third week of March and the fourth week of April. They nest in dense emergent vegetation over water 1 to 4 feet deep. Typically, nesting takes place from the first week of May to third week of July. Fall migration occurs from the first week of September to the third week of November.

Best Survey Time

Moorhens are most readily observed between the first week of May through the second week of July. Call playback may be helpful in detecting birds hiding in vegetation.

Management Concerns

Maintaining a diverse mix of open marsh and emergent vegetation is critical. Invasive species such as the Eurasian subspecies of phragmites, that fill in open areas and form a monoculture pose a particular threat and should be removed. Be sure to flush area prior to spraying with herbicide, as birds may be present in dense vegetation.

Additional information

http://web4.msue.msu.edu/mnfi/explorer/species.cfm?id=10971

Eastern Flat-whorl

Planogyra asteriscus

Status: State Special Concern
Global and state rank: G3G4/S3

Photo: Matthew Barthel and Jeffery C. Nekola

Recognition

Easternflat-whorl is a tiny, thin-shelled, brownish land snail. Its shape is a flattened spiral only 1.8 mm across and .9 mm deep. It has thin ribs with distinct, sharp edges. Its opening, or peristome is unflared and unthickened.

Habitat

Easternflat-whorl occurs on moist shaded calcareous outcrops with white cedar and tamarack wetlands with alder, a thick sedge turf and no sphagnum.

Biology

Very little is known about the biology of Easternflat-whorl but like all land snails in the subclass Pulmonata, it has modified mantle tissue and a mantle cavity that act like a lung for breathing air. All pulmonates are hermaphroditic, a feature that is useful in organisms that travel such short distances.

Best Survey Time

Snails do not move far and their shells are present year round but surveying can be a complex task. Larger (or less miniscule) snails may be collected by hand but normally leaf litter and turf are collected in the field and then dried in a low temperature soil oven for further examination by experts.

Management Concerns

Land snails are extremely vulnerable to both foot and vehicular traffic. Construction vehicles and ATVs pose a particular threat. They are also vulnerable to changes in hydrology. Land snails require an organic litter layer in both forested and grassland habitats. The use of prescribed fire, which removes this layer, reduces snail abundance by 50% - 90% and species diversity by 30%. Old growth forests have the highest snail abundance and diversity and should be preserved.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/zoology/Planogyra_asteriscus.pdf

Grizzled Skipper

Pyrgus wyandot

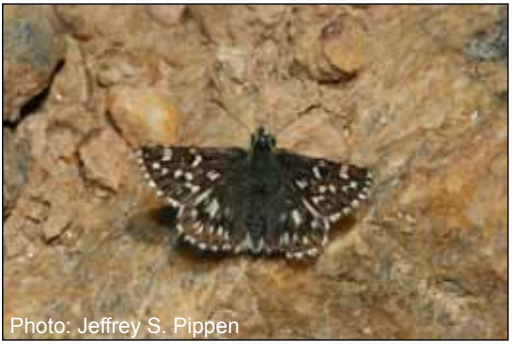


Photo: Jeffrey S. Pippen

Status: State Special Concern
Global and state rank: G1G2Q/S1S2

Recognition

The Appalachian grizzled skipper is a small, grayish-black skipper with a wingspan ranging from 1.1-1.3 inches (2.9-3.3 cm). It has white markings on the upper side of its wings, with black and white checkered fringes along the margins. Its underside is checkered in white and grayish brown.

Habitat

In Michigan, the Appalachian grizzled skipper occurs in alvar, oak-pine barrens, or other sparsely grassed areas within 97 feet (30 meters) of oak or pine forest.

Biology

Dwarf cinquefoil and several other members of the rose family have been reported as the larval foodplant for this species. In Michigan, butterflies lay eggs on wild strawberry, another rose family member, although it is not clear if the plant serves as a larval food source. The larvae overwinter in leafy nests. Adults have been observed nectaring on bearberry, blueberry, wild strawberry and birdsfoot violet.

Best Survey Time

The Appalachian grizzled skipper is best surveyed while adults are in flight, from late April through mid-May.

Management Concerns

Preserve the Appalachian grizzled skipper by protecting its alvar and barrens habitats. Although this habitat was historically maintained by fire, the skipper is vulnerable in all stages of its life cycle. If prescribed fire is used as a management tool, only a small portion of the occupied habitat should be burned in any given year. Mechanical removal of encroaching woody vegetation may be beneficial. Where host plant is present, assume that the skipper may be present, also, if previously recorded from the site and proceed with caution.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/zoology/Pyrgus_wyandot.pdf

Common Tern

Sterna hirundo

Status: State Threatened
Global and state rank: G5/S2

Recognition

Common terns have a slender body, long, pointed wings and a deeply forked tail. During the breeding season, adults have a black-tipped red bill, a black crown and red legs. Wintering adults have a black nape and a dark bill. With a wingspan of 31 inches, they are smaller than the similar Caspian tern and their dark-tipped wings and redder bill distinguish them from the Forster's tern.

Habitat

Historically, common tern colonies occurred on sparsely vegetated sand and gravel beaches on islands and peninsulas. Currently, artificial islands created of dredge spoils provide nesting habitat as well.

Biology

Common terns begin returning to Michigan breeding grounds in mid-April. They nest in large colonies where they cooperate to defend against competitors and predators. Nests are on the ground and vary in complexity. The nests are usually associated with low herbaceous vegetation and driftwood. They leave for the wintering grounds from late August through October.

Best Survey Time

Common terns are best surveyed during the nesting period and while they are rearing young, from May through July.

Management Concerns

Maintenance activities such as mowing or grading should be scheduled outside of the nesting season, which runs from May through mid July. In areas that are succeeding to closed vegetation, fire may be a useful management tool in restoring tern habitat but again, must be scheduled outside of the breeding season. Control of predators may be a crucial factor in maintaining tern populations. Roadside features that may be attractive to raccoons, etc., such as rest stops or overlooks with refuse containers should not be located near tern colonies. Remove invasive species such as phragmites that alter the structure of their coastal habitat.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/zoology/Sterna_hirundo.pdf

Eastern Box Turtle

Terrapene carolina carolina

Status: State Special Concern
Global and state rank: G5T5/S2S3

Recognition

The eastern box turtle is a small land turtle with a high-domed upper shell. It has a hinge in the middle of its lower shell so it can close up tightly like a box. The upper shell ranges from 4.6 to 7.8 inches long and is dark with yellow markings. Eastern box turtles have four toes on each hind foot and a short tail.

Habitat

The eastern box turtle is Michigan's only truly terrestrial turtle. It lives in forests with sandy soils and nearby ponds, streams, marshes or lakes. They can also be found in thickets, old fields, pastures, vegetated dunes and marshes. They need access to sunny nesting sites in sandy open areas in order to reproduce successfully.

Biology

Turtles emerge from hibernation in April and usually mate shortly afterwards. Females lay their eggs from early June until the middle of July. The eggs hatch after 50 to 90 days. Hatchlings emerge from their eggs in September or October but spend most of their time hiding under forest debris. When cool weather begins in fall, box turtles dig into the soil, digging deeper as temperatures decline. Some turtles move about in winter during warm spells.

Best Survey Time

Box turtles are diurnal and most active in the spring and fall, particularly in the morning following rain showers.

Management concerns

Protect box turtles by preserving their woodland and wetland habitat. Continued fragmentation of remaining turtle habitat increases their vulnerability to road mortality. New roads should be sited to avoid separating the turtle's habitat from nesting areas whenever possible. Avoid mowing and other routine maintenance tasks between April and July, when turtles are most active. When possible, schedule routine maintenance between November and March. Remove invasive species such as phragmites that alter the structure of their wetland habitat.

Abstract

http://web4.msue.msu.edu/mnfi/abstracts/zoology/Terrapene_carolina.pdf

Lake Huron Locust

Trimerotropis huroniana

Status: State Threatened
Global and state rank: G2G3/S2S3


Photo: David Cuthrell

Recognition

The Lake Huron locust is a small, band-winged grasshopper. Its body is usually silvery to ash gray, with darker brown and white markings. Males' folded forewings range from 1 to 1.24 inches (24-30 mm) in length. Females' forewings are a bit larger. The toughened forewings of adults have darker bands that may be weak or strong. The hindwings are light yellow near the body with a smoky patch near the tip.

Habitat

In Michigan, the Lake Huron locust is restricted to sparsely vegetated, high-quality coastal sand dunes. Where the open dunes grade into heavily vegetated or disturbed areas, locust numbers quickly decline.

Biology

The Lake Huron locust has a single generation each year and lays its egg masses in the soft soil where they overwinter. Nymphs hatch in late spring and mature by mid-July. Adults may be found in large numbers through fall, until they are killed by the frost. They are strictly ground-dwelling and do not climb on vegetation or other supports.

Best Survey Time

Adult locusts can be found from late July through October. They become active between 9:30 and 10:00 a.m., after the sun has risen far enough to warm the sands.

Management Concerns

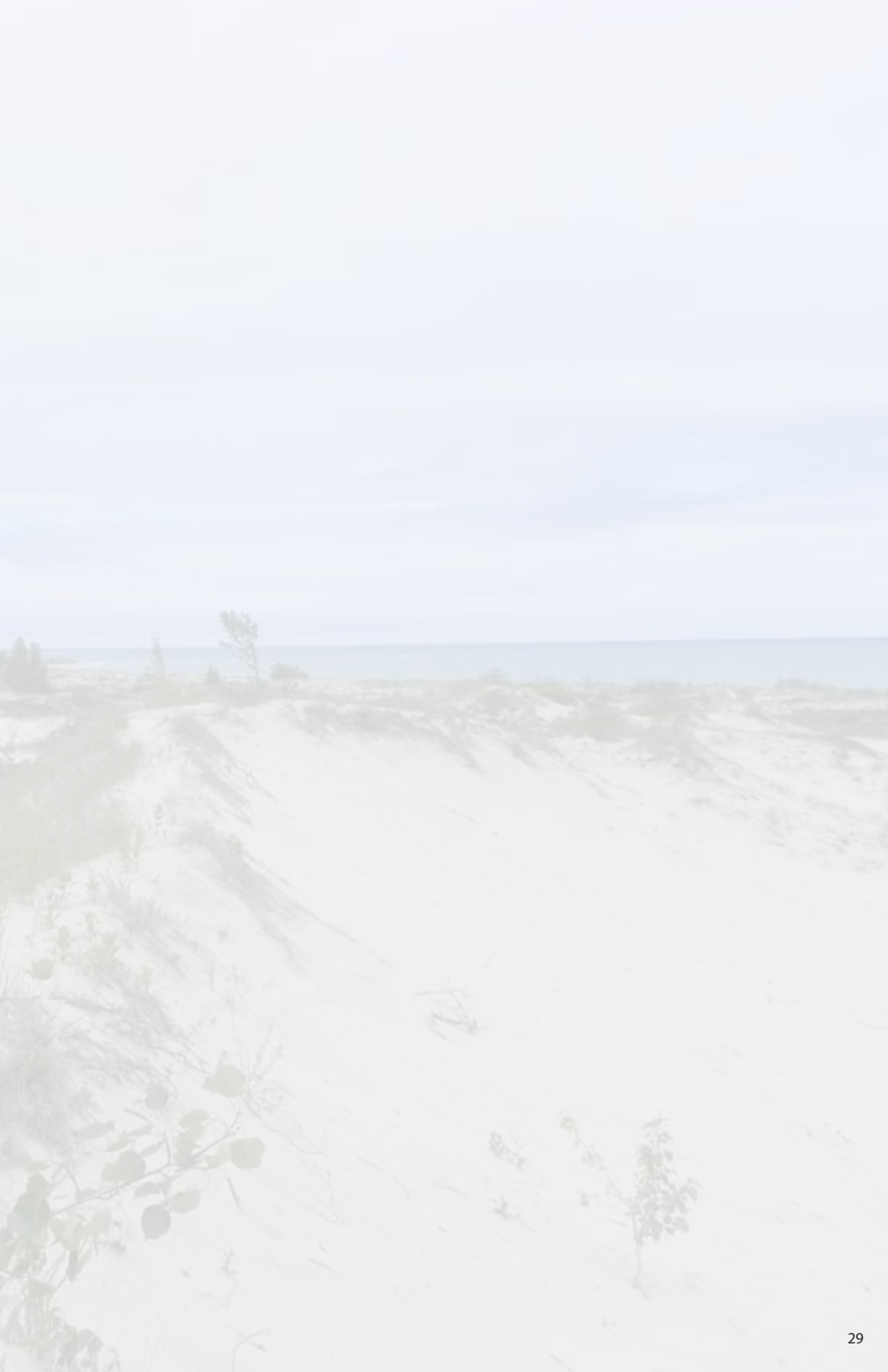
Lake Huron locust management should focus on preserving its habitat and the natural processes that maintain the dunes it inhabits. Stabilizing structures such as retaining walls, revetments and rip rap disrupt these processes along with more obvious sources of habitat destruction such as beach grooming and shoreline development. Where invasive species such as phragmites, spotted knapweed or baby's-breath limit sand movement, institute control measures.

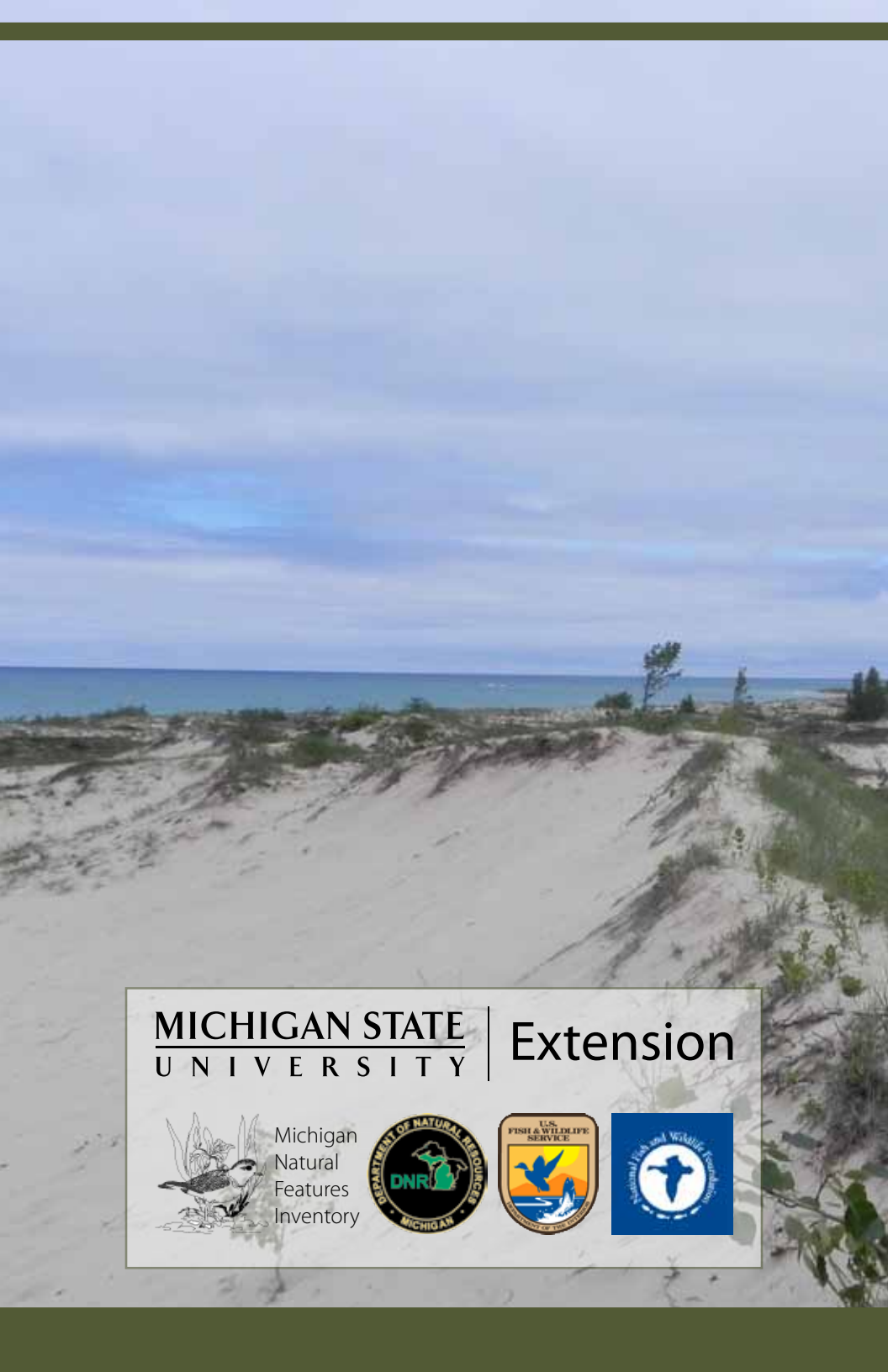
Abstract

http://web4.msue.msu.edu/mnfi/abstracts/zoology/Trimerotropis_huroniana.pdf

Rare species by natural community type

Species	Alvar	Coastal fen	Great Lakes marsh	Interdunal wetland	Limestone bedrock glade	Limestone bedrock shoreline	Northern fen	Open dunes	Sand and gravel beach	Wooded dune and swale
Plants										
Pumpell's brome *Bromus pumpellianus*								■	■	
Pitcher's thistle *Cirsium pitcheri*								■	■	■
Dwarf lake iris *Iris lacustris*	■	■			■	■			■	■
Butterwort *Pinguicula vulgaris*		■		■	■	■	■			
Houghton's goldenrod *Solidago houghtonii*	■	■		■	■		■	■	■	
Stichwort *Stellaria longipes*								■		
Lake Huron tansy *Tanacetum bipinnatum*								■	■	■
Animals										
Piping plover *Charadrius melodus*								■	■	
Marsh wren *Cistothorus palustris*			■							
Common moorhen *Gallinula chloropus*			■							
Eastern flat-whorl *Planogyra asteriscus*		■					■			
Grizzled skipper *Pyrgus wyandot*	■									
Common tern *Sterna hirundo*									■	
Eastern box turtle *Terrapene carolina carolina*		■	■				■			
Lake Huron locust *Trimerotropis huroniana*								■		





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Michigan Natural Features Inventory